Morven North Offshore Wind Array Project

Environmental Impact Assessment Report

Volume 2, Chapter 19: Major Accidents and Disasters

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19.1 Introduction

19.1.1.1 This chapter of the Morven North Offshore Wind Array Project (hereafter 'Morven North') Environmental Impact Assessment (EIA) Report (hereafter, the EIA Report) presents the assessment of the likely significant effects (LSE[1]) (as per the EIA Regulations as defined in Volume 1, Chapter 2: Policy and Legislation) on major accidents and disasters. Specifically, this chapter considers the potential impacts of Morven North seaward of Mean High Water Springs (MHWS) during the construction, Operations and Maintenance (O&M) and decommissioning phases. Where relevant, this chapter also assesses the LSE[1] of Morven North on receptors landward of Mean Low Water Springs (MLWS) during the construction, O&M and decommissioning phases.

19.1.1.2 The assessment presented in this chapter has relied upon, or informed the following technical chapters:

- Volume 2, Chapter 12: Commercial Fisheries;
- Volume 2, Chapter 13: Shipping and Navigation;
- Volume 2, Chapter 15: Aviation (Military and Civil);
- Volume 2, Chapter 16: Other Sea Users and Communications;
- Volume 2, Chapter 18: Climate Change.

19.1.1.3 The structure of the Major Accidents and Disasters chapter within the Morven North EIA Report differs from that of the other technical chapters, as its assessment follows the guidance set out in the Institute of Sustainability and Environmental Professionals (ISEP) (formerly Institute of Environmental Management and Assessment (IEMA)) proforma 'Major Accidents and Disasters in EIA: A Primer' (IEMA, 2020). In line with this proforma:

- a 'major accident' is a serious event (e.g. train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare and/or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e. contractors) to manage. Major accidents can be caused by disasters resulting from both man-made and natural hazards;
- a 'disaster' is a man-made/external hazard (e.g. an act of terrorism) or a natural hazard (e.g. an earthquake) with the potential to cause an event or situation that meets the definition of a 'Major Accident' detailed above;
- a 'significant effect' in relation to major accidents and disasters could involve loss of life, permanent injury, or the temporary or permanent damage to an environmental receptor, where recovery is not achievable through minor clean-up or restoration measures.

19.1.1.4 The Morven North EIA Report delivers Scottish Ministers, as well as statutory and non-statutory stakeholders, the necessary information to assess the LSE[1] of Morven North on the surrounding environment, as detailed further in Volume 1, Chapter 1: Introduction.

19.1.1.5 This Morven North Major Accidents and Disasters EIA chapter:

- outlines the current environmental baseline, derived from desk-based research and consultation with stakeholders;
- highlights any assumptions made and limitations encountered during the compilation of environmental data;
- describes the anticipated LSE[1] arising from Morven North's vulnerability to existing major accidents and disasters and potential to cause a major accident and disaster, based on the collected data and the analyses conducted;
- details the recommended designed-in measures and mitigation intended to prevent, minimise, or offset the likely significant adverse environmental effects of Morven North in relation to major accidents and disasters.

19.1.1.6 Major accidents and disasters was reported on in the Scoping Report for the Morven Option Lease Agreement Site (hereafter, 'the Morven Site Scoping Report') (Morven Offshore Wind Limited (MvOWL), 2023). As described in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives, the Morven Option Lease Agreement Site (hereafter 'Morven Site') has since been divided into two projects, Morven North and Morven South.

19.1.1.7 The potential impacts to major accidents and disasters are considered to generally be the same (or less) for Morven North as identified in the Morven Site Scoping Report. Although it was reported that all potential risk events were scoped out in the Morven Site Scoping Report, an evaluation of all potential risk events has been re-assessed for major accidents and disasters. The advice provided by the Marine Directorate Licensing Operations Team (MD-LOT) in the Morven Site Scoping Opinion (MD-LOT, 2023) relevant to Morven North, has therefore been considered for the development of this chapter.

19.1.1.8 This chapter presents and assesses up-to-date parameters for Morven North and explains if and how any assessment aspects differ from the information set out in the Morven Site Scoping Report.

19.2 Study areas

19.2.1.1 One study area has been defined for major accidents and disasters:

- The Morven North Offshore Wind Array Project Major Accidents and Disasters Study Area (hereafter the 'Morven North Major Accidents and Disasters Study Area').

19.2.1.2 Morven North will be located approximately 61km from the Aberdeenshire coast off the east coast of Scotland and will cover an area of 511.1km^2. Additional information regarding Morven North and its location can be found in Volume 1, Chapter 3: Project Description. The Morven North Major Accidents and Disasters Study Area includes potential hazards that may be relevant to:

- The Morven North Boundary (i.e. the area in which the wind turbines and foundations, Offshore Substation Platforms (OSPs) and foundations, inter-array cables and interconnector cables and associated infrastructure will be located);
- Baseline information drawn from specific technical topics included within the Morven North EIA Report listed in paragraph 19.1.1.2.

19.2.1.3 The United Kingdom (UK) has also been considered to identify any national-level hazards that may be relevant to Morven North. The Study Areas for the topics relevant to major accidents and disasters listed in paragraph 19.1.1.2 differ from each other due to the varying ranges of different receptors for which impacts must be considered. However, despite these differences, all relevant Study Areas are appropriate for the consideration of major accidents and disasters.

19.2.1.4 The study area for major accidents and disasters for the Morven Site was presented and agreed during the Scoping process for the Morven Site. The underlying principles used to define the Morven North Major Accidents and Disasters Study Area have not changed, other than the limits have been applied relative to the Morven North boundary, rather than the Morven Site boundary. The Study Area for the topics that major accidents and disasters considers was presented to and confirmed by MD-LOT via a 'Targeted Consultation Exercise' undertaken in Quarter 1, 2025 and as detailed in Table 19.8.

19.3 Legislative and policy context

19.3.1.1 Policy and legislation on renewable energy infrastructure is presented in Volume 1, Chapter 2: Policy and Legislation. Policy and legislation specific to major accidents and disasters is contained in the EIA Regulations, Health and Safety at Work etc. Act 1974 (HSWA) and Regulations made thereunder (HM Government, 1974), Construction Design and Management (CDM) 2015 Regulations (HM Government, 2015a), Control of Major Accident Hazards (COMAH) Regulations 2015 (HM Government, 2015b), and the Scotland's National Marine Plan (NMP) (Marine Scotland, 2015), UK Marine Policy Statement (MPS) (HM Government, 2011), and the National Planning Framework (NPF) 4 (Scottish Government, 2024b). A summary of the legislative provisions relevant to major accidents and disasters are provided in Table 19.1 to Table 19.4 below, with other relevant policy provisions set out in Table 19.5 to Table 19.7.

Table 19.1: Summary of provisions within the Environmental Impact Assessment Regulations of relevance to major accidents and disasters

Summary of relevant legislation	How and where considered in the EIA report
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 4 (2) of the Electricity Works (Environmental Impact Assessment) Regulations (Scotland) 2017 outlines receptors that "the EIA must identify, describe and assess in an appropriate manner, in light of the circumstances relating to the proposed development, the direct and indirect significant effects of the proposed development" and this includes major accidents and disasters. Regulation 4 (4) of the Electricity Works (Environmental Impact Assessment) Regulations (Scotland) 2017 outlines the requirement for "The effects to be identified, described and assessed…include the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and disasters". 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 a high-level description 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 19.9.

Table 19.2: Summary of provisions within Health and Safety at Work Act and Regulations Made Thereunder of relevance to major accidents and disasters

Summary of relevant legislation	How and where considered in the EIA report
The HSWA is the primary legislation instrument covering workplace health and safety in the UK. The Act establishes various obligations to ensure, so far as is reasonably practicable, that persons are not exposed to risks to their health and safety whilst at work. Several regulations made under the Act (e.g. The Major Accident Control Regulations) place general duties on employers to assess risks and to implement controls. The overriding principle is that foreseeable risks to persons shall be reduced so far as is reasonably practicable and that adequate evidence shall be produced to demonstrate that this has been done.	In Section 19.8 of this chapter, it is demonstrated that Morven North has suitable designed-in measures and mitigation to reduce risks to persons to ALARP and complies with good risk management practice in terms of major events.

Table 19.3: Summary of provisions within Construction Design and Management 2015 Regulations of relevance to major accidents and disasters

Summary of relevant legislation	How and where considered in the EIA report
The CDM Regulations place specific duties on clients, designers, contractors and workers, so that health and safety is considered throughout the life of a construction project from its inception to its subsequent final demolition and removal. Under the CDM Regulations, designers must avoid foreseeable risks so far as reasonably practicable by eliminating hazards from the construction, 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.	The designed-in measures and mitigation in Section 19.8 of this chapter demonstrate how Morven North will achieve the requirements and implementation of the CDM Regulations, which include management of construction risk to ALARP.

Table 19.4: Summary of provisions within Control of Major Accident Hazards Regulations 2015 of relevance to major accidents and disasters

Summary of relevant legislation	How and where considered in the EIA report
The COMAH Regulations aim to prevent and mitigate the effects of major accidents involving dangerous substances which can cause serious damage/harm to people and/or the environment. COMAH treats risks to the environment as seriously as those to people.	The baseline relevant to natural hazards and the climate system are discussed in Section 19.6 and Table 19.10 includes where the nearest COMAH site to Morven North is located.

Table 19.5: Summary of provisions within Scotland's National Marine Plan of relevance to major accidents and disasters

Summary of relevant policy	How and where considered in the EIA report
Sets out strategic policies for the sustainable development of Scotland's marine resources and is compatible with the UK National Policy Statement (NPS) and existing Marine Plans across the UK.	The NMP is of relevance to Morven North as it addresses the potential for interactions between renewable energy development and other marine users. This is of relevance to the Major Accidents and Disasters chapter in relation to the vulnerability of Morven North to major accidents and disasters associated with other marine users. The NMP sets several minimum requirements including: • Achieving a sustainable marine economy; • Ensuring a strong, healthy and just society; • Living within environmental limits; • Promoting good governance; • Using sound science responsibly. Interactions between Morven North and other marine users is addressed in Section 19.6 which provides a summary of the content presented in Volume 2, Chapter 16: Other Sea Users and Communications. It is also noted that work is underway to develop Scotland's National Marine Plan 2 (NMP2). In November 2024, the Scottish Government published a Planning Position Statement for consultation, setting out proposed high-level objectives and policy directions for the updated plan, summarising work completed to date, and consolidating early stakeholder feedback (Scottish Government, 2024a). The consultation ran from 05 November 2024 to 07 February 2025. The NMP2: Planning Position Statement Consultation Analysis Report was subsequently published on 29 August 2025 and summarises the feedback received during the consultation and outline show this will inform the next stages of NMP2's development (Scottish Government, 2025).

