



Morven Hawthorn Pit Grid Connection Project

Preliminary Environmental Information Report

Volume 2, Chapter 8: Shipping and Navigation

MVCNS-J4029-ATC-00001
October 2026
B01

Document status

Version	Purpose of document	Authored by	Checker	Approved by	Date
B01	PEIR	Anatec	LL	LS	October 2026

Prepared by:	Prepared for:
Anatec	Morven Offshore Wind Limited

Table of contents

8	Shipping and Navigation.....	1
8.1	Introduction	1
8.2	Legislative and policy context	1
8.3	Consultation and engagement	7
8.4	Baseline characterisation	10
8.5	Impact assessment methodology.....	26
8.6	Key parameters for assessment	29
8.7	Commitments adopted as part of the MHPGC Project	47
8.8	Assessment of impacts	52
8.9	Whole project assessment and Cumulative Effects Assessment methodology	69
8.10	Whole project assessment and Cumulative Effects Assessment	85
8.11	Transboundary effects.....	131
8.12	Inter-related effects.....	131
8.13	Summary.....	131
8.14	References	135

List of tables

Table 8.1: Summary of the NPS provisions relevant to shipping and navigation	3
Table 8.2: Marine planning policy relevant to shipping and navigation	5
Table 8.3: Summary of scoping responses relevant to shipping and navigation.....	7
Table 8.4: Summary of further consultation and engagement.....	9
Table 8.5: Summary of key desktop reports used to characterise the shipping and navigation baseline	13
Table 8.6: Frequency of occurrence ranking definitions.....	26
Table 8.7: Definition of terms relating to the severity of consequence	27
Table 8.8: IMO FSA risk matrix used for the assessment of the significance of the effect	27
Table 8.9: Significance definitions	28
Table 8.10: Summary of terminology differences between EIA and NRA for shipping and navigation	28
Table 8.11: Impacts scoped into the assessment	29
Table 8.12: Impacts scoped out of the assessment	30
Table 8.13: MDS relevant for the assessment of potential impacts on shipping and navigation	31
Table 8.14: Embedded commitments relevant to shipping and navigation implemented as part of the MHPGC Project	48
Table 8.15: Scenarios to be considered in the MHPGC Project whole project assessment and cumulative effects assessment for Shipping and Navigation	69
Table 8.16: List of other projects and plans considered within the Cumulative Effects Assessment for Shipping and Navigation	71
Table 8.17: MDS considered for the whole project and cumulative effects assessments on shipping and navigation.....	76

Table 8.18: Whole project assessment for increased vessel to vessel collision risk (MHPGC Project vessel to third-party).....	86
Table 8.19: Morven Programme assessment for increased vessel to vessel collision risk (MHPGC Project vessel to third-party).....	87
Table 8.20: CEA for increased vessel to vessel collision risk (MHPGC Project vessel to third-party).....	89
Table 8.21: Whole project assessment for increased vessel to vessel collision risk (third-party to third-party)	92
Table 8.22: Morven Programme assessment for increased vessel to vessel collision risk (third-party to third-party)	93
Table 8.23: CEA for increased vessel to vessel collision risk (third-party to third-party)	94
Table 8.24: Whole project assessment for reduced access to local ports and harbours	98
Table 8.25: Morven Programme assessment for reduced access to local ports and harbours	99
Table 8.26: CEA for reduced access to local ports and harbours	100
Table 8.27: Whole project assessment for disruption to third-party marine activities	103
Table 8.28: Morven Programme assessment for disruption to third-party marine activities.....	104
Table 8.29: CEA for disruption to third-party marine activities.....	106
Table 8.30: Whole project assessment for reduction in under keel clearance.....	109
Table 8.31: Morven Programme assessment for reduction in under keel clearance	110
Table 8.32: CEA for reduction in under keel clearance	112
Table 8.33: Whole project assessment for anchor interaction with subsea cables	115
Table 8.34: Morven Programme assessment for anchor interaction with subsea cables	116
Table 8.35: CEA for anchor interaction with subsea cables	118
Table 8.36: Whole project assessment for fishing gear interaction with subsea cables	121
Table 8.37: Morven Programme assessment for fishing gear interaction with subsea cables	122
Table 8.38: CEA for fishing gear interaction with subsea cables	124
Table 8.39: Whole project assessment for interference with navigation, communications and position-fixing equipment	127
Table 8.40: Morven Programme assessment for interference with navigation, communications and position-fixing equipment.....	128
Table 8.41: CEA for interference with navigation, communications and position-fixing equipment	129
Table 8.42: Summary of potential impacts and residual effects	132

List of figures

Figure 8.1: MHPGC Project REIR Red Line Boundary Shipping and Navigation Study Area	12
Figure 8.2: Key Navigational features in proximity to MHPGC Project PEIR Red Line Boundary	16
Figure 8.3: RNLI lifeboat stations and incidents by vessel type (2016 to 2025)	18

Figure 8.4: Overview of vessel traffic movements within the Shipping and Navigation Study Area (12 months, 2024 to 2025)	21
Figure 8.5: Vessel density within Shipping and Navigation Study Area (12 months, 2024 to 2025)	22
Figure 8.6: Anchored vessels within Shipping and Navigation Study Area (12 months, 2024 to 2025)	24

Annexes

Annex number	Annex title
8.1	Navigational Risk Assessment
8.2	Cable Burial Risk Assessment
8.3	Marine EMF Compass and Deviation Report

Glossary

Term	Meaning
Automatic Identification System (AIS)	A system by which vessels automatically broadcast their identity and key statistics including location, destination, length, speed and current status. Most commercial vessels and EU fishing vessels over 15 m in length are required to carry AIS.
Advisory Safe Passing Distances	Advisory safe passing distance to discourage vessels from passing close to sensitive activities such as the laying of cable.
Baseline	Existing conditions as represented by the latest available data, whether from literature or survey and used as a benchmark for making comparisons to assess the impact of a development or project.
Collision	The act or process of colliding (crashing) between two moving objects.
Commitments	Measures (embedded mitigation and secondary) to be adopted during the construction, operation and maintenance and decommissioning phases of the MHPGC Project.
Cumulative effect	Likely significant effects resulting from MHPGC Project assessed together with effects from one or more different projects and plans on the same receptor/resource.
Cumulative Effects Assessment (CEA)	Assessment of the likely effects arising from the MHPGC Project alongside the likely effects arising from other proposed developments on the same receptor or resource.
Electromagnetic Field (EMF)	An electric and magnetic force field that surrounds a moving electrical charge.
Embedded mitigation	Measures included as part of the project design. Includes both primary and tertiary mitigation.
Environmental Impact Assessment (EIA)	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Formal Safety Assessment (FSA)	A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity as defined by the International Maritime Organisation (IMO).
Inter-related effects	Effects that may arise from the interactions between different topic effects considered within the alone assessment, potentially leading to more significant effects than if they were to be considered in isolation.
Landfall	The area in which the offshore export cables make landfall (come onshore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area between the trenchless technique exit pits and the transition joint bay (TJB) inclusive of all construction works.
Marine Directorate Licensing Operations Team (MD-LOT)	The part of the Scottish Government's Marine Directorate responsible for assessing and administering applications for marine licences and Section 36 consent (offshore) in Scotland.