Table 19.6: Summary of provisions within the UK Marine Policy Statement of relevance to major accidents and disasters

Summary of relevant policy	How and where considered in the EIA report
Provides a framework for marine spatial planning, specifically for the preparation of Marine Plans and to ensure that marine resources are used in a sustainable way.	The MPS confirms that all public authorities, in examining and determining applications for all energy infrastructure, the relevant marine policy statement must be followed, and the following must be considered: • the national level of need for energy infrastructure; • the positive wider environmental, societal and economic benefits of low carbon electricity generation; • that renewable energy resources can only be exploited where the resource exists and where economically feasible; • the potential for inward investment on energy related manufacturing and deployment activity and employment opportunities and regeneration of local national economies,

Summary of relevant policy	How and where considered in the EIA report
	supporting the objective of developing the UK's low carbon manufacturing capability. The MPS also confirms that the level of assessment undertaken for any project should be proportionate to the scale and potential impact of the project, as well as the sensitivity of the environment concerned and in accordance with the EIA Directive, where applicable. This chapter considers the potential vulnerability to and of Morven North to cause or be impacted by major accidents and disasters in Section 19.9.

Table 19.7: Summary of provisions within the National Planning Framework 4 of relevance to major accidents and disasters

Summary of relevant policy	How and where considered in the EIA report
Adopted in 2023, Policy 23 of the NPF 4 focuses on health and safety in land-use planning. It requires consideration of risks associated and potential impacts with hazardous sites, pipelines, and major accident hazards when determining development proposals. The policy aims to ensure that infrastructure development and investment to achieve Scotland's 2045 net zero target is delivered in a way that protects people and places from environmental harm and mitigate risks arising from safety hazards.	Policy 23 of the NPF 4 has been addressed by reviewing the potential for major accident hazards during project design and operation. The assessment presented in Table 19.12 concluded that Morven North would not reasonably lead to significant risks associated with hazardous sites or infrastructure. The designed-in measures and mitigation in place to ensure resilience and public safety have been extracted from the relevant technical chapters and are detailed in Section 19.8 of this chapter. No assessment of the cumulative effects has taken place as it was concluded that Morven North is not expected to contribute to any major accidents and disasters.

19.4 Consultation

19.4.1.1 The approach to consultation for Morven North is set out in Volume 1, Chapter 5: Consultation. A summary of the key issues raised during consultation activities undertaken to date specific to major accidents and disasters is presented in Table 19.8, together with how these issues have been considered in the production of this major accidents and disasters EIA Report chapter. Further detail is presented within Volume 3, Annex 5.1: Consultation. It should be noted that Table 19.8 summarises the consultation responses pertinent to the major accidents and disasters assessment. To avoid repetition, consultation relating to other technical topics is reported within each of the respective technical chapters listed in paragraph 19.5.1.1.

Table 19.8: Summary of key consultation issues raised during consultation activities undertaken for Morven North of relevance to major accidents and disasters

Date	Consultee and type of consultation	Summary of issue(s) raised	Applicant's response to issue raised and, if applicable, where considered in this chapter
30 November 2023	Morven Site Scoping Opinion: Maritime and Coastguard Agency (MCA)	MCA stated: "Particular consideration will need to be given to the implications of the site size and location on Search and Rescue (SAR) resources and Emergency Response Co-operation Plans (ERCoP). The report must recognise the level of radar surveillance, Automatic Identification System (AIS) and shore-based Very High Frequency (VHF) radio coverage and give due consideration for appropriate mitigation such as radar, AIS receivers and in-field, Marine Band VHF radio communications aerial(s) (VHF voice with Digital Selective Calling (DSC)). A Search and Rescue (SAR) checklist will also need to be completed in consultation with MCA, as per Marine Guidance Note (MGN) 654 Annex 5 SAR requirements".	Engagement with the MCA will continue post-consent in development of the ERCoP. Details are presented in Table 19.9 of this chapter. Further information is presented in Volume 2, Chapter 13: Shipping and Navigation and Volume 4, Annex 5: Navigation Safety Plan and Vessel Management Plan (NSPVMP) (Version 1). A MGN 654 checklist has been included as Appendix A to Volume 3, Annex 13.1: Shipping and Navigation Shared Navigational Risk Assessment.
30 November 2023	Morven Site Scoping Opinion: Northern Lighthouse Board	Northern Lighthouse Board stated: "Within Table 9.33 (Measures of relevance to the likelihood and severity of major accidents and disasters) Reference Number MM-35 should specifically reference the development of a Lighting and Marking Plan, alongside a NSP and VMP".	The designed-in measures and mitigation of relevance to major accidents and disasters are presented in Section 19.8. The Applicant can confirm that a Lighting and Marking Plan (LMP) (Volume 4, Annex 4: Lighting and Marking Plan (LMP) (Version 1)) and a Navigation Safety Plan and Vessel Management Plan (NSPVMP) (Volume 4, Annex 5: Navigation Safety Plan and Vessel Management Plan (NSPVMP) (Version 1)) will be produced for Morven North.
30 November 2023	Morven Site Scoping Opinion: MD-LOT	Paragraph 5.17.1 of the Scoping Opinion: MD-LOT requests "the EIA Report must include a description and assessment of the likely	This chapter has been developed as per feedback received as part of the Scoping Opinion for the Morven Site to include a description and

Date	Consultee and type of consultation	Summary of issue(s) raised	Applicant's response to issue raised and, if applicable, where considered in this chapter
		significant effects deriving from the vulnerability of the Proposed Development to major accidents and disasters".	assessment of LSE[1] deriving from the vulnerability of Morven North's susceptibility to potential major accidents and disasters. This assessment is discussed in Section 19.9.
30 November 2023	Morven Site Scoping Opinion: MD-LOT	Paragraph 5.17.1 of the Scoping Opinion: MD-LOT request for the "appropriate guidance, including the recent IEMA "Major Accidents and Disasters in EIA: A Primer" to better understand the likelihood of an occurrence and the Proposed Development susceptibility to potential major accidents and hazards".	The Applicant can confirm this chapter has been developed as per IEMA guidance 'Major Accidents and Disasters in EIA: A Primer' (IEMA, 2020).
30 November 2023	Morven Site Scoping Opinion: MD-LOT	Paragraph 5.17.2 of the Scoping Opinion: Scottish Ministers advise that "existing sources of risk assessment or other relevant studies should be used to establish the baseline rather than collecting survey data".	The baseline presented in this chapter has been established from information detailed in the other technical chapters of the Morven North EIA Report listed in paragraph 19.5.1.
30 November 2023	Morven Site Scoping Opinion: MD-LOT	Paragraph 5.17.3 of the Scoping Opinion: MD-LOT request that 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".	This chapter has been developed as per IEMA guidance 'Major Accidents and Disasters in EIA: A Primer' (IEMA, 2020), therefore differing from the other technical chapters in the Morven North EIA Report. However, this chapter presents an approach to assessment in line with relevant guidance including the consideration of designed-in measures and mitigation to reduce and control risk (see Section 19.8). LSE[1] have been assessed in Section 19.9.

19.5 Approach to baseline characterisation

19.5.1 Desktop study

19.5.1.1 Information on major accidents and disasters within the Major Accidents and Disasters Study Area was collected through a detailed desktop review of existing studies and datasets from the following technical chapters:

- Volume 2, Chapter 12: Commercial Fisheries;
- Volume 2, Chapter 13: Shipping and Navigation;.
- Volume 2, Chapter 15: Aviation (Military and Civil);
- Volume 2, Chapter 16: Other Sea Users and Communications;
- Volume 2, Chapter 18: Climate Change.

19.5.1.2 Each of the technical chapters listed above contain a detailed account of the desktop sources used, with a summary provided in this chapter.

19.5.2 Site specific surveys

19.5.2.1 No site specific surveys are required to inform the EIA for major accidents and disasters. This is because information on receptors and topic-related data can be readily obtained through existing surveys, desktop studies, and consultation with relevant stakeholders, with suitable datasets available across the northeast Scotland region.

19.5.2.2 Whilst no surveys were undertaken for this specific chapter, the baseline presented has been informed by two site specific 14-day vessel traffic surveys that were completed in summer and winter 2024 that are MGN 654-compliant and thus have been used as the primary data source for characterising the vessel traffic baseline (additional surveys have been undertaken in winter 2022, summer 2023 and winter 2023, and have been used as validation of the primary data sources), as set out in Volume 2, Chapter 13: Shipping and Navigation. A summary of the results is provided in paragraphs 19.6.1.12 to 19.6.1.14 of this chapter. Other technical chapters, as listed in paragraph 19.5.1.1, reference their own discipline-specific datasets, and as no site-specific surveys were required for those chapters, the vessel traffic survey data are the only site-specific datasets drawn upon for the baseline description.

19.6 Baseline environment

19.6.1 Overview of baseline environment

19.6.1.1 This section provides an overview of the baseline environment relevant to major accidents and disasters. The study areas for the various EIA topics listed in paragraph 19.5.1.1 which inform this chapter differ, reflecting the distinct receptors and the spatial scales over which potential impacts must be assessed. Nevertheless, all identified study areas are considered appropriate for the purposes of this assessment.

19.6.1.2 In accordance with IEMA guidance and the recommendations outlined in the Morven Site Scoping Opinion (IEMA, 2020; MD-LOT, 2023), the baseline environment presented in this section is based on existing information sources. This approach has been used to identify hazards relevant to Morven North and to inform this major accidents and disasters chapter, rather than relying on new survey data, as is typically done for other EIA receptor topics.

Unexploded ordnance

19.6.1.3 This section provides an overview of Unexploded Ordnance (UXO) in proximity to Morven North, as described in Volume 1, Chapter 3: Project Description.

19.6.1.4 It is possible that UXO may be encountered during the construction or installation of offshore infrastructure. This poses a potential health and safety risk where it coincides with the planned location of infrastructure and associated vessel activity, and therefore it is necessary to survey for and carefully manage clearance of UXO.

19.6.1.5 If avoidance methods are not viable, a specialist contractor will clear UXOs before further site preparation and construction commence. The preferred clearance method involves using a low order technique (subsonic combustion) with a single donor charge of 0.25kg Net Explosive Quantity for each clearance event. Only one detonation will be conducted within a 24-hour period, with an assumption that 15 UXOs may require clearance using low order technique (subsonic combustion), based upon existing knowledge from Seagreen 1 Offshore Wind Farm (Seagreen Wind Energy Ltd, 2022). It should be noted that high order clearance methods may be utilised if avoidance, relocation and low order techniques were not viable, therefore remaining as a risk in this chapter.

19.6.1.6 Further information relating to UXO clearance within Morven North is provided in Volume 2, Chapter 10: Marine Mammals and Volume 4, Annex 2: Marine Mammal Mitigation Protocol (MMMP) (Version 1).

Commercial fisheries

19.6.1.7 This section provides an overview of the commercial fishing activity in proximity to Morven North, as described in Volume 2, Chapter 12: Commercial Fisheries.

19.6.1.8 The Morven North Local Commercial Fisheries Study Area comprises International Council for the Exploration of the Seas (ICES) rectangles 42E8 and 42E9, while the Regional Commercial Fisheries Study Area includes these and adjacent rectangles 41E7 to 41F0, 42E7, 42F0, and 43E7 to 43F0 (12 ICES rectangles in total). AIS data does not indicate any sustained fishing vessel presence across Morven North. However, it should be noted that AIS data only relates to fishing vessels ≥15m length and does not distinguish between transiting vessels and active fishing, this is further supported by the minimal fishing vessels observed within the Morven Site during the marine traffic surveys (see paragraph 19.5.2.2) undertaken in June/July 2024 and November/December 2024.

19.6.1.9 Demersal trawlers actively target demersal whitefish such as haddock (*Melanogrammus aeglefinus*) and Nephrops (*Nephrops norvegicus*) across the Morven North Local Commercial Fisheries Study Area. Within Morven North, demersal trawl fishing effort is limited; however, the northeastern boundary and particularly the southeastern corner of Morven North align with the fringes of established demersal trawl grounds located to the north and east.

19.6.1.10 Dredgers primarily target king scallop (*Pecten maximus*) with scallop dredge grounds present inshore to the west of Morven North boundaries. No dredging activity is evident within Morven North itself.

19.6.1.11 Fishing effort associated with demersal seine is very limited within Morven North, with some evidence of low-level activity northeast of Morven North's boundaries. Pelagic trawl and potting show no fishing effort within Morven North; however, there is potential for pelagic trawl activity north of Morven North and potting activity concentrated in inshore waters.

Shipping and navigation

19.6.1.12 This section provides an overview of the shipping and navigation activity in proximity to Morven North, as described in Volume 2, Chapter 13: Shipping and Navigation.

19.6.1.13 Volume 2, Chapter 13: Shipping and Navigation describes the existing navigational features within a 10nm buffer surrounding the Morven North Boundary, which has been considered in this major accidents and disasters chapter. Surveys of this area indicate that daily vessel traffic ranges from an average of five unique vessels per day during summer months, and from two to three unique

vessels per day during winter months. Most of the vessel traffic observed consisted of cargo and oil and gas vessels during summer, and predominantly cargo vessels during winter. Cargo vessels were the most common vessel type, with minimal levels of fishing and recreational vessels.

19.6.1.14 A total of 16 main commercial routes were identified from the vessel traffic survey data. The busiest of these routes (Aberdeen to Catcher field) was transited entirely by oil and gas vessels, with approximately an average of 16 vessels per week. Routes between Iceland and Rotterdam (10 vessels per week) were the second busiest route with quieter routes from Aberdeen or Montrose to German and Swedish ports being utilised by an average of one to two vessels per week.

19.6.1.15 Historical maritime incident records show very low levels of activity within the Morven North Shipping and Navigation Study Area, with only 1 SAR helicopter tasking, 7 Royal National Lifeboat Institution (RNLI) responses to five incidents, and seven Marine Accident Investigation Branch (MAIB)-recorded incidents across two decades, with none occurring within the Morven North Boundary itself.

Aviation (Military and Civil)

19.6.1.16 This section provides an overview of the aviation activity in proximity to Morven North, as described in Volume 2, Chapter 15: Aviation (Military and Civil).

19.6.1.17 The Morven North Boundary is located within the Scottish Flight Information Region (FIR) in an area of Class G uncontrolled airspace, which is established from surface up to Flight Level (FL) 195 (approximately 19,500 feet (ft)). Above this Class G airspace is Class C Controlled Airspace (CAS). The Regional Aviation (Military and Civil) Study Area encompasses the Morven North Boundary and extends to include applicable airspace between Morven North and the UK mainland, covering radar systems such as National Air Traffic Services (NATS) (En Route) plc (NERL) Allanshill Primary Surveillance Radar (PSR) to the north and the Ministry of Defence (MOD) Brizlee Wood Remote Radar Head (RRH) Air Defence Radar (ADR) to the south, in line with Civil Aviation Publication (CAP) 764 guidance.

19.6.1.18 Within Class G and Class C airspace, the following Air Traffic Control (ATC) rules apply:

- Class G airspace – pilots may enter this uncontrolled airspace subject to a set of simple rules. Pilots are not obliged to contact ATC agencies, but many do for other traffic information, pilots remain responsible for their own safety and the avoidance of terrain, other aircraft and obstacles.
- Class C airspace – pilots require clearance to enter this controlled airspace in which instructions provided to pilots are mandatory. All aircraft operating in this airspace must be in receipt of an air traffic service from NATS En-Route plc (NERL) or military controllers located at the NERL Area Control Centre. Subject to the flight conditions and type of flight, aircrafts are separated from each other within this class of airspace.

19.6.1.19 An overview of the baseline presented in Volume 2, Chapter 15: Aviation (Military and Civil) is provided below:

- Civil aviation: Aberdeen Airport is located approximately 40nm northwest of the site on a bearing of 296° (measured to the Airfield Reference Point (ARP). Airports with published Instrument Flight Procedures (IFPs) have associated Minimum Sector Altitudes (MSA). A MSA defines the minimum safe altitude an aircraft can descend to within a sector of radius 25nm (approximately 46km). These sectors provide obstacle clearance protection of at least 1,000ft to aircraft within that area. This allows pilots of aircraft flying under Instrument Flight Rules (IFR) the reassurance of properly designated obstacle and terrain clearance protection while making an approach and landing at an airport in poor weather. Morven North will not impact safeguarded areas and IFP that serve the Aberdeen Airport.

- Military aviation: the nearest ADR systems are TPS-77 (Type 92) located at RRH Buchan in Aberdeenshire which is located approximately 50nm northwest of the site on a bearing of 324° from the closest boundary of the Morven North Boundary, and RRH Brizlee Wood in Northumberland located approximately 71nm southwest of the site on a bearing of 209°. ADR systems are used to compile a Recognised Air Picture (RAP) to monitor the airspace in and around the UK to launch a response to any potential airborne threat. The MOD Leuchars Station PSR is located approximately 60nm southwest of the Morven North Boundary on a bearing of 250°. The Morven North Boundary will be located outside of Leuchars Area of Responsibility which is expected to extend to 40nm radius from the Leuchars Station PSR position. The Morven North Boundary is adjacent to Low Flying Area (LFA) 14, and, therefore, military low flying is likely to take place above and around the Morven North Boundary.
- Helicopter operations: The closest SAR helicopter base to Morven North is Inverness Airport approximately 103nm west of the Morven North Boundary. Helicopters supporting offshore oil and gas, in the northern North Sea, use Helicopter Main Route Indicators (HMRI), radiating from Aberdeen International Airport (the main support base) on a hub/spoke radial pattern. These HMRIs lie to the north of the Morven North Boundary; the closest being 7.5nm to the north of the northeastern boundary of the Morven North Boundary on a bearing of 029°. The Civil Aviation Authority (CAA) recommends within CAP 764 (CAA, 2016) that there should be no obstacles within 2nm either side of the centreline of a HMRI; the Morven North Boundary is located outside of the CAA recommended obstacle free distance.
- Other radar and communications: The Morven North Boundary is located outside of the Met Office consultation zone, at approximately 81.5km from the nearest Met Office radar at Hill of Dudwick, Aberdeenshire.

Other sea users, marine infrastructure and communications

19.6.1.20 This section provides an overview of the offshore energy projects and offshore cables in proximity to Morven North, as described in Volume 2, Chapter 16: Other Sea Users and Communications.

19.6.1.21 The Local Other Sea Users, Marine Infrastructure and Communications Study Area includes the Morven North Boundary plus a 1km buffer, while the Regional Study Area extends approximately 5km to 14km from the Morven North Boundary to capture potential indirect effects such as suspended sediment changes. The closest operational Offshore Wind Farm (OWF) to the Morven North Boundary is the Seagreen 1 OWF located approximately 25km west of Morven North. There are several OWFs in the consenting and pre-construction phases that, if consented and constructed, will be in proximity to the Morven North. The closest proposed OWF is Ossian OWF, located approximately 9km from the Morven North Boundary. Table 16.9 in Volume 2, Chapter 16: Other Sea Users and Communications provides further information on the proximity and development status of other OWFs near the Morven North Boundary.

19.6.1.22 The closest offshore cable is the Eastern Green Link 2 (EGL2) cable which is currently under construction and intersects the Local Other Sea Users, Marine Infrastructure and Communications Study Area and Morven North at its western corner. It is intended that a commercial “crossing and proximity agreement” on standard industry terms will be entered into with the cable operator.

19.6.1.23 The east coast of Scotland supports oil and gas activities with Dundee and Aberdeen ports having deep-water berths and extensive landside project areas to accommodate the significant fabrication and refit projects for North Sea and Norwegian sector operations. The closest active licenced hydrocarbon block to Morven North is Block 27/3a operated by North Sea Natural Resources Ltd (Licence Number: P2321), approximately 24km northeast of the Local Other Sea Users, Marine Infrastructure and Communications Study Area.

19.6.1.24 There are no oil and gas pipelines located within the Morven North Boundary. The closest pipeline, Forties crude oil pipeline, is currently not in use and is located approximately 61km from the Local Other Sea Users, Marine Infrastructure and Communications Study Area.

19.6.1.25 There are no wave or tidal projects, marine aggregate extraction sites, marine disposal sites, Carbon Storage and Capture (CCS) areas, active or disused subsea cables and pipelines identified within the Morven North Boundary or within the Morven North and Morven South Regional Other Sea Users, Marine Infrastructure and Communications Study Area. Further information can be found in Volume 2, Chapter 16: Other Sea Users and Communications).