Term	Meaning
Marine Guidance Note (MGN)	A system of guidance notes issued by the Maritime and Coastguard Agency (MCA) which provide significant advice relating to the improvement of the safety of shipping at sea, and to prevent or minimise pollution from shipping.
Marine Management Organisation (MMO)	The MMO, as a UK government body, is responsible for licensing, regulating and overseeing activities in the marine environment for English waters. For a DCO and deemed marine licence, the MMO acts as a statutory consultee, advising on marine planning, environmental impacts, habitats and compliance with marine licensing regulations.
Maximum design scenario (MDS)	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the MHPGC Project.
Mean High Water Springs (MHWS)	The most inshore level location reached by the sea at high tide during mean high water spring tide. This is defined as the average tidal height throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest.
MHPGC Project PEIR Red Line Boundary	The area within which all components of the MHPGC Project will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds).
MHPGC Project Preliminary Environmental Information Report (PEIR)	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of project and which helps to inform consultation responses.
MHPGC Project Scoping Opinions	Separate scoping opinions received from PINS (on behalf of the Secretary of State) and MD-LOT (on behalf of the Scottish Ministers) in response to the MHPGC Project Scoping Report. The MHPGC Project Scoping Opinions contain the range of issues that PINS, and MD-LOT in consultation with statutory stakeholders, have identified should be considered within the EIA process.
MHPGC Project Scoping Report	A Scoping Report for the MHPGC Project, scoping the likely significant effects of the project on the environment, was submitted and accepted by Planning Inspectorate (PINS) and submitted to the Scottish Ministers, via the Marine Directorate – Licencing Operations Team (MD-LOT) in February 2025.
Morven Branxton Area Grid Connection Project (hereafter 'MBAGC Project')	The Morven Branxton Area Grid Connection Project will be comprised of the offshore export cable in Scottish waters from the Morven North or the Morven South Offshore Substation Platforms, the onshore export cable and the onshore land substation in the vicinity of Branxton in East Lothian, Scotland.
Morven Hawthorn Pit Grid Connection Project	The MHPGC Project is comprised of the offshore export cables in Scottish and English waters from the Morven North or the Morven South offshore substation platform(s) (OSP), landfall, onshore export cables, the onshore land substation (LSS) and AC connection cables. Also referred to in this report as the MHPGC Project, for ease of reading.

Term	Meaning
Morven North Offshore Wind Array Project (hereafter 'Morven North')	The Morven North Offshore Wind Array Project which includes the wind turbines and foundations, Offshore Substation Platforms and foundations, inter-array and interconnector cables and associated infrastructure located within the Morven North Boundary.
Morven Programme	The Morven Programme comprises the MHPGC Project, Morven North, Morven South and MBAGC Project collectively.
Morven South Offshore Wind Array Project (hereafter 'Morven South')	The Morven South Offshore Wind Array Project, which includes the wind turbines and foundations, Offshore Substation Platforms and foundations, inter-array and interconnector cables and associated infrastructure located within the Morven South Boundary.
Navigational Risk Assessment (NRA)	A document which assesses the hazards to shipping and navigation of a proposed subsea cable based upon a Formal Safety Assessment.
Offshore export cable corridor	The proposed corridor in which the offshore export cables will be located, from either the Morven North or Morven South offshore substation platform to the transition joint bay (TJB) at landfall.
Offshore export cables	High Voltage Direct Current (HVDC) cables which bring electricity from either the Morven North or Morven South offshore substation platform to the TJB at landfall.
Offshore substation platforms (OSPs)	OSP(s) comprise the support structure, topside and electrical components used for collecting the electricity generated by the wind turbine generators, in Scottish waters, for the passage or transmission to landfall. These OSP(s) can be divided into two types: • High Voltage Alternating Current (HVAC) collector substations; • HVDC converter substations.
Primary mitigation	Measures included as part of the location or design of the MHPGC Project made during the pre-application phase that are an inherent part of the MHPGC Project and do not require additional action to be taken. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the MHPGC Project, the parameters and associated commitments secured by the DCO and marine licence, or both.
Residual effects	Effects that continue to exist after mitigation has been applied.
Secondary mitigation	Actions that will require further activity to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management plan. For secondary mitigation measures, both pre-mitigation and residual effects are presented.
Tertiary mitigation	Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.

Term	Meaning
the Study Area	For each environmental topic, the baseline environment will be characterised, and the likely significant effect will be described within a topic-specific Study Area. Specific Study Areas are defined for each topic and are based on the maximum spatial extent across which likely significant effects of the MHPGC Project may be experienced by the relevant receptors (i.e. Zone of Influence (Zol)).
Transboundary effects	Assessment of likely significant effects resulting from MHPGC Project on the interests of another European Economic Area (EEA) state(s).
Transboundary impact	Potential impacts resulting from MHPGC Project and affecting another European Economic Area (EEA) state.
Transition Joint Bay (TJB)	An underground bay housing a joint which connects the offshore export cables to the onshore export cables. The TJB will be located in the vicinity of the onshore side of the landfall.
Unique vessel	An individual vessel identified on any particular calendar day, irrespective of how many tracks were recorded for that vessel on that day. This prevents vessels being over counted. Individual vessels are identified using their Maritime Mobile Service Identity (MMSI).
Vessel Monitoring System (VMS)	A system used in commercial fishing to allow environmental and fisheries regulatory organisations to monitor, minimally, the position, time at a position and course and speed of fishing vessels.

Acronyms

Acronym	Meaning
AIS	Automatic Identification System
ALARP	As Low As Reasonably Probable
CBRA	Cable Burial Risk Assessment
CD	Chart Datum
CEA	Cumulative Effects Assessment
Cefas	Centre for Environmental Fisheries and Aquaculture Science
CFLO	Company Fisheries Liaison Officer
CLV	Cable laying vessel
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
CSIP	Construction Specification and Installation Plan
CSV	Construction Support Vessel
CTV	Crew Transport Vessel
DCO	Development Consent Order
DESNZ	Department for Energy Security and Net Zero
DfT	Department for Transport
DSV	Dive Support Vessel

Acronym	Meaning
EIA	Environmental Impact Assessment
EMF	Electromagnetic field
ERCoP	Emergency Response Co-operation Plan
ES	Environmental Statement
FLO	Fisheries Liaison Officer
FLOWW	Fishing Liaison with Offshore Wind and Wet Renewables Group
FPSO	Floating Production, Storage and Offloading
FSA	Formal Safety Assessment
GLA	General Lighthouse Authority
GV	Guard vessel
HM Government	His Majesty's Government
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IEMA	Institute of Environmental Management and Assessment
IMO	International Maritime Organization
ISEP	Institute of Sustainability and Environmental Professionals
ISV	Installation Support Vessel
MAIB	Marine Accident Investigation Branch
MBAGC	Morven Branxton Area Grid Connection
MCA	Maritime and Coastguard Agency
MD-LOT	Marine Directorate Licensing Operations
MDS	Maximum Design Scenario
MEAC	Marine Emergency Action Card
MGN	Marine Guidance Note
MHPGC	Morven Hawthorn Pit Grid Connection
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MPCP	Marine Pollution Contingency Plan
MPS	Marine Policy Statement
NLB	Northern Lighthouse Board
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRA	Navigational Risk Assessment
NRW	Natural Resources Wales
NSP	Navigational Safety Plan

Acronym	Meaning
NtM	Notice to Mariner
OEMP	Offshore Environmental Management Plan
O&M	Operation and maintenance
OREI	Offshore Renewable Energy Installation
OSP	Offshore substation platform
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PLGR	Pre-Lay Grapnel Run
PLL	Potential Loss of Life
RAF	Royal Air Force
RAM	Restricted in ability to manoeuvre
RNLI	Royal National Lifeboat Institution
RoPax	Roll-On/Roll-Off Passenger
RoRo	Roll-On/Roll-Off
RYA	Royal Yachting Association
SAR	Search and Rescue
SNCB	Statutory Nature Conservation Body
SOLAS	International Convention for the Safety of Life at Sea
SOV	Service Operation Vessel
TCE	The Crown Estate
TCES	The Crown Estate Scotland
TSV	Trenching Support Vessel
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
USV	Unmanned Survey Vessel
VMS	Vessel Monitoring System
VTMP	Vessel Traffic Management Plan

Units

Unit	Meaning
GT	Gross tonne
km	Kilometre
m	Metre
nm	Nautical mile

8 Shipping and Navigation

8.1 Introduction

- 8.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary findings of the Environmental Impact Assessment (EIA) work undertaken to date for the Morven Hawthorn Pit Grid Connection Project (hereafter 'MHPGC Project'), as described in **Volume 1, Chapter 2: Project Description, of the PEIR**.
- 8.1.1.2 The chapter considers the potential impacts and effects on shipping and navigation that could result from the construction, operation and maintenance (O&M) and decommissioning phases of the MHPGC Project. Specifically, it relates to the offshore elements of the MHPGC Project from the offshore substation platform(s) (OSPs) within Morven North Offshore Wind Array Project or Morven South Offshore Wind Array Project (hereafter 'Morven North and Morven South') located within Scottish offshore waters, transiting through English offshore and inshore waters, to Mean High Water Springs (MHWS) at Landfall.
- 8.1.1.3 This chapter describes the methodology, datasets that have informed the preliminary assessment, baseline conditions, including future baseline, commitments and the preliminary residual significant effects on shipping and navigation that could result from the MHPGC Project.
- 8.1.1.4 The assessment is informed by the following chapters:
- **Volume 1, Chapter 2: Project Description, of the PEIR;**
 - **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR;**
 - **Volume 1, Chapter 5: Policy and Legislation, of the PEIR;**
 - **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR;**
 - **Volume 2, Chapter 10: Infrastructure and Other Sea Users, of the PEIR;**
 - **Volume 4, Chapter 5: Inter-related Effects, of the PEIR.**
- 8.1.1.5 The chapter also draws on information contained within the following annexes:
- **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR;**
 - **Volume 1, Annex 4.2: Transboundary Screening, of the PEIR;**
 - **Volume 1, Annex 4.3: Cumulative Screening and Location Plan, of the PEIR;**
 - **Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR;**
 - **Volume 2, Annex 8.2: Cable Burial Risk Assessment, of the PEIR.**
 - **Volume 2, Annex 8.3: Marine EMF Compass and Deviation Report, of the PEIR.**
- 8.1.1.6 This PEIR will offer a comprehensive overview of the MHPGC Project's potential environmental impacts and commitments, presenting essential data to stakeholders for review and feedback. The PEIR will also be informed by the ongoing pre-application consultation process.
- 8.1.1.7 Following statutory consultation, comments will be reviewed and considered, where appropriate, in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate (PINS) for development consent and a marine licence application to Marine Directorate Licensing Operations Team (MD-LOT).

8.2 Legislative and policy context

8.2.1 Overview

- 8.2.1.1 The full relevant legislation and policy context for the MHPGC Project has been detailed in **Volume 1, Chapter 5: Policy and Legislation, of the PEIR**. This section sets out the legislation and planning policy that is relevant to the shipping and navigation assessment.

8.2.2 Legislation

International legislation

United Nations Convention on the Law of the Sea

- 8.2.2.1 The United Nations Convention on the Law of the Sea (UNCLOS) (UNCLOS, 1982) defines the rights and responsibilities of all nations with respect to their use of the sea throughout the world. Article 60(7) states, "Artificial islands, installations and structures and the safety zones around them may not be established where interference may be caused to the use of recognised sea lanes essential to international navigation".
- 8.2.2.2 UNCLOS is considered fully throughout this PEIR chapter. Particular regard is given to internationally recognised sea lanes (main commercial routes) which are considered an important element of the shipping and navigation baseline presented in **Section 8.4** and have been considered when assessing the significance of impacts in **Section 8.8**.

Convention on the International Regulations for Preventing Collisions at Sea

- 8.2.2.3 The Convention on the International Regulations for Preventing Collisions at Sea (COLREGs) (International Maritime Organization (IMO), 1972/77) defines the rules which must be adhered to by all vessels navigating internationally. Rule 8 Part (a) states, "Any action taken to avoid collision shall be taken in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship".
- 8.2.2.4 The COLREGs are considered in full throughout this PEIR chapter with particular regard to responsibilities between vessels (Rule 18) when considering port access and collision risk relating to MHPGC Project vessels in the impact assessment contained within **Section 8.8**.

International Convention for the Safety of Life at Sea

- 8.2.2.5 The International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974) is an international agreement that sets basic minimum criteria for all seafarers, dependent on the size and type of vessel. Regulation 33 of Chapter V Safety of Navigation states, "The master of a ship at sea which is in a position to be able to provide assistance on receiving a signal from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance".
- 8.2.2.6 SOLAS Chapter V is considered in full throughout this PEIR chapter with particular regard given to rendering assistance to persons in distress (Regulation 33) and passage planning (Regulation 34) when considering collision risk and anchor interaction in the impact assessment contained within **Section 8.8**.

National legislation

Submarine Telegraph Act 1885

- 8.2.2.7 Article II of the Submarine Telegraph Act (United Kingdom (UK) Government, 1885) states, "It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for damages." This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable.
- 8.2.2.8 This has been taken into consideration in the assessment of impacts from anchors or fishing gear in **Section 8.8**.

8.2.3 National policy context

National Policy Statements

- 8.2.3.1 National Policy Statements (NPS) set out the primary policy framework for a Development Consent Order (DCO) under which the MHPGC Project will be considered. This framework includes guidelines, requirements and criteria that the MHPGC Project must meet to obtain consent and proceed with development. **Table 8.1** provides details of the NPS relevant to shipping and navigation and how and where they are covered in the PEIR:

- NPS for energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2025a);
- NPS for renewable energy infrastructure (EN-3) (DESNZ, 2025b);
- NPS for electricity networks infrastructure (EN-5) (DESNZ, 2025c).

Table 8.1: Summary of the NPS provisions relevant to shipping and navigation

Summary of relevant NPS provisions	How and where considered in the PEIR
NPS EN-1	
Section 4.1.20: “Early engagement both before and at the formal pre-application stage between the applicant and key stakeholders, including public regulators, Statutory Consultees (including Statutory Nature Conservation Bodies (SNCBs)), and those likely to have an interest in a proposed energy infrastructure application, is strongly encouraged in line with the Government’s pre-application guidance. This means that only applications which are fully prepared and comprehensive can be accepted for examination, enabling them to be properly assessed by the Examining Authority and leading to a clear recommendation report to the Secretary of State.”	Consultation with relevant stakeholders, including the Maritime and Coastguard Agency (MCA), Trinity House and Northern Lighthouse Board (NLB), as well as other relevant shipping and navigation stakeholders has informed the assessment, and is detailed in Section 8.3. The Applicant will continue to engage with relevant stakeholders through the appropriate stages of the MHPGC Project.
NPS EN-3	
Section 2.8.158: “Applicants should engage with interested parties in the navigation sector early in the pre-application phase to help identify mitigation measures to reduce navigational risk to As Low As Reasonably Probable (ALARP). This includes the Marine Management Organisation (MMO) or Natural Resources Wales (NRW) in Wales, MCA, the relevant General Lighthouse Authority (GLA), such as Trinity House, the relevant industry bodies (both national and local) and any representatives of recreational users of the sea, such as the Royal Yachting Association (RYA), who may be affected. This should continue throughout the life of the development including during the construction, operation and decommissioning phases.”	Consultation with relevant stakeholders, including the MCA, Trinity House, NLB, RYA Scotland, Port of Seaham and DFDS Seaways has informed the assessment, and is detailed in Section 8.3. The Applicant will continue to engage with relevant stakeholders through the appropriate stages of the MHPGC Project.
Section 2.8.161: “Prior to undertaking assessments, applicants should consider information on internationally recognised sea lanes, which is publicly available.”	There are no internationally recognised sea lanes within the baseline environment [see in Section 8.4]. However, consideration is given to established main commercial routes as highlighted in Section 8.4, and considered throughout the impact assessment presented in Section 8.8.
Section 2.8.162: “Applicants must undertake a Navigational Risk Assessment (NRA) in accordance with relevant government guidance prepared in consultation with the MCA and other navigation stakeholders.”	An NRA has been undertaken and is included in Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR. This is considered the technical annex informing this PEIR chapter.
Section 2.8.170: “Prior to the submission of an application involving the development of the seabed, applicants should engage with key stakeholders, such as The Crown Estate (TCE) and statutory bodies to ensure they are aware of any current or emerging interests on or underneath the seabed which might give rise to a conflict with a specific application. This will ensure adequate opportunity to reduce potential conflicts and increase time to find a resolution.”	Consultation with relevant stakeholders, including the MCA, Trinity House and NLB, as well as other relevant shipping and navigation stakeholders has informed the assessment, and is detailed in Section 8.3. This includes requests for input to the cumulative effects assessment (CEA) in terms of relevant developments to be considered. The Applicant will continue to engage with relevant stakeholders such as TCE through the appropriate stages of the MHPGC Project.