Climate change

19.6.1.26 This section provides an overview of existing environmental baseline of Morven North and any LSE[1] on and from climate change, as described in Volume 2, Chapter 18: Climate Change, Volume 3, Annex 18.1: Shared Climate Change Risk Assessment, and Volume 3, Annex 18.2: Climate Change Shared Greenhouse Gases Technical Report.

19.6.1.27 The baseline consists of various subtidal habitats with the predominant sediment type being sand, slightly gravelly sand and muddy sand. These sediments are likely to contain stores of 'blue carbon', which is organic carbon that has been captured and stored through biological processes in the coastal and marine environment (Cunningham and Hunt, 2023).

19.6.1.28 Morven North will likely contribute to the abatement of fossil fuel generation within the UK Grid (i.e. UK Grid carbon intensity). As such, the current baseline with regard to the UK Grid-average emission factor for electricity generation, without Morven North, is 222.9kg CO2e/MWh which includes emissions from fuel extraction and processing ('well-to-tank') but only accounts for electricity as it is generated, not losses during transmission or distribution (i.e. excluding export cable and distribution losses)) (Department for Energy Security and Net Zero (DESNZ) and Defra, 2025). Further information is presented in Volume 3, Annex 18.2: Climate Change Shared Greenhouse Gases Technical Report.

19.6.1.29 Air temperatures in the central North Sea do not tend to vary beyond the range of 0°C to 19°C, with the exception of extended periods of easterly winds which can lead to extreme cold in winter and warm conditions in summer. Mean air temperatures range from lows of 1°C in January to 13°C in July (Department for Business, Energy and Industrial Strategy (BEIS), 2022)).

19.6.1.30 Precipitation rates across the central North Sea follows a seasonal trend with April to June tending to be the driest months, and October to January being wetter. Thunderstorms are infrequent, and snow showers vary from approximately 10 to 12 days in the central North Sea (BEIS, 2022).

19.6.1.31 The prevailing winds in the central North Sea are from the southwest and the north northeast; wind strengths in winter are typically in the range of Beaufort scale 4 to 6 (6m/s to 11m/s) with higher winds of force 8 to 12 (17m/s to 32m/s) being much less frequent. Maximum wave heights recorded within the Morven North Boundary and Morven South Boundary were 10.09m and 9.95m, respectively. Waves predominantly come from the north, northeast and north.

19.6.1.32 Mean Sea Level (MSL) is a crucial element of climate change related risks for offshore wind farms, as increased MSL has the potential to both increase water damage and corrosion of components above the water line at the time of construction. Increased MSL also has the potential to cause increased damage from storm surge. Global MSL rose by 0.2m between 1901 and 2018, and continues to rise (Intergovernmental Panel on Climate Change (IPCC), 2021)).

19.6.1.33 Further information is presented in Volume 3, Annex 18.1: Shared Climate Change Risk Assessment.

19.6.2 Future baseline scenario

19.6.2.1 The EIA Regulations require the following to be included within the EIA Report: "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 development 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."

19.6.2.2 In the event that Morven North does not come forward, an assessment of the future baseline conditions has been carried out and is described within this section.

Commercial fisheries

19.6.2.3 Commercial fisheries patterns change and fluctuate based on a range of natural and management-controlled factors including:

- response to existing offshore developments;
- market demand;
- market prices;
- stock abundance;
- fisheries management;
- environmental management;
- improved efficiency and gear technology;
- sustainability.

19.6.2.4 Recent changes in fisheries management and international agreements have significantly influenced commercial fishing patterns in UK waters. Key examples include the prohibition of sandeel (Ammodytidae) fishing in the UK Exclusive Economic Zone (EEZ) since 2021 and restrictions on scallop dredging in protected areas like Dogger Bank Special Area of Conservation, which have displaced fishing activity and increased reliance on existing grounds. The observed changes and trends in commercial fisheries activity are a key component of the baseline and are the main reason for considering up to five years of relevant data. Under normal circumstances, the future baseline would be adequately represented by the current baseline assessment. However, in this case, the available data do not capture the potential shifts in commercial fishing activity arising from the UK's withdrawal from the EU.

19.6.2.5 Under the UK-EU Trade and Cooperation Agreement, reciprocal access to EEZs continues during a transition period until June 2026, with 25% of EU quotas transferring to the UK. In May 2025, a new agreement extended reciprocal access until 2038, maintaining historical rights while annual negotiations on quotas persist. While quota transfers mainly affect quota species, UK fleets targeting non-quota shellfish are expected to remain largely unaffected.

19.6.2.6 Market dynamics, global events, and environmental factors can significantly influence fishing activity in the Morven North Regional Commercial Fisheries Study Area. Tariff or trade barriers may affect species targeted for export, while the COVID-19 pandemic temporarily disrupted supply chains before recovery in 2021. Climate change poses long-term risks, with warming seas and pH changes potentially altering species distribution, particularly for whitefish like haddock, while shellfish such as Nephrops show greater resilience. These shifts, along with increased storm frequency, could lead to changes in fishing grounds, methods, and seasonal patterns over time.

19.6.2.7 Further information is presented in Volume 2, Chapter 12: Commercial Fisheries.

Shipping and navigation

19.6.2.8 There is uncertainty in predicting long-term growth in vessel traffic, especially due to potential new UK or transboundary port developments. Future OWF developments may lead to increased vessel

activity related to construction and O&M. Additionally, oil and gas vessel traffic may fluctuate depending on future development or decommissioning, which is influenced by unpredictable market conditions. To account for this, two growth scenarios of 10% and 20% have been modelled for the operational lifetime of Morven North. This is in line with the approach presented at the Hazard Workshop and typical industry standards, having been implemented within various previous Navigational Risk Assessments (NRA). These scenarios are included in the quantitative modelling within Volume 3, Annex 13.1: Shipping and Navigation Shared Navigational Risk Assessment. It is expected that commercial vessels will adjust their routes to avoid future OWF developments, consistent with observed behaviour near other UK OWFs.

19.6.2.9 There is also uncertainty in forecasting long-term trends for commercial fishing and recreational vessel movements due to limited reliable data. Currently, there are no known major developments expected to significantly increase activity in these sectors within the region.

19.6.2.10 Further analysis of changes in vessel traffic is provided in Volume 2, Chapter 13: Shipping and Navigation.

Aviation (Military and Civil)

19.6.2.11 In relation to helicopter use, the North Sea Transition Authority (NSTA) Oil and Gas Authority Annual Report and Accounts 2023-2024 (NSTA, 2024) reported a predicted decline in North Sea production of hydrocarbons and usage in following years. DESNZ consulted on a plan to unleash the North Sea's clean energy future and ensure prosperous and sustainable transition for oil and gas. Results of the consultation are awaited. While the UK Government has pledged not to issue new licences for exploration, existing oil and gas fields will continue to be maintained for their lifespan. The North Sea is expected to continue producing a significant portion of the UK's oil and gas, but the focus is shifting towards renewable energy sources like wind, carbon capture, and hydrogen.

19.6.2.12 As old oil and gas fields are decommissioned it is considered that helicopter use at oil and gas platforms associated with these fields will eventually decline; however, as helicopter support to offshore wind increases it is expected that there may be increased aviation activity as new offshore areas are developed to support net zero targets. Based on the timings of the development of Morven North, the baseline environment for aviation (Military and Civil) is not expected to change. The present airspace construct or usage by military and civil aircraft above and around the Morven North Boundary is not expected to change significantly.

19.6.2.13 Further information is presented in Volume 2, Chapter 15: Aviation (Military and Civil).

Other sea users, marine infrastructure and communications

19.6.2.14 There is significant potential for growth in offshore wind energy in Scotland. The Scottish Government has outlined plans to increase new offshore wind capacity to 40GW by 2040 (Scottish Government, 2026). In June 2020, Crown Estate Scotland (CES) initiated the first ScotWind Leasing Round for commercial scale offshore wind energy projects in Scottish waters (Scottish Government, 2020). Additional information and an overview of the ScotWind Leasing Round are available in Volume 1, Chapter 4: Site Selection and Consideration of Reasonable Alternatives. As part of the ScotWind Leasing Round, 20 Plan Option Lease Agreements were offered, of which 17 development sites, including Morven North, with a combined generating capacity of nearly 27.6GW, were awarded. Other renewable energy sources, such as wave and tidal energy devices, are currently in the early stages of research and development.

19.6.2.15 Oil and gas continues to play a significant role in Scotland's energy landscape, historically accounting for around 90% of primary energy. However, the Scottish Government's draft Energy Strategy and Just Transition Plan (2023) outlines a shift toward a net zero energy system, emphasizing reduced reliance on fossil fuels. The plan, which received over 1,500 consultation

responses, aims to position Scotland as a renewable energy leader while ensuring energy security and economic growth.

19.6.2.16 In addition to ScotWind, the Innovation and Targeted Oil and Gas Decarbonisation leasing round introduced seabed rights for projects that either reduce emissions from oil and gas infrastructure or support small-scale innovation. Despite these renewable energy developments, the baseline environment near Morven North remains stable for oil and gas and marine aggregate activities, with no recent or licensed extraction in the area, suggesting limited change in these sectors for the foreseeable future.

19.6.2.17 The future baseline scenario for CCS and offshore cables is subject to progressive change as potential future licensing opportunities arise, and new projects and sites are identified. Further information is presented in Volume 2, Chapter 16: Other Sea Users and Communications.

Climate change

19.6.2.18 The future baseline Greenhouse Gas emissions for existing land use (seabed) without Morven North are expected to remain similar to that listed in paragraph 19.6.1.27. Some areas of the North Sea experience almost no sediment accumulation and associated carbon sequestration through organic carbon deposits (Cunningham and Hunt, 2023). As such, no material change to the blue carbon stored within the Morven North Climate Change Study Area is anticipated in the future baseline.

19.6.2.19 The future baseline for electricity generation that would be displaced by Morven North depends broadly on future energy and climate policy in the UK, and more specifically (with regard to day-to-day emissions) on the demand for operation of Morven North compared to other generation sources available, influenced by commercial factors and National Grid's needs.

19.6.2.20 Several future baseline scenarios have therefore been considered using DESNZ projections of the carbon intensity of long-run marginal electricity generation during Morven North's operating lifetime (DESNZ, 2023) and assumptions about specific generation sources that could be displaced. These are detailed in Volume 3, Annex 18.2: Climate Change Shared Greenhouse Gases Technical Report.

19.6.2.21 The carbon intensity of baseline UK Grid electricity generation (see paragraph 19.6.1.28) is projected to reduce over time and so too would the intensity of the marginal generation source, displaced at a given time. This means that the emissions benefit of displacing grid electricity through Morven North will gradually decrease as the grid becomes cleaner. This is relevant to major accidents and disasters because the assessment considers both the potential safety risks and Morven North's contribution to reducing greenhouse gas emissions over its lifetime.

19.6.2.22 In the near future (the next decade to two decades), variations in average temperature and precipitation will likely be the most visible year-to-year changes in climate. In subsequent decades, within the operating lifetime of Morven North, anthropogenic climatic changes are expected to become more apparent.

19.6.2.23 It is virtually certain that sea surface temperatures will continue to increase in the 21st century, with global mean sea surface temperatures predicted to increase by approximately 2.9°C by 2100 under Representative Concentration Pathway (RCP) 8.5. Sea temperatures in northern Europe (including the North Sea) are predicted to rise at a greater rate than the global average, with temperatures predicted to increase by approximately 3.4°C under RCP8.5 in the same time period. Ocean acidification is anticipated to increase, with a fall in surface pH by 0.4 units by 2100 under RCP8.5 (IPCC, 2021).

19.6.2.24 Average wave height is predicted to decrease around much of the UK, with average wave heights in the North Sea decreasing by approximately 0.1m. Given the close relationship between wave heights and wind speeds, average changes in wind speed are predicted to follow similar patterns to those predicted for average wave height, with a slight increase to the north of the British Isles. However,

there is little consensus between models regarding the extent and pattern of such winds and wave heights in relation to climate change (Palmer *et al.,* 2018). Therefore, a conservative expectation would be an increase in both maximum wind speed and wave height.

19.6.2.25 Average sea level rise around the UK is expected to increase by 1m by 2100, though a lesser rise is anticipated in the north of the UK. The east coast of Scotland can expect to see a MSL rise of between approximately 0.5m and 0.6m by 2100 (Palmer *et al.,* 2018).

19.6.2.26 Further information is presented in Volume 2, Chapter 18: Climate Change and Volume 3, Annex 18.1: Shared Climate Change Risk Assessment.

19.6.3 Data limitations and assumptions

19.6.3.1 The data sources used in this chapter are based on the existing studies, datasets and limitations presented within the technical chapters listed in paragraph 19.1.1.2.

19.6.3.2 The data presented represent the most current publicly available information sourced from the relevant references cited in the associated chapters. As such, the dataset is constrained by what was accessible and released at the time of writing the Morven North EIA Report. Nevertheless, the data used in the assessment are considered to be robust and adequate for evaluating the potential effects presented.

19.7 Methodology for assessment of effects

19.7.1 Overview

19.7.1.1 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 (IEMA, 2020).

19.7.1.2 This methodology guides the assessment to focus on potential events of low likelihood but high consequence such as a major spill, explosion, fire etc. Minor incidents, for example sediment loss, are addressed within the relevant topic chapters of the Morven North EIA Report. As such, this chapter is dedicated exclusively to the evaluation of major events.

19.7.1.3 Morven North is subject to two primary areas of vulnerability. For the purpose of this assessment, vulnerability refers to the degree to which Morven North may be adversely affected by internal or external risks. Internal risk is defined as the potential for Morven North's own activities, infrastructure, or operations to give rise to major accidents and disasters. External risk refers to the potential for Morven North to be impacted by major accidents and disasters originating from external sources, such as third-party activities or natural hazards. The screening of these identified risks, and their justifications can be observed in Table 19.10 and Table 19.11, with the risk assessment presented in Table 19.12. In some instances, identified risks have been evaluated in other sections of the Morven North EIA Report. Where applicable, cross-references to those assessments have been provided.

19.7.1.4 The methodology process comprised three key stages: screening, scoping, and assessment. The screening stage aimed to determine whether Morven North is vulnerable to major accidents and disasters, whether from internal or external risks, and whether such vulnerabilities could result in significant effects. In accordance with IEMA, 2020, this included identifying the reasonably foreseeable worst-case environmental consequence, defined as the worst plausible and challenging manifestation of a scenario, after highly implausible outcomes have been excluded. This ensures that assessment focuses on events capable of producing serious environmental effects, rather than minor, low-consequence incidents. The scoping stage explored in greater detail the potential for

such significant effects to arise from major accidents and disasters linked to a development. Finally, the assessment stage provided a deeper understanding of the likelihood of these risk events occurring and identified any need for additional mitigation measures.

19.7.1.5 The assessment of major accidents and disasters has taken into account the legislative framework established by the HSWA 1974 and its relevant statutory provisions. However, it is important to note that under UK health and safety legislation, the Health and Safety Executive (HSE) does not typically review risk or hazard assessments unless the situation falls under specific regulatory requirements.

19.8 Designed-in measures and mitigation

19.8.1.1 As part of the project design process, a number of measures (primary and tertiary) have been adopted to reduce the potential for impacts on major accidents and disasters (see Table 19.9) within the following technical chapters:

- Volume 2, Chapter 12: Commercial Fisheries;
- Volume 2, Chapter 13: Shipping and Navigation;.
- Volume 2, Chapter 15: Aviation (Military and Civil);
- Volume 2, Chapter 16: Other Sea Users and Communications;
- Volume 2, Chapter 18: Climate Change.

19.8.1.2 For the purposes of the EIA process, the term 'designed-in measure' is used to include the following measures (adapted from IEMA (2016; 2024)):

- Measures included as part of the design of Morven North. These include modifications to the location or design of Morven North, which are integrated into the application for consent. These measures are considered standard industry practice for this type of development and are referred to as primary mitigation in IEMA, (2016; 2024).
- Measures required to meet legislative requirements, or actions that are generally standard practice used to manage commonly occurring environmental effects. These measures are secured through the conditions of the marine licences and referred to as tertiary mitigation in IEMA (2016; 2024).

19.8.1.3 As there is a commitment to implementing these measures, they are considered inherently part of the design of Morven North and have therefore been considered in the assessment presented in Section 19.9 (i.e. the determination of magnitude and therefore significance assumes implementation of these measures).

19.8.1.4 The requirement for any additional mitigation measures is dependent on the significance of the effects on major accidents and disasters. Where significant effects have been identified, further mitigation measures (referred to as secondary mitigation in IEMA (2016; 2024) have been identified to reduce the significance of effect to acceptable levels following the initial assessment. These are measures that could further prevent, reduce and, where possible, offset any adverse effects on the environment. These measures are set out, where relevant, in Section 19.9.

19.8.1.5 All designed-in measures and secondary mitigation measures are detailed in Volume 3, Annex 6.3: EIA Commitments Register.

Table 19.9: Designed-in (primary and tertiary) measures adopted as part of Morven North

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
MM-1	Volume 2, Chapter 12: Commercial Fisheries	Development of and adherence to a Scour Protection Management Plan (SPMP).	There is the potential for scouring of seabed sediments to occur due to interactions between metocean regime (wave and currents) and foundations or other seabed structures. This scouring can develop into depressions around the structure. The use of scour protection around offshore structures and foundations will be employed, as described in Volume 1, Chapter 3: Project Description. The SPMP will set out the approach to scour protection installation and monitoring. This will maximise protection of offshore infrastructure as far as possible during the project lifecycle.	Primary
MM-2	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 16: Other Sea Users and Communications, and Volume 2, Chapter 13: Shipping and Navigation	Development of and adherence to a Cable Plan which will include a cable burial risk assessment (CBRA) and cable burial and protection monitoring throughout the operational phase.	A Cable Plan will set out the approach to protection of cables during the project life cycle. It will reduce the risks of vessel underwater allision with cable protection, anchor or fishing gear interaction with subsea cables and interference with magnetic position fixing equipment. The Cable Plan will implement management and monitoring of cable protection (via burial or external protection where adequate burial depth, as identified via risk assessment, is not feasible) with any damage, destruction or decay of cables notified to Maritime and Coastguard Agency, Northern Lighthouse Board, Kingfisher and UK Hydrographic Office no later than 24 hours after discovered. This will reduce the probability of cables becoming unburied and impacting other sea users and marine ecology receptors Cable burial and protection monitoring will be undertaken throughout the operational phase to assess the status of cable burial and any deployed protection.	Primary

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
			It will include the requirement of minimum burial depths of 0.5m or the use of cable protection around inter-array and interconnector cables and will include a Cable Burial Risk Assessment. Cable protection may be necessary in some locations where sufficient cable burial depth cannot be achieved or where cables become exposed during the lifetime of Morven North. The CBRA will consider relevant activities in the vicinity of inter-array and interconnector cables and confirm appropriate means of protection taking account of the final inter-array and interconnector cable. The CBRA will identify the appropriate target burial depth to ensure the cable remain buried, or appropriately protected, where target burial depths cannot be achieved, for the duration of Morven North, to reduce the risk of interaction with other sea users or cable exposure.	
MM-3	Volume 2, Chapter 12: Commercial Fisheries	Development of and adherence to an Operation and Maintenance Plan (OMP) that will include the requirement for any cable rock protection re-installed during the operations phase to follow industry standard guidelines for slope angle and rock grading.	The OMP will provide details of routine inspections which may be required post-construction including of inter-array and interconnector cables to ensure target burial depth is maintained. Routine inspections of cable and scour protection will be detailed, to monitor impact to physical processes and determine if remedial works are required. If secondary scour is identified, remedial works may be undertaken to both mitigate environmental impacts and to provide asset security.	Primary
MM-4	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 18: Climate Change.	Development of and adherence to a Construction Method Statement (CMS), which will require the use of durable materials	The CMS will ensure that all works are carried out efficiently, safely, and in compliance with environmental and regulatory requirements. The CMS will outline the planned approach, procedures, and safety	Tertiary