Summary of relevant NPS provisions	How and where considered in the PEIR
Section 2.8.293: “The Secretary of State should not grant development consent in relation to the construction or extension of an offshore wind farm or offshore transmission infrastructure project if it considers that interference with the use of recognised sea lanes essential to international navigation is likely to be caused by the development.”	Routeing traffic has been characterised as part of the baseline in Section 8.4 and subsequently considered throughout the impact assessment presented in Section 8.8.
Section 2.8.295: “The Secretary of State should be satisfied that the site selection has been made with a view to avoiding or minimising disruption or economic loss to the shipping and navigation industries, with particular regard to approaches to ports and to strategic routes essential to regional, national and international trade, lifeline ferries and recreational users of the sea.”	Shipping and navigation interests have been considered as part of the site selection process summarised in Volume 1, Chapter 3: Site Selection & Consideration of Alternatives, of the PEIR and key ports, vessel operators and recreational bodies have been consulted as detailed in Section 8.3.
Section 2.8.296: “Where after carrying out a site selection, a proposed development is likely adversely to affect major commercial navigation routes, for instance by causing appreciably longer transit times, the Secretary of State should give these adverse effects substantial weight in its decision making.”	Commitments adopted as part of the MHPGC Project include a CSIP which identifies burial and protection options, based on seabed conditions to uphold navigational safety, as detailed in Section 8.7. Therefore, major commercial navigation routes are not anticipated to be disrupted in the long-term and no such impact has subsequently been scoped in.
Section 2.8.297: “Where a proposed offshore wind farm or offshore transmission infrastructure project is likely to affect less strategically important shipping routes, the Secretary of State should take a pragmatic approach to considering proposals to minimise negative impacts.”	Commitments adopted as part of the MHPGC Project include a CSIP which identifies burial and protection options, based on seabed conditions to uphold navigational safety, as detailed in Section 8.7. Therefore, less strategically important routes are not anticipated to be disrupted in the long-term and no such impact has subsequently been scoped in.
Section 2.8.288: “The Secretary of State should be satisfied that risk to navigational safety is ALARP. It is government policy that wind farms and all types of offshore transmission should not be consented where they would pose unacceptable risks to navigational safety after mitigation measures have been adopted.”	The impact assessment has applied the FSA process to determine an ALARP status for each impact and all have been deemed to be ALARP and not significant in EIA terms. The impact assessment methodology is provided in Section 8.5.
Section 2.8.299: “The Secretary of State should be satisfied that the scheme has been designed to minimise the effects on recreational craft and that appropriate mitigation measures, such as buffer areas, are built into applications to allow for recreational use outside of commercial shipping routes.”	Recreational vessels have been characterised as part of the baseline in Section 8.4 and subsequently considered throughout the impact assessment presented in Section 8.8.
NPS EN-5	
Section 2.13.23: “Onshore connection locations for offshore transmission must seek to minimise environmental and other impacts, both onshore and in the marine environment and including to local communities.”	Impacts on shipping and navigation receptors in proximity to landfall are considered within the impact assessments presented in Section 8.8. Further detail on the selection of connection locations is contained in Volume 1, Chapter 3: Site Selection & Consideration of Alternatives, of the PEIR.

National Planning Policy Framework

- 8.2.3.2 Due to the nature of shipping and navigation, no policies have been considered relevant to this chapter and therefore the National Planning Policy Framework (NPPF) has not been considered here.

8.2.4 Marine planning policy context

8.2.4.1 The following marine plans are relevant to shipping and navigation and have informed the preliminary assessment of effects in this chapter, their relevance to the MHPGC Project is outlined in **Table 8.2**:

- The UK Marine Policy Statement (MPS) (His Majesty's (HM) Government, 2011a);
- Scotland's National Marine Plan (Scottish Government, 2015);
- Northeast Inshore and Northeast Offshore Marine Plan (HM Government, 2021).

Table 8.2: Marine planning policy relevant to shipping and navigation

Marine plan description	How and where considered in the PEIR
UK Marine Policy Statement	
Section 3.4.7: "Increased competition for marine resources may affect the sea space available for the safe navigation of ships. Marine plan authorities and decision makers should take into account and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety and ensure that their decisions are in compliance with international maritime law."	The movements of vessels have been considered throughout the impact assessment presented in Section 8.8 , including in relation to available sea room in the presence of the MHPGC Project and associated vessels undertaking activity.
Scotland's National Marine Plan	
Section 13, Transport 1: "Navigational safety in relevant areas used by shipping now and in the future will be protected, adhering to the rights of innocent passage and freedom of navigation contained in UNCLOS. The following factors will be taken into account when reaching decisions regarding development and use: The extent to which the locational decision interferes with existing or planned routes used by shipping, access to ports and harbours and navigational safety. This includes commercial anchorages and defined approaches to ports. Where interference is likely, whether reasonable alternatives can be identified. Where there are no reasonable alternatives, whether mitigation through measures adopted in accordance with the principles and procedures established by the International Maritime Organization can be achieved at no significant cost to the shipping or ports sector."	Impacts to navigational safety, local ports, vessel routeing including commercial ferries and displacement have been considered in the impact assessment presented in Section 8.8 . Additionally, commitments accounted for in the impact assessment are presented in Section 8.7 .
Section 13, Transport 2: "Marine development and use should not be permitted where it will restrict access to, or future expansion of, major commercial ports or existing or proposed ports and harbours."	
Section 13, Transport 3: "Ferry routes and maritime transport to island and remote mainland areas provide essential connections and should be safeguarded from inappropriate marine development and use that would significantly interfere with their operation. Developments will not be consented where they will unacceptably interfere with lifeline ferry services."	