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
		within the offshore substation platform structures, in line with appropriate design standards for offshore wind in the North Sea.	measures for the offshore construction activities. Ensures resilience to future climate change, in particular from the risk of increased wear from sea level rise, extreme weather events and increased precipitation and changes to wind patterns.	
MM-6	Volume 2, Chapter 13: Shipping and Navigation	Development and adherence to a Marine Pollution Contingency Plan (MPCP).	To reduce the potential for release of pollutants from construction, operation and maintenance and decommissioning, a MPCP will be developed. The MPCP will include planning for accidental spills, addressing all potential contaminant releases and include key emergency details, and will be in line with appropriate regulations and guidelines.	Primary
MM-7	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 13: Shipping and Navigation, and Volume 2, Chapter 16: Other Sea Users and Communications	Development of and adherence to a NSPVMP.	A NSPVMP will be developed to reduce the risk introduced due to the presence of project vessels. The Navigation Safety and Vessel Management Plan will describe the measures related to navigational safety, including information on Safety Zones, charting, construction buoyage, temporary lighting and marking and means of notification of Morven North activity to other sea users (e.g. via Notices to Mariners). It will confirm the types and numbers of vessels engaged in Morven North and consider vessel coordination, including indicative transit route planning. To ensure Morven North project vessels are suitably managed to reduce the likelihood of involvement in incidents and maximise the ability to assist in the event of a third-party incident. The NSPVMP will include the requirement for Morven North vessels to comply with international marine regulations as adopted by the Flag State, including the International Regulations for Preventing Collisions at Sea	Primary

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
			(COLREGs) (International Maritime Organization (IMO), 1972/77) and the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974) through the NSP and VMP. The plan will reduce disturbance of seabird species as far as practicable, by avoiding bird populations or migratory routes and allow the identification of standard routes.	
MM-9	Volume 2, Chapter 15: Aviation (Military and Civil)	Notification to NOTAM (Notification to Airmen) will be made in the event of any failure of aviation lighting.	To mitigate the creation of obstruction(s) to the low flying airspace during construction, and to reduce the risk of temporary hazards.	Tertiary
MM-10	Volume 2, Chapter 15: Aviation (Military and Civil)	Notification to the Defence Infrastructure Organisation (DIO) of relevant construction works including temporary hazards.	To maximise awareness of temporary hazards, the Defence Infrastructure Organisation (DIO) will be provided with information regarding construction in advance of construction. Information to include: start and end dates, the maximum height of construction equipment and locations of offshore substation platforms.	Tertiary
MM-11	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 13: Shipping and Navigation, Volume 2, Chapter 16: Other Sea Users and Communications	Timely and efficient distribution of information via Notice to Mariners, Kingfisher notifications and other navigational warnings of the position and nature of works.	To ensure other sea users and marine infrastructure receptors are aware of Morven North, to allow relevant vessels to plan passage and thereby reduce potential for allision.	Tertiary
MM-12	Volume 2, Chapter 16: Other Sea Users and Communications	Consultation with oil and gas operators and other energy infrastructure operators, as required.	To promote and maximise cooperation between parties and reduce spatial and temporal interactions between conflicting activities.	Tertiary
MM-14	Volume 2, Chapter 13:	Compliance with Marine Guidance Note 654 and its	Ensures the final Morven North layout complies with required guidance, including SAR operations	Tertiary

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
	Shipping and Navigation	annexes, where applicable.	and underkeel clearance in line with Marine Guidance Note 654.	
MM-15	Volume 2, Chapter 13: Shipping and Navigation	Development of and adherence to a Development Specification and Layout Plan (DSLP).	The DSLP will confirm final layout and design of Morven North. This will be agreed in consultation with the MCA and NLM and will ensure the final layout of Morven North is suitable for both surface and air based (for SAR purposes) navigation and to ensure accurate mapping for navigation, and to ensure compliance with MGN654.	Primary
MM-17	Volume 2, Chapter 18: Climate Change	The wind turbine design will be fitted with automatic shutdowns/lockdowns safety margins to prevent spinning too fast in high winds.	Enables Morven North to be resilient to future climate change, in particular from the risk of increased frequency and intensity of extreme weather.	Primary
MM-18	Volume 2, Chapter 12: Commercial Fisheries	Development of and adherence to a Fisheries Mitigation, Monitoring and Communication Plan (FMMCP).	The FMMCP will detail the Applicant's proposed approach to mitigation, compensation and fisheries liaison, and facilitation of co-existence. The FMMCP will include details of the measures which are proposed to be implemented to reduce impacts on commercial fishing, the approach to monitoring fisheries activity and the approach to fisheries liaison and procedures to manage interactions between Morven North and the fishing industry. Some examples of what this will include are: - adherence to MD-LOT, Scottish Government, and FLOWW-derived guidance, including implementation of measures to reduce and mitigate as far as practicable, potential impacts to commercial fishers during the lifetime of Morven North. - commitment to considering Cooperation Agreements in instances where static gear may	Tertiary

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
			be required to be temporarily relocated. - employing industry -standard good practice measures during all phases of Morven North. - Contractors appointed by the Applicant will be contractually required to follow a code of good practice to ensure any external communication to other marine users, including fishers, is accurate, and to aid coexistence with the fishing industry. - Cable burial as the preferred means of cable protection (more details provided in a Cable Plan). - the Applicant will apply for safety zones. - vessel transit routing and shelter areas: management of Morven North related vessel activity by the Marine Coordinator via a Permit to Work system. - during the construction phase, Morven North construction areas will be clearly marked using buoys. - any dropped objects dropped on the seabed during works associated with Morven North will be reported and objects will be recovered where they pose a hazard to fishing or safe navigation, and where recovery is practicable. - FMMCP sets out procedure in relation to gear fastening, loss, damage for gear relocated/removed by gear owner. **Monitoring** Commitment to engaging with the East Region Commercial Fisheries Working Group (or equivalent) and other relevant parties to contribute to the development of a strategic,	

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
			regionally coordinated approach to commercial fisheries monitoring. **Communication** Throughout all phases of Morven North, the Applicant will remain committed to maintaining open dialogue and effective communication with the fishing industry.	
MM-19	Volume 2, Chapter 12: Commercial Fisheries	To appoint a Company Fisheries Liaison Officer (CFLO)	The Company Fisheries Liaison Officer (CFLO) will support ongoing liaison and ensure clear communication between the Applicant and commercial fishers. They will provide a point of contact to liaise and engage with the fishing industry and to facilitate productive relationships with commercial fishers.	Tertiary
MM-20	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 16: Other Sea Users and Communications	Installation of infrastructure over or adjacent to existing cables will be subject to crossing or proximity agreements between Morven North and other parties, prior to the start of the construction phase.	To ensure close communication and planning between both parties to ensure disruption of activities is reduced and coexistence is facilitated.	Tertiary
MM-21	Volume 2, Chapter 12: Commercial Fisheries	Member of and engagement in Regional Commercial Fisheries working groups.	Participation in the East Region Commercial Fisheries Working Group (or equivalent) and liaison with Fisheries Industry Representatives, as appropriate and adherence to recognised fisheries liaison good practice.	Tertiary
MM-23	Volume 2, Chapter 12: Commercial Fisheries	Development of and adherence to a Decommissioning Programme.	As required under Section 105 of the Energy Act 2004 (as amended by the Energy Act 2008 and the Scotland Act 2016). A decommissioning programme will consider best practice at the time of decommissioning.	Tertiary

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
MM-28	Volume 2, Chapter 18: Climate Change	The Offshore Substation Platform main high voltage electrical equipment will be located within an internal structure. Appropriate cooling plant will be designed to account for a range of temperature conditions.	Enables Morven North to be resilient to future climate change, in particular from the risk of overheating from temperature changes.	Primary
MM-29	Volume 2, Chapter 18: Climate Change	Application of anti-corrosion protective coatings, where appropriate and accounting for sea level rise.	Enables Morven North to be resilient to future climate change, in particular from the risk of increased sea temperatures, ocean acidification and sea level rise.	Primary
MM-33	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 13: Shipping and Navigation, and Volume 2, Chapter 16: Other Sea Users and Communications	An application for the use of safety zones of up to 500m during construction, periods of major maintenance, decommissioning and up to 50m for installed structures pre commissioning.	To protect third-party vessels from project vessels involved in construction and major maintenance activities, which may be Restricted in Ability to Manoeuvre (RAM_1).	Tertiary
MM-34	Volume 2, Chapter 13: Shipping and Navigation	Development of and adherence to a Lighting and Marking Plan (LMP).	To reduce impacts on aviation, shipping and offshore ornithology. The LMP will detail compliance with legal requirements including IALA G1162 (IALA, 2021), and will assist with SAR operations and will ensure that appropriate lighting and marking of wind turbines and offshore substation platforms will be established in accordance with Civil Aviation Authority (CAA) regulations and guidance (CAP 393 and the Air Navigation Order (ANO)) and in accordance with the Civil Aviation Authority CAA and the Defence Infrastructure Organisation (DIO), which is responsible for the safeguarding of Ministry of Defence	Primary

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
			(MOD) assets. Secured through the (LMP). The approach to Aids to Navigation will be outlined in the LMP. Adopting the LMP, and therefore reducing lighting to be compliant with MM-34, will provide the minimum amount and intensity of lighting that Morven North can legally have whilst remaining compliant with mandatory Health and Safety lighting requirements.	
MM-35	Volume 2, Chapter 18: Climate Change	Regular inspections to be carried out to assess wind turbine and offshore substation platform conditions.	Ensures resilience to future climate change, in particular from the risk of increased wear from sea level rise, extreme weather events and increased precipitation.	Primary
MM-36	Volume 2, Chapter 15: Aviation (Military and Civil)	Prior to the start of construction, the Ministry of Defence Aeronautical Information Documents Unit and United Kingdom Hydrographic Office (UKHO) will be provided with the information required for inclusion on aviation charts.	Prior to the start of construction, the Ministry of Defence Aeronautical Information Documents Unit and UKHO will be provided with the information required for inclusion on aviation charts.	Tertiary
MM-37	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 13: Shipping and Navigation, Volume 2, Chapter 16: Other Sea Users and Communications	Appropriate marking on UKHO Admiralty charts.	To maximise awareness of Morven North, allowing other vessels, sea users and marine infrastructure receptors to plan their activities in advance.	Tertiary
MM-38	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 13:	The construction and decommissioning area is marked by buoyage in	To protect third-party vessels from project vessels involved in construction and major maintenance activities, which may be RAM_1.	Tertiary

Reference Number	Relevant Chapter(s)	Designed in measures adopted as part of Morven North	Justification	Primary or tertiary
	Shipping and Navigation	agreement with the Northern Lighthouse Board (NLB).		
MM-39	Volume 2, Chapter 12: Commercial Fisheries, Volume 2, Chapter 13: Shipping and Navigation	Use of guard vessels as required.	To reduce potential conflict between Morven North and fishing activities by maximising awareness of temporary hazards.	Tertiary
MM-43	Volume 2, Chapter 13: Shipping and Navigation	A minimum blade tip clearance of 34 m above Lowest Astronomical Tide (LAT).	To reduce impact to seabirds as most seabirds fly close to the sea surface. Increasing the clearance between blade tip and sea surface reduces potential for collision. This minimum blade tip height clearance is considered appropriately conservative so as to reduce the risk of bird collisions in the specific circumstances of Morven North.	Primary
MM-44	Volume 2, Chapter 18: Climate Change	Design standards for structural safety will be in line with international requirements, with allowance for increased heights of extreme waves and sea level rise.	Ensure resilience to future climate change, in particular from the risk of increased wear from extreme weather events, sea level rise and wave heights.	Primary
MM-48	Volume 2, Chapter 12: Commercial Fisheries	Any objects dropped on the seabed during works associated with Morven North will be reported in line with MD-LOT procedures as set out in the Environmental Management Plan (EMP), and objects will be recovered where they pose a hazard to other marine users and where recovery is practicable.	Reporting of dropped objects is standard and follows Marine Directorate procedure to decrease the risk of fishing gear snagging.	Tertiary

19.9 Assessment of significant effects

19.9.1 Identification and screening

19.9.1.1 Following the guidance set out by IEMA (2020) and considering the location of Morven North, it has been identified as potentially vulnerable to major accidents and disasters. As a result, it has been included in the assessment presented in the Morven North EIA Report. Specific hazards have been excluded from further consideration where it has been determined that Morven North does not pose, or is not subject to, any significant vulnerability to such events. Hazards that have been scoped out are not discussed further in this chapter.

19.9.1.2 Despite the implementation of numerous designed-in measures and mitigation, a comprehensive assessment has been carried out to evaluate Morven North's vulnerability to major accidents and disasters, including consideration of Morven North's potential to contribute to such events.

19.9.2 Scoping

19.9.2.1 The scoping stage determines whether there is potential for LSE1 as a result of major accidents and disasters associated with Morven North considering the designed-in measures and mitigation presented in Table 19.9.

19.9.2.2 During the scoping stage, consideration was given to whether major accidents and disasters should be scoped in or out of the assessment stage for Morven North. Following the IEMA proforma (IEMA, 2020), hazards which met the criteria listed below have not been progressed to the risk assessment stage and are therefore scoped out of this chapter.

- Morven North is not vulnerable to the hazard, or will not cause the hazard;
- The hazard is unlikely to result in effects that causes a fatality, multiple fatalities, permanent injury, widespread of irreversible harm or damage, i.e. would not result in major accidents and disasters;
- there is either no credible pathway or receptor in terms of EIA Regulations;
- the accident involves a workplace hazard, which can only impact the workers undertaking the task such as falls from height or misuse of tools. This is considered to be an occupational health and safety incident which is managed through compliance with the Management of Health and Safety Work Regulations and not the intended purpose of EIA (see paragraph 19.9.2.3).

19.9.2.3 Under the IEMA proforma (IEMA, 2020), other existing sources of information were used to identify potential hazards on a regional and national scale. This included the National Risk Register (HM Government, 2025), and the Community Risk Register for North Scotland (Regional Resilience Partnership, 2024). In accordance with the IEMA proforma (IEMA, 2020), standalone risk assessments for major accidents and disasters have not been carried out, as sufficient publicly available data sources exist to inform characterisation of the baseline environment. The sources used are detailed in each of the technical chapters summarised in Section 19.5.1. As outlined in paragraph 19.9.2.2, workplace hazards fall outside the scope of this assessment, as they are addressed through applicable HSE legislation.

19.9.2.4 Table 19.10 presents the scoping of the vulnerability of Morven North to the existing baseline sources of hazards which have the potential for LSE[1]. In addition to the existing baseline hazards, Morven North may introduce additional pressures that could give rise to the potential for accidents to impact on the receiving environment, and these are presented in Table 19.11. Each source of hazard is assessed individually and scoped in or out of further assessment with justification provided in Table 19.10 and Table 19.11.

Table 19.10: Scoping of vulnerability of Morven North to existing major accidents and disasters

C= construction, O= O&M, D= decommissioning phases

"✓" is used to denote the phase the potential impact can occur, "×" outlines there is no impact within this project phase

Source of Hazard	Phase			Scoped in	Justification
	C	O	D		
Collision risk – shipping and navigation	✓	✓	✓	✓	Potential for collision risk from existing shipping and navigation receptors impacting on the construction, O&M and decommissioning of Morven North to result in major accidents and disasters (Volume 2, Chapter 13: Shipping and Navigation).
Collision risk – aviation (military and civil)	×	✓	×	✓	Potential for collision risk from existing aviation receptors in the area impacting on the O&M phase of Morven North to result in major accidents and disasters (Volume 2, Chapter 15: Aviation (Military and Civil)).
Snagging risk – commercial fisheries	✓	✓	✓	✓	Potential for snagging risk from existing commercial fisheries receptors impacting on the construction, O&M and decommissioning of Morven North to result in major accidents and disasters (Volume 2, Chapter 12: Commercial Fisheries).
Risk of accidents – cables and pipelines	✓	✓	✓	✓	Potential for major accidents and disasters related to cable and pipeline infrastructure to significantly impact on the construction, O&M and decommissioning of Morven North to result in major accidents and disasters (Volume 2, Chapter 16: Other Sea Users and Communications).
Risk of accident – oil and gas infrastructure	×	×	×	×	There are no active hydrocarbon blocks within the Local Other Sea Users, Marine Infrastructure and Communications Study Area and this hazard has therefore been scoped out for major accidents and disasters (Volume 2, Chapter 16: Other Sea Users and Communications).
Risk of accidents – COMAH establishments	×	×	×	×	The nearest COMAH site is Schlumberger Oilfield UK Limited (HSE, 2015) which is located approximately 62.8km northwest of Morven North and hence due to the separation distance there is negligible potential for this site to impact Morven North or vice versa and the hazard has been scoped out for major accidents and disasters.
Risk of accidents – extreme weather	×	×	×	×	Offshore wind turbines are designed to shut down during extreme weather conditions, such as during high wind speeds or severe storms to prevent structural damage and ensure safety. This operational safeguard is outlined in International Electrotechnical Commission (IEC) 61400-3-1 (IEC, 2019) and International Organisation for Standardisation (ISO) 19901-1 (ISO, 2015), which set international standards for wind turbine design and offshore resilience, including limits for safe operation and automatic shutdown protocols. Therefore, there is no significant risk of hazard or accident to Morven North and this hazard has been scoped out for major accidents and disasters (Volume 2, Chapter 18: Climate Change).
Temperature changes	×	×	×	×	Temperature changes are a critical factor in wind turbine design and operation. Standards such as ISO 19901-1 and IEC 61400-3-1 require turbines to be engineered to withstand site

Source of Hazard	Phase			Scoped in	Justification
	C	O	D		
					specific temperature ranges, including extreme cold or heat, to ensure structural integrity, material performance, and reliable operation under varying environmental conditions. Therefore, there is no significant risk of hazard or accident to Morven North and this hazard has been scoped out for major accidents and disasters (Volume 2, Chapter 18: Climate Change).
Sea level rise and storm surge	×	×	×	×	International standards, including ISO 19901-1 and IEC 61400-3-1, require offshore wind turbine platforms to be designed with adequate elevation to withstand storm surge, wave loading, and sea level rise, using site specific metocean data to guide safe and resilient structural design. Therefore, there is no significant risk of hazard or accident to Morven North and this hazard has been scoped out for major accidents and disasters (Volume 2, Chapter 18: Climate Change).
Precipitation changes	×	×	×	×	Given the offshore location of Morven North, precipitation change resulting from climate change has no potential for a significant hazard or accident to Morven North (as this is primarily associated with flood risk and water damage) and therefore this hazard has been scoped out for major accidents and disasters (Volume 2, Chapter 18: Climate Change).
Sabotage events	×	×	×	×	The UK government continues to implement methods of detection to monitor the likelihood of a terror attack in the UK, to ensure emergency response protocols are in place should such an attack happen. Morven North is unlikely to be vulnerable to this type of hazard and is no more vulnerable to this type of hazard than any other offshore development. The risk is considered to be very low but, should a sabotage event occur, any effects on water and air quality would dissipate quickly and would be isolated to a remote, offshore location. The implications of such events (e.g. marine and air pollution) would be dealt with at the UK level and could be reduced further through the implementation of measures set out in standard post-consent plans (e.g. MPCPs). Therefore, there is no significant risk of hazard or accident to Morven North and this hazard has been scoped out for major accidents and disasters.

Table 19.11: Scoping of vulnerability of Morven North to cause major accidents and disasters

C= construction, O= O&M, D= decommissioning phases

"✓" is used to denote the phase the potential impact can occur, "×" outlines there is no impact within this project phase

Source of Hazard	Phase			Scoped in	Justification
	C	O	D		
Collision and allision risk – shipping and navigation	✓	✓	✓	✓	Morven North comprises of an area approximately 511.1km^2 and is located approximately 61km from the Aberdeenshire coast. There will be a series of vessels required for all stages of Morven North, therefore there is potential for collision and allision involving said vessels to result in major accidents and disasters (Volume 2, Chapter 13: Shipping and Navigation). During the construction phase, up to 3,060 vessel return trips may be required with a maximum of 41 vessels on site at any one time. This is comprised of main installation and support vessels, tug and anchor handlers, cable lay installation and support vessels, guard vessels, survey vessels, seabed preparation vessels, Crew Transfer Vessels and scour protection installation vessels. Over the 35-year O&M phase, up to 353 vessel return trips may be required with a maximum of 19 vessels on site at any one time. Furthermore, the decommissioning sequence will generally be the reverse of the construction sequence and involve similar types and number of vessels and equipment.
Collision risk - aviation (military and civil)	×	✓	×	✓	Potential for collision risk between existing aviation receptors in the area and activities associated with the O&M phase of Morven North to result in major accidents and disasters (Volume 2, Chapter 15: Aviation (Military and Civil)).
UXO	✓	×	×	✓	UXO within the Morven North Boundary has the potential to result in major accidents and disasters. If detonated, it could cause significant adverse impact to human health and existing assets in the vicinity such as Morven North infrastructure and third-party property (Volume 2, Chapter 10: Marine Mammals).
Pollution of the marine environment (vessels)	✓	✓	✓	✓	During all phases of Morven North, there is potential for pollution of the marine environment resulting from vessels associated with Morven North to result in major accidents and disasters (Volume 2, Chapter 13: Shipping and Navigation). During the O&M phase of Morven North, up to 353 vessel return trips may be required. When considered alongside vessel activity during the construction and decommissioning phases, the presence of fuels, oils, and lubricants onboard presents a potential risk to the marine environment in the event of a major spill (Volume 2, Chapter 13: Shipping and Navigation).
Fire at wind turbines/OSPs	✓	✓	✓	✓	During all phases of Morven North, there is potential for fire at wind turbine or at the OSPs to result in major accidents and disasters. Fires could be caused by electrical system faults, explosions, lightning strikes and therefore must be considered in this assessment.