Marine plan description	How and where considered in the PEIR
Section 13, Transport 6: “Marine planners and decision makers and developers should ensure displacement of shipping is avoided where possible to mitigate against potential increased journey lengths (and associated fuel costs, emissions and impact on journey frequency) and potential impacts on other users and ecologically sensitive areas.”	
Northeast Inshore and Northeast Offshore Marine Plan	
NE-CAB-1: “Preference should be given to proposals for cable installation where the method of protection is burial. Where burial is not achievable, decisions should take account of protection measures for the cable that may be proposed by the applicant. Where burial or protection measures are not appropriate, proposals should state the case for proceeding without those measures.”	Burial will be the primary means of cable protection, and any alternative approaches (i.e. external protection) will be implemented and monitored in line with the findings of the Cable Burial Risk Assessment (CBRA) (see Volume 2, Annex 8.2: Cable Burial Risk Assessment, of the PEIR). This is captured as a commitment in Section 8.7.
NE-PS-3: Proposals that require static sea surface infrastructure or that significantly reduce under keel clearance which encroaches upon high density navigation routes, strategically important navigation routes, or that pose a risk to the viability of passenger services, must not be authorised unless there are exceptional circumstances.”	The reduction in under keel clearance due to external protection is considered in the impact assessment in Section 8.8.
NE-CAB-2: “Proposals which may have adverse cumulative effects with other existing, authorised, or reasonably foreseeable proposals must demonstrate that they will, in order of preference: a) avoid b) minimise c) mitigate adverse cumulative and/or in-combination effects so they are no longer significant.”	The impact assessment and cumulative impact assessment undertaken in Section 8.8 and Section 8.9, respectively, give due consideration to existing and future developments including other transmission projects and offshore wind farms.
NE-CBC-1: “Proposals must consider cross-border impacts throughout the lifetime of the proposed activity. Proposals that impact upon one or more marine plan areas or terrestrial environments must show evidence of the relevant public authorities (including other countries) being consulted and responses considered.”	Since the MHPGC Project is located across Scottish and English waters, the impact assessment undertaken in Section 8.8 considers the significance of effect for both territories. Consultation has been undertaken with stakeholders relevant to both Scottish and English waters such as the NLB and Trinity House as the respective GLAs. Transboundary impacts are discussed in Section 8.11. The Automatic Identification System (AIS) data which forms the baseline data covers international shipping, including Denmark, the Netherlands, Norway and Iceland, as identified in the transboundary screening exercise in Volume 1, Annex 4.2: Transboundary Screening, of the PEIR. It is therefore considered that the assessment in Section 8.11 also considers transboundary impacts.

8.2.5 Local policy context

- 8.2.5.1 The terrestrial infrastructure associated with the MHPGC Project is located within the jurisdiction of Durham County Council. There is no local planning policy considered relevant to shipping and navigation.

8.3 Consultation and engagement

8.3.1 Scoping

- 8.3.1.1 A Scoping Report for the MHPGC Project was issued to the PINS and MD-LOT in February 2025 (RPS, 2025). Following consultation with the appropriate statutory bodies, PINS (on behalf of the SoS) and MD-LOT both provided Scoping Opinions in March 2025 (PINS, 2025; MD-LOT, 2025, respectively).
- 8.3.1.2 **Table 8.3** sets out the key comments raised during the scoping process specific to shipping and navigation, with details of how these comments have been addressed within the PEIR.

Table 8.3: Summary of scoping responses relevant to shipping and navigation

Comment	How and where considered in the PEIR
Planning Inspectorate	
(Scoping Opinion ID 3.9.1) Agree with the MHPGC Project Scoping Report that there will be minimal project vessel traffic during operation so reduced access to local ports can be scoped out of further assessment.	This is scoped in and assessed for the construction and decommissioning phase only, as noted in the overview of impacts provided in Section 8.6 , and has been scoped out for the O&M phase.
(Scoping Opinion ID 3.9.2) Agree with the MHPGC Project Scoping Report that there will be minimal project vessel traffic during operation so disruption to fishing and recreational activities can be scoped out of further assessment.	This is scoped in and assessed for the construction and decommissioning phase only, as noted in the overview of impacts provided in Section 8.6 , and has been scoped out for the O&M phase. Disruption to fishing and recreational activities is assessed fully in Volume 2, Chapter 7: Commercial Fisheries, of the PEIR and Volume 2, Chapter 10: Infrastructure and Other Sea Users, of the PEIR .
(Scoping Opinion ID 3.9.3) Disruption to third-party marine activities e.g., dredging during operation, should not be scoped out of the assessment as the cable location has not yet been finalised.	Disruption to third-party marine activities such as dredging is assessed for all phases of the MHPGC Project, including the O&M phase as noted in the overview of impacts provided in Section 8.6 .
(Scoping Opinion ID 3.9.4) Reduction in under-keel clearance as a result of subsea infrastructure (construction and decommissioning) should not be scoped out of the assessment as the presence of infrastructure during ongoing construction works, and before being removed entirely (if removal is sought) during decommissioning could result in reduced under-keel clearance.	Reduction in under-keel clearance is assessed for all phases of the MHPGC Project, including the construction and decommissioning phases as noted in the overview of impacts provided in Section 8.6 .
(Scoping Opinion ID 3.9.5) During ongoing construction works and prior to being removed entirely during decommissioning (if removal is sought), the presence of infrastructure could result in anchor interaction so this should not be scoped out of the assessment.	Anchor and fishing gear interaction is assessed for all phases of the MHPGC Project, including the construction and decommissioning phases as noted in the overview of impacts provided in Section 8.6 .
(Scoping Opinion ID 3.9.6) Agree with the MHPGC Project Scoping Report that fishing gear interactions with subsea cables can be scoped out of the assessment from a navigational safety perspective for the construction and decommissioning phases, provided that the proposed mitigations are adhered to and a NRA is provided as part of the DCO application.	Fishing gear interactions with subsea cables has been assessed for all phases, given that as per Scoping Opinion ID 3.9.5 anchor interaction was required to be assessed for all phases, as noted in the overview of impacts provided in Section 8.6 .

Comment	How and where considered in the PEIR
(Scoping Opinion ID 3.9.7) Agree with the MHPGC Project Scoping Report that there is sufficient mitigation in place to scope out interference with navigation, communication and position fixing equipment from further assessment for the construction and decommissioning phases.	Interference with navigation, communication and position-fixing equipment is scoped in for the O&M phase, as noted in the overview of impacts provided in Section 8.6. The impact is also scoped in for the construction phase to consider the period when the offshore export cables are energised during testing.
MD-LOT	
(Scoping Opinion ID 5.10.1) Agree with the study area identified in the MHPGC Project Scoping Report.	Noted, and a 5 nautical mile (nm) buffer around the offshore extents of the MHPGC Project PEIR Red Line Boundary has been adopted for the Shipping and Navigation Study Area accordingly.
(Scoping Opinion ID 5.10) The Scottish Ministers referred to the MCA representations on the completion of an NRA, compass deviation, burial and protection and the general NRA approach.	The MCA representation is considered in the entries below.
MCA	
Attention should be paid to vessel routing including commercial shipping routes. The likely cumulative and in combination effects on shipping routes should be considered for this project. It should consider the proximity to other wind farm developments, other infrastructure, and the impact on safe navigable sea room.	An assessment of cumulative impacts is presented in Section 8.9. Main commercial routes are identified in the baseline analysis in Section 8.4, including those of commercial ferries. In combination, or inter-related effects are assessed in Section 8.12.
A completed Marine Guidance Note (MGN) checklist should be completed as part of the NRA.	A completed MGN 654 checklist is presented in Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR.
As the scope of this report concerns mainly cable laying areas and no fixed structures are planned, then AIS only data is acceptable on this occasion.	This chapter analyses 12 months of AIS data in Section 8.4 to ensure that any seasonal variations in vessel traffic are sufficiently accounted for.
The MCA draw attention to cable protection and burial, specifically noting requirements on protection height above the seabed. The MCA would be willing to accept a 5% reduction in water depth referenced to Chart Datum (CD).	Under keel clearance is assessed in Section 8.8, with a particular focus given to shallow waters. If water depth reduction exceeds 5% in any area, further detailed assessment and consultation with the MCA and GLA (NLB in Scottish waters and Trinity House in English waters) will be required (CoT52) and this is acknowledged in the commitments in Section 8.7.
As no fixed structures are planned for the MHPGC Project a Search and Rescue (SAR) checklist and full Emergency Response Co-operation Plan (ERCoP) are not required. A Marine Emergency Action Card (MEAC) is considered appropriate for this part of the project when considered in isolation.	A MEAC will be prepared post-consent as secured via the Offshore Environmental Management Plan (OEMP) (CoT06) as outlined in Section 8.7.
The MCA would be willing to accept a three-degree deviation for 95% of the cable route. For the remaining 5% of the cable route no more than five degrees will be attained. If a High Voltage Direct Current (HVDC) cable is being used, we would expect the applicant to do a desk based compass deviation study based on the specifications of the cable lay proposed and assess the effect of electromagnetic fields (EMF) on ship's compasses. MCA may request for a deviation survey post the cable being laid; this will confirm conformity with the consent condition. The developer should then provide this data to United Kingdom Hydrographic Office (UKHO) via a hydrographic note (H102).	Compass deviation effects have been assessed in Volume 2, Annex 8.3: Marine EMF Compass and Deviation Report, of the PEIR featuring a number of design scenarios. It is noted that some design cases may exceed the limits outlined by the MCA. For such misalignment, an updated desk based compass deviation study will be undertaken prior to construction on the final cable specifications, and consultation undertaken with the MCA (CoT53).. Interference with navigational equipment is considered within the risk assessment presented in Section 8.8.

8.3.2 Further consultation and engagement

8.3.2.1 Further consultation with key stakeholders has been undertaken via a virtual meeting, held on 21 November 2025, and email correspondence. Additional consultation has been summarised in **Table 8.4**.

Table 8.4: Summary of further consultation and engagement

Date	Consultee and response type	Comment	How and where considered in the PEIR
05 November 2025	DFDS Seaways, Email correspondence	DFDS Seaways were invited to provide feedback on the overlap between their routes and the MHPGC Project PEIR Red Line Boundary and raised no concerns.	Interaction with passenger routes is considered within the assessment presented in Section 8.8 .
21 November 2025	Port of Seaham, Virtual meeting	It was indicated that there was a notable fishing fleet operating out of Sunderland which may not be fully represented on AIS.	In addition to AIS data, Vessel Monitoring System (VMS) data has been considered as an additional data source to cover fishing activity (see Section 9 of Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR). The use of additional data sources such as VMS was presented during consultation meeting held on 21 November, with no stakeholders raising a concern over the data sources. Disruption to fishing activities is considered within the assessment presented in Section 8.8 . Assessment of commercial matters relating to fishing is presented in Volume 2, Chapter 7: Commercial Fisheries, of the PEIR .
		Anchor dragging has been noted off Seaham but is not common. The main anchorage area off Seaham is located 1nm northeast of the Seaham Lighthouse, however this can move further north or south depending on conditions.	Anchoring activity within the Shipping and Navigation Study Area is presented in Section 8.4 and is consistent with the feedback given by the Port of Seaham. Anchor interaction is assessed in Section 8.8 .
		It was indicated that although recreational vessels are under-represented on AIS, the data appeared as expected and was representative of typical activity.	Disruption to recreational vessel activity is considered within the assessment presented in Section 8.8 , noting that recreational activities are under-represented.

Date	Consultee and response type	Comment	How and where considered in the PEIR
		It was recommended that Sail Training International are contacted regarding future editions of the Tall Ships Race to establish any potential overlap between future race routes and the MHPGC Project PEIR Red Line Boundary.	Sail Training International have not been contacted at this stage, as information will be of greater value closer to the construction phase commencing. Section 8.7 presents commitments, including promulgation of information (CoT04). This commitment includes target information being provided to fishing and recreational bodies, such as Sail Training International.
27 November 2025	Port of Sunderland, Email correspondence	The location of the MHPGC Project PEIR Red Line Boundary is not expected to cause any issues for the Port of Sunderland, provided adequate navigation warnings are in place.	Reduction in port access is considered within the assessment presented in Section 8.8 , with navigation warnings included as commitments as noted in Section 8.7 .
04 December 2025	MCA, Email correspondence	The MCA were content for targeted consultation meetings in place of a hazard workshop, provided a hazard log is included as part of the NRA.	A hazard log has been prepared, and is included in Appendix A of Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR .

8.4 Baseline characterisation

8.4.1 Overview

- 8.4.1.1 **Volume 1, Chapter 2: Project Description, of the PEIR** sets out the description of the MHPGC Project and **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** sets out the overarching approach that has been used in developing the preliminary environmental information.
- 8.4.1.2 This section describes the methods and data sources used to characterise the baseline for shipping and navigation within the study area and describes the existing baseline characteristics.

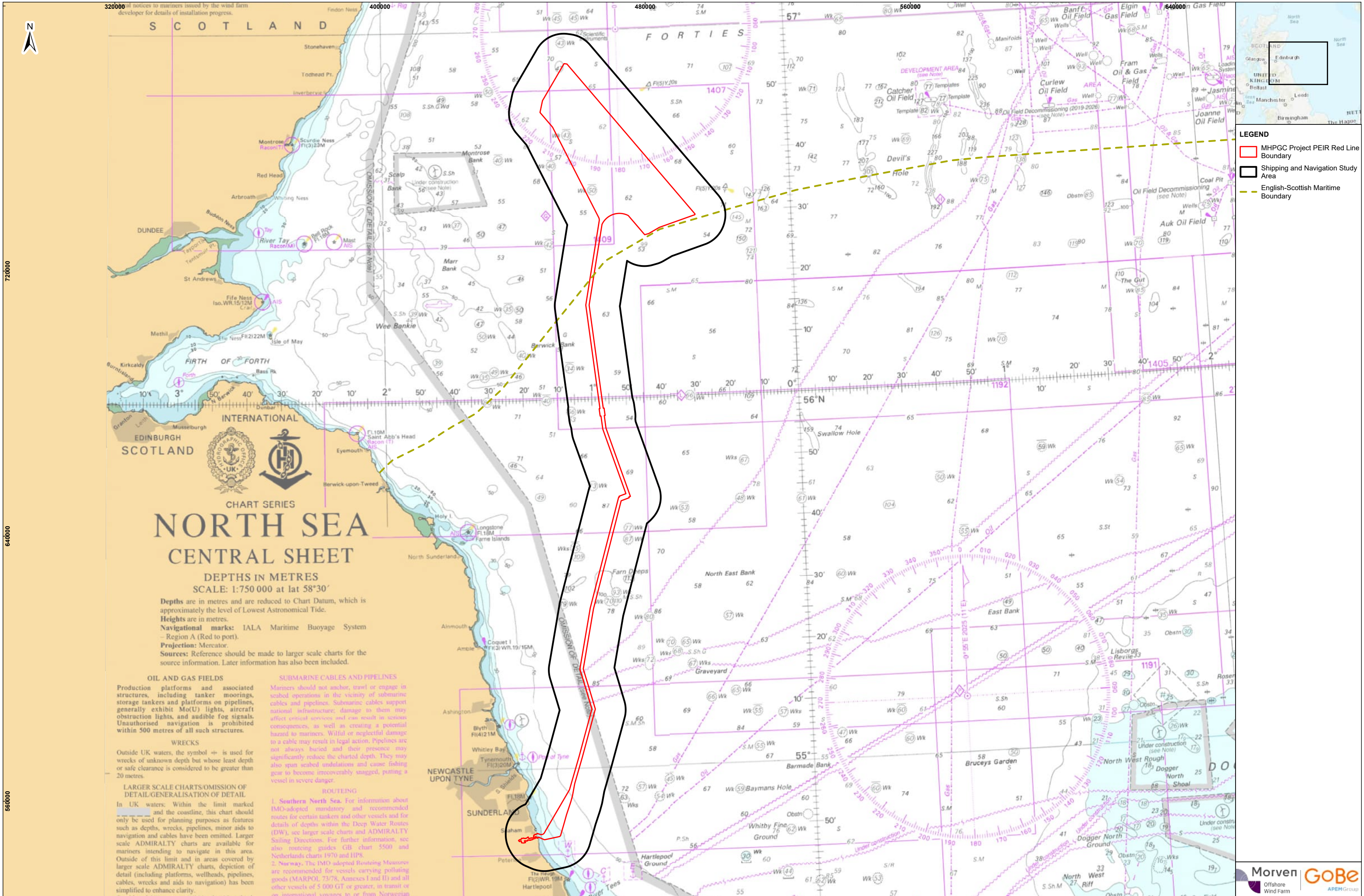
8.4.2 Shipping and Navigation Study Area