Source of Hazard	Phase			Scoped in	Justification
	C	O	D		
Snagging risk – commercial fisheries	✓	✓	✓	✓	Potential of snagging risk (damage or loss of fishing gear) to existing commercial fisheries receptors in the vicinity impacting from the construction, O&M and decommissioning phases of Morven North to result in major accidents and disasters (Volume 2, Chapter 12: Commercial Fisheries).
Pollution of the marine environment (structures)	×	×	×	×	The quantity of chemicals in any Morven North structure is too low to result in any credible major accidents and disasters resulting from pollution. The risk of such events is managed by the implementation of measures set out in standard post-consent plans (e.g. Volume 4, Annex 1: Environmental Management Plan (EMP) (Version 1), and Volume 4, Annex 1.1: Marine Pollution Contingency Plan (MPCP) (Version 1)). These plans include planning for accidental spills, address all potential contaminant releases and include key emergency contact details. They will also set out industry good practice and Oslo and Paris Commissions (OSPAR), IMO and International Convention for the Prevention of Pollution from Ships (MARPOL) guidelines for preventing pollution at sea. The impact of pollution events is also considered separately for marine ecology receptors in the relevant chapters of the Morven North EIA Report. Therefore, there is no significant risk of hazard or accident to Morven North and this hazard has been scoped out for major accidents and disasters.

19.9.3 Assessment

19.9.3.1 In line with IEMA (2020) guidance, all scoped in risk events identified in Table 19.10 and Table 19.11 have been assessed and summarised in Table 19.12. This assessment considers both Morven North's vulnerability to existing major accidents and disasters, and its potential to cause such events. The evaluation also incorporates multidisciplinary impacts, designed-in measures and mitigation, and the potential need for secondary mitigation to determine whether each risk event is being managed to ALARP. As part of this evaluation process, the 'conclusion' column in Table 19.12 was introduced to align with the LSE1 terminology requested by MD-LOT in the Scoping Opinion (MD-LOT, 2023).

19.9.3.2 Table 19.12 presents the outcomes of this assessment, detailing both the vulnerability of Morven North and its potential to cause major accidents and disasters. It has been determined that there is no LSE1 for any of the identified risk events presented in Table 19.12.

Table 19.12: Assessment of vulnerability of and potential for Morven North to be impacted or cause major accidents and disasters

Risk event	Source and/or pathway	Receptor(s)	Source document[1]	Reasonable worst consequence if event did occur?	Are cross disciplinary impacts likely?	Designed-in measures and mitigation	Could this reasonably[2] lead to a major accident and disaster with existing control measures in place?	Is the reasonable worst consequence managed to an acceptable level with existing control measures in place?	Conclusion
Vulnerability of Morven North to existing major accidents and disasters									
Collision risk – shipping and navigation	Source: other vessels Pathway: overlapping marine environment (vessel routes)	Project vessels and infrastructure	Volume 2, Chapter 13: Shipping and Navigation	Severe damage to vessel/s, personal injury, and loss of fuel/cargo inventory to marine environment	Yes – inventory loss could result in impact to various marine disciplines	As detailed in Table 19.9 and Volume 2, Chapter 13: Shipping and Navigation ERCoP	No	Yes	No LSE[1]
Collision risk – aviation (military and civil)	Source: low flying aircrafts Pathway: airspace above project area	Project surface and infrastructure	Volume 2, Chapter 15: Aviation (Military and Civil)	Severe damage to surface infrastructure e.g. wind turbines	No	As detailed in Table 19.9 and Volume 2, Chapter 15: Aviation (Military and Civil) ERCoP	No	Yes	No LSE[1]
Snagging risk – commercial fisheries	Source: commercial fishing vessels Pathway: overlapping areas for commercial fishing	Project subsea infrastructure	Volume 2, Chapter 12: Commercial Fisheries	Severing of cable connection, damage to cable	No	As detailed in Table 19.9 and Volume 2, Chapter 12: Commercial Fisheries	No	Yes	No LSE[1]
Risk of accidents – cables and pipelines	Source: other vessels Pathway: overlapping cable and pipeline routes	Project infrastructure	Volume 2, Chapter 16: Other Sea Users and Communications	Severing of cable connection, damage to cable	No	As detailed in Table 19.9 and Volume 2, Chapter 16: Other Sea Users and Communications	No	Yes	No LSE[1]
Vulnerability of Morven North to cause major accidents and disasters									
Collision and allision risk – shipping and navigation	Source: project vessels and infrastructure Pathway: overlapping marine environment	Other vessels	Volume 2, Chapter 13: Shipping and Navigation	Severe damage to or loss of vessel and loss of fuel/cargo inventory to marine environment	Yes – inventory loss could result in impact to various marine disciplines	As detailed in Table 19.9 and Volume 2, Chapter 13: Shipping and Navigation ERCoP	No	Yes	No LSE[1]

[1] The source document is the assessment chapter which details how this risk is managed.

[2] The reasonable worst-case scenario anticipated, considering the likely severity and duration. A reasonable worst-case scenario is the worst plausible, not most likely, manifestation of the risk in question.

Risk event	Source and/or pathway	Receptor(s)	Source document[1]	Reasonable worst consequence if event did occur?	Are cross disciplinary impacts likely?	Designed-in measures and mitigation	Could this reasonably[2] lead to a major accident and disaster with existing control measures in place?	Is the reasonable worst consequence managed to an acceptable level with existing control measures in place?	Conclusion
Collision risk - aviation (military and civil)	Source: low flying aircrafts Pathway: airspace above project area	Other aircrafts	Volume 2, Chapter 15: Aviation (Military and Civil)	Loss of aircraft, loss of life and damage to project infrastructure	Yes – inventory loss could result in impact to various marine disciplines	As detailed in Table 19.9 and Volume 2, Chapter 15: Aviation (Military and Civil) ERCoP	No	Yes	No LSE[1]
UXO	Source: ordnance detonation Pathway: overlapping marine environment	Marine mammals, fish and shellfish, benthic ecology, human health, existing third-party vessels and project vessels and infrastructure	Volume 2, Chapter 10: Marine Mammals	Injury and disturbance to marine mammals, fish and shellfish and benthic ecology from elevated underwater noise during UXO detonation. Physical impact to third-party vessels and property as well as the Morven North through uncontrolled explosions.	Yes – injury and disturbance to marine mammals, fish and shellfish and benthic ecology. Potential impact on human health. Potential impact on water quality in the event of any fuel/chemical loss and subsequent impact on biodiversity. Damage to material assets.	As detailed in Table 19.9 and Volume 2, Chapter 10: Marine Mammals ERCoP	No	Yes	No LSE[1]
Pollution of the marine environment (vessels)	Source: project vessels Pathway: overlapping marine environment	Marine mammals, fish and shellfish, and benthic ecology	Volume 2, Chapter 13: Shipping and Navigation	Severe damage to vessel and loss of fuel or cargo inventory to marine environment	Yes – inventory loss could result in impact to various marine disciplines	As detailed in Table 19.9 and Volume 2, Chapter 13: Shipping and Navigation, alongside adherence to Volume 4, Annex 1: Environmental Management Plan (EMP) (Version 1) and Volume 4, Annex 1.1: Marine Pollution Contingency Plan (MPCP) (Version 1) ERCoP	No	Yes	No LSE[1]
Fire at wind turbines/OSPs	Source: OSP or Wind Turbine fire Pathway: overlapping marine environment and atmosphere	Water and air quality	Morven Site Scoping Report	Short-term, localised impact to water quality Measurable atmospheric emissions	Yes – fire could result in impacts to air and water quality	All potential air quality impacts were scoped out of further assessment (MvOWL, 2023)	No	Yes	No LSE[1]
Snagging risk – commercial fisheries	Source: project subsea infrastructure Pathway: overlapping marine environment	Commercial fishing vessels	Volume 2, Chapter 12: Commercial Fisheries	Severe damage to or loss of fishing equipment and personal injury	No	As detailed in Table 19.9 and Volume 2, Chapter 12: Commercial Fisheries, alongside Volume 4, Annex 1.3: Scour Protection Management Plan (SPMP) (Version 1). Cable Plan	No	Yes	No LSE[1]

19.10 Cumulative, transboundary and inter-related effects assessment

19.10.1.1 As it has been concluded that Morven North will not reasonably lead to any major accidents and disasters after consideration of the designed-in measures and mitigation adopted, and as no significant effects are predicted at the project level, there is no pathway for cumulative, inter-related or transboundary effects to arise. Therefore, no further assessment of such effects has been undertaken.

19.11 Summary of impacts, mitigation, likely significant effects and monitoring

19.11.1.1 Information on major accidents and disasters within the Morven North Major Accidents and Disasters Study Area was collected through a detailed desktop review of existing studies and datasets from the following technical chapters:

- Volume 2, Chapter 12: Commercial Fisheries;
- Volume 2, Chapter 13: Shipping and Navigation;.
- Volume 2, Chapter 15: Aviation (Military and Civil);
- Volume 2, Chapter 16: Other Sea Users and Communications;
- Volume 2, Chapter 18: Climate Change.

19.11.1.2 During the scoping stage of the assessment, all potential major accidents and disasters associated with Morven North were identified and its vulnerability to such events was evaluated (Table 19.12). The assessment concluded that all reasonably foreseeable worst-case scenarios can be effectively managed to an acceptable level through the implementation of existing control measures, and that there is no LSE[1] for any of the identified risk events presented in Table 19.12. As Morven North is not expected to result in any major accidents or disasters following the incorporation of designed-in measures and adopted mitigation, an assessment of cumulative effects was not considered necessary.

19.11.1.3 A transboundary assessment was not required for Morven North, as there was no basis to indicate likely significant transboundary effects.

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