- 8.4.2.1 A Shipping and Navigation Study Area has been defined comprising a 5nm buffer around the MHPGC Project PEIR Red Line Boundary seaward of MHWS. This is sufficient to encompass relevant shipping and navigational features which may influence routeing in proximity to the MHPGC Project. Where relevant, features such as ports and harbours outside of the Shipping and Navigation Study Area have also been considered. MD-LOT agreed with the proposed Shipping and Navigation Study Area in its scoping response [see **Section 8.3**]. PINS did not comment on the proposed study area in its scoping response.
- 8.4.2.2 The Shipping and Navigation Study Area is shown on **Figure 8.1**.

8.4.3 Relevant guidance

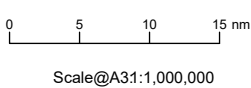
- 8.4.3.1 The assessment has been carried out in accordance with the following guidance documents:
- MGN 654:
 - MGN 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREI) – Guidance on UK Navigational Practice, Safety and Emergency

- Response (MCA, 2021a) highlights issues that need to be taken into consideration when assessing the impact on navigational safety and emergency response caused by OREIs;
- This includes matters relating to subsea cables and in particular approach to cable burial and protection. MGN 654 is considered where relevant throughout this PEIR chapter with compliance included as a commitment in **Section 8.7**;
 - To appropriately characterise the baseline for shipping and navigation, data collection has followed the principles of, and is compliant with, MGN 654 (MCA, 2021). This includes use of the MGN 654 Checklist which indicates relevant baseline elements which should be considered including vessel types and navigational features.
- Revised Guidelines for Formal Safety Assessment for Use in the International Maritime Organization Rule-Making Process:
 - The Revised Guidelines for Formal Safety Assessment (FSA) for Use in the IMO Rule-Making Process (IMO, 2018) provides a five-step systematic methodology for undertaking risk assessment in the marine environment based on risk analysis and cost benefit analysis (if applicable);
 - This has been used as the basis for the impact assessment methodology for shipping and navigation, with the detailed methodology provided in **Section 8.5**.
 - MGN 661:
 - MGN 661 (Merchant and Fishing) Navigation – Safe and Responsible Anchoring and Fishing Practices (MCA, 2021b) provides information to mariners when undertaking anchor operations and fishing activities in the vicinity of subsea cables and pipelines;
 - MGN 661 has been considered in full throughout this PEIR chapter.
 - The RYA's position on offshore renewable energy developments. Paper 1 (of 4) – Wind Energy June 2019:
 - The RYA's position on offshore renewable energy developments. Paper 1 (of 4) – Wind Energy June 2019 (RYA, 2019) notes that the vessels may anchor in an emergency to avoid drifting into allision scenarios, which may lead to an anchor being dropped over a subsea cable. The paper also notes the potential for reduced under keel clearance associated with rock protection on cables. Both of these impacts are assessed in **Section 8.8**.
 - The Fisheries Liaison with Offshore Wind and Renewables (FLOWW) Best Practice Guidance for Fisheries Liaison with Offshore Renewables Developments (FLOWW, 2025):
 - The document provides guidance to renewable energy developers on how to liaise with the fishing industry, including highlighting the importance of timely notifications.



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 8.1: MHPGC PROJECT PEIR RED LINE BOUNDARY SHIPPING AND
NAVIGATION STUDY AREA



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey, UKHO

Service Layer Credits:
21828-0 (750000):
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA
© Crown Copyright and/or database rights. Reproduced by permission of The Keeper of Public
Records and the UK Hydrographic Office (<https://copyright.ukho.gov.uk>).

Drawing Number:
M3-MV-ANA-0801

VER	DATE	DETAILS	BY	CHECK
00	28/07/2025	Initial Issue	DS	LD
-	-	-	-	-

8.4.4 Baseline data sources

Desk study

- 8.4.4.1 Information on shipping and navigation within the Shipping and Navigation Study Area was collected through a detailed desktop review of existing studies and datasets. These are summarised in **Table 8.5** below. No site-specific surveys have been undertaken for shipping and navigation.

Table 8.5: Summary of key desktop reports used to characterise the shipping and navigation baseline

Data source	Period/publication	Coverage
TCE Marine Aggregate Dredging Areas	2025	UK waters
TCE and The Crown Estate Scotland (TCES) Offshore Wind Farm Boundaries	2025	UK waters
Centre for Environment Fisheries and Aquaculture Science (Cefas) - UK Disposal Site Layer	2023	UK waters
Department for Transport (DfT) port arrival statistics	8 years, 2017 to 2024	UK ports
UKHO Sailing Directions: North Sea (West) NP54	2021	UK east coast
AIS data	12 months, October 2024 to September 2025	Full Shipping and Navigation Study Area
AIS, Radar and Visual Observation Data recorded via vessel-based surveys	26 November 2024 to 06 December 2024 20 June 2024 to 04 July 2024	Morven North and Morven South
Royal National Lifeboat Institution (RNLI) incident data	10 years, 2016 to 2025	Full Shipping and Navigation Study Area
Marine Accident Investigation Branch (MAIB) incident data	10 years, 2016 to 2025	Full Shipping and Navigation Study Area
DfT SAR Helicopter Taskings data	10 years, April 2015 to March 2025	Full Shipping and Navigation Study Area
UKHO Admiralty Charts (1191, 1192, 1407, 1409 and 273)	Latest available	Full Shipping and Navigation Study Area
MD-LOT VMS satellite fishing data (Scotland only)	12 months, 2025	Scottish waters
MMO VMS satellite fishing data	12 months, 2020	Primarily English waters

Data limitations and assumptions

- 8.4.4.2 UKHO Admiralty Charts and Sailing Directions are updated periodically, and therefore the information shown may not reflect real-time features with complete accuracy. However, the Admiralty Charts are considered to be suitably up-to-date for the purposes of informing the baseline characterisation with the Sailing Directions used as a useful resource to supplement the Admiralty Charts. Where possible, any information not yet updated on the Admiralty Charts has been sought through consultation with shipping and navigation stakeholders to minimise any limitations in the baseline characterisation.
- 8.4.4.3 For wrecks, only those deemed to be of navigational significance are charted. Non-charted wrecks are considered in **Volume 2, Chapter 9: Marine Archaeology, of the PEIR**.

- 8.4.4.4 The vessel traffic data may not be comprehensive of all vessels since AIS carriage is not mandatory for all vessel types. In particular, AIS equipment is required to be fitted on all vessels of greater than 300 gross tonnes (GT) engaged on international voyages, cargo vessels of more than 500GT not engaged on international voyages, passenger vessels irrespective of size built on or after 01 July 2002 and fishing vessels over 15m length. A proportion of smaller vessels may carry AIS voluntarily, typically utilising a Class B AIS device. Additional sources such as VMS data and consultation with shipping and navigation stakeholders ensures the baseline characterisation of vessel traffic is as comprehensive as possible.
- 8.4.4.5 It is assumed that vessels under an obligation to broadcast information via AIS (as outlined above) have done so. It is also assumed that the details broadcast via AIS are accurate unless clear evidence to the contrary was identified.
- 8.4.4.6 Temporary vessel traffic has been identified and excluded from the baseline characterisation as non-representative. This accounted for 9% of all vessel tracks recorded across the data period with further details provided in **Section 9.1 of Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR**.
- 8.4.4.7 For MAIB incident data, all UK commercial vessels are required to report incidents to the MAIB, but non-UK vessels do not have to report unless they are in a UK port or within UK 12nm territorial waters and carrying passengers to a UK port. There are no requirements for non-commercial recreational craft to report accidents to the MAIB. Likewise, for RNLI incident data, any incident to which an RNLI resource has not been mobilised has not been accounted for. False alarms and hoaxes are recorded as part of this dataset but have been excluded from the baseline characterisation.

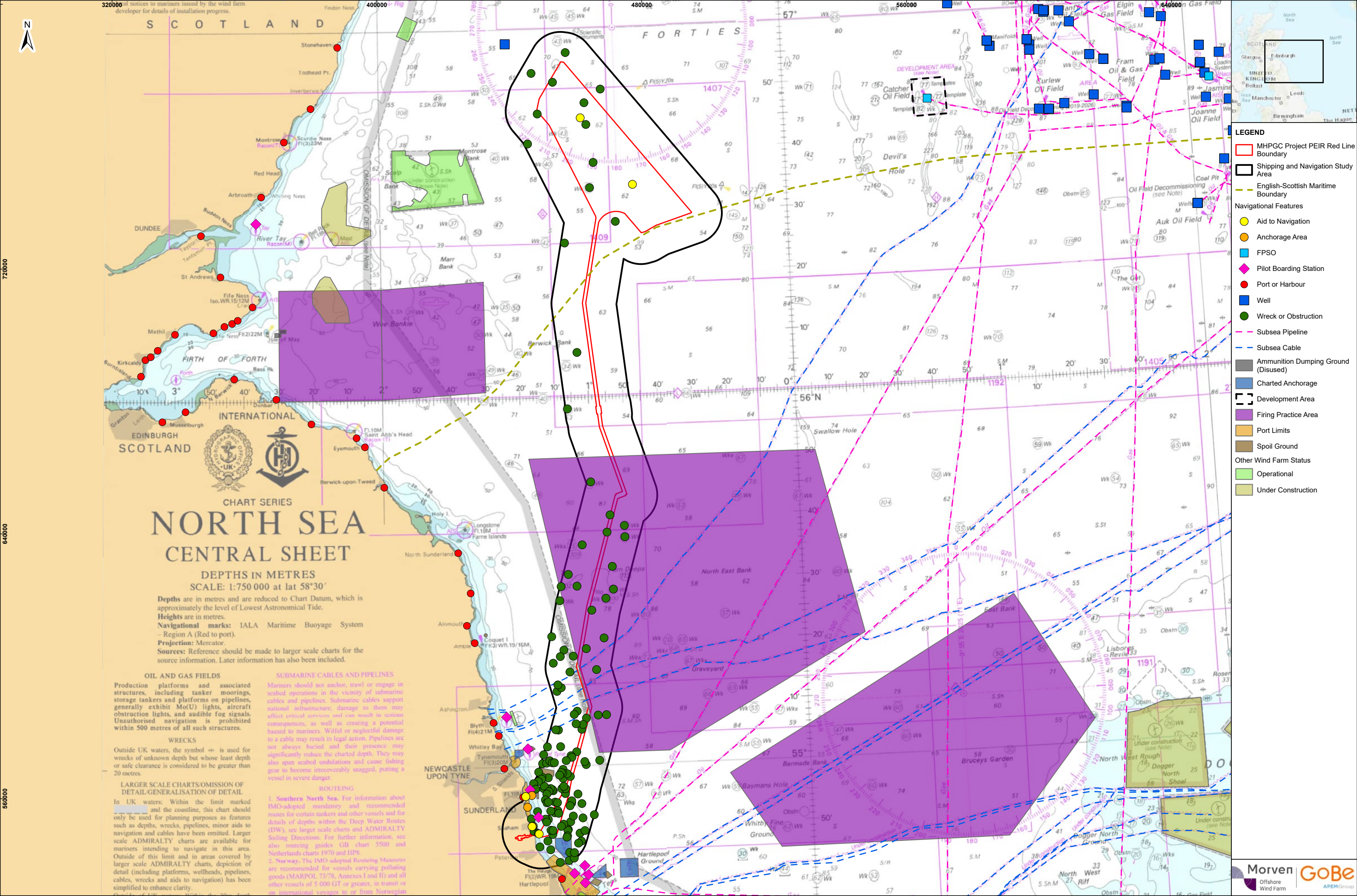
8.4.5 Overview of baseline environment

Navigational features

- 8.4.5.1 The navigational features within and relevant to the MHPGC Project PEIR Red Line Boundary are shown on **Figure 8.2** with key navigational features discussed below. Key navigational features have been identified as those directly relevant to the Assessment of Impacts presented in **Section 8.8**, such as ports, harbours and anchorages and the locations of cable crossings. It is noted that all navigational features discussed here are within English waters, as these were most pertinent to the assessment. Further details on navigational features, including figures at a more detailed scale and discussion of features within Scottish waters are provided in **Section 7 of Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR**.
- 8.4.5.2 The key ports and harbours of relevance are those close to landfall, including the following:
- Port of Seaham, with port limits located approximately 0.1nm north of the MHPGC Project PEIR Red Line Boundary;
 - Port of Sunderland, with limits approximately 2.5nm north of the MHPGC Project PEIR Red Line Boundary;
 - Teesport, with limits approximately 3nm southeast of the MHPGC Project PEIR Red Line Boundary.
- 8.4.5.3 The Whiskey anchorage associated with Teesport is located 0.5nm to the south of the MHPGC Project PEIR Red Line Boundary and is one of three designated anchorages associated with Teesport.
- 8.4.5.4 The UKHO Admiralty Sailing Directions advise that vessels are likely to drag anchor in Tees Bay in windspeeds above Force 8 from any direction, in windspeeds above Force 6 from north northwest through north to southeast, and if the swell exceeds 4m. In such conditions, vessels are advised not to anchor in Tees Bay.
- 8.4.5.5 Pilotage is in operation at Seaham, with the pilot boarding location 1.3nm offshore, approximately 1.0nm from the MHPGC Project PEIR Red Line Boundary. Pilotage is not compulsory at Seaham but is recommended for vessels unfamiliar with the harbour. Pilot vessels are on station during high water when vessels are expected to enter the harbour.
- 8.4.5.6 Pilotage is also in operation at Sunderland and is compulsory for vessels greater than 50m in length, vessels assisted by tugs, vessels carrying passengers or dangerous cargo, or any vessel with a

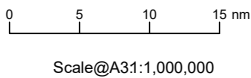
defect affecting navigation. The pilot boarding location is 4.4nm northwest of the MHPGC Project PEIR Red Line Boundary. The Sunderland Marina, located at the entrance to the Port of Sunderland also provides facilities for recreational vessels.

- 8.4.5.7 Three charted subsea cables cross the MHPGC Project PEIR Red Line Boundary, all approximately 15nm off the coast, with all three heading to landfall between Blyth and Tynemouth. Charted water depths in proximity to these crossings are generally between 60m and 90m.
- 8.4.5.8 In addition to the crossings, a disused charted cable also stops short of the MHPGC Red Line Boundary in a similar area, and a further four subsea cables are located approximately 13nm south of the MHPGC Project landfall. There is also a charted water outfall pipe within the MHPGC Project PEIR Red Line Boundary at the landfall location. Future subsea cables are considered as part of the assessment of cumulative effects in **Section 8.9**.



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 8.2: KEY NAVIGATIONAL FEATURES IN PROXIMITY TO THE MHPGC
PROJECT PEIR RED LINE BOUNDARY



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey, UKHO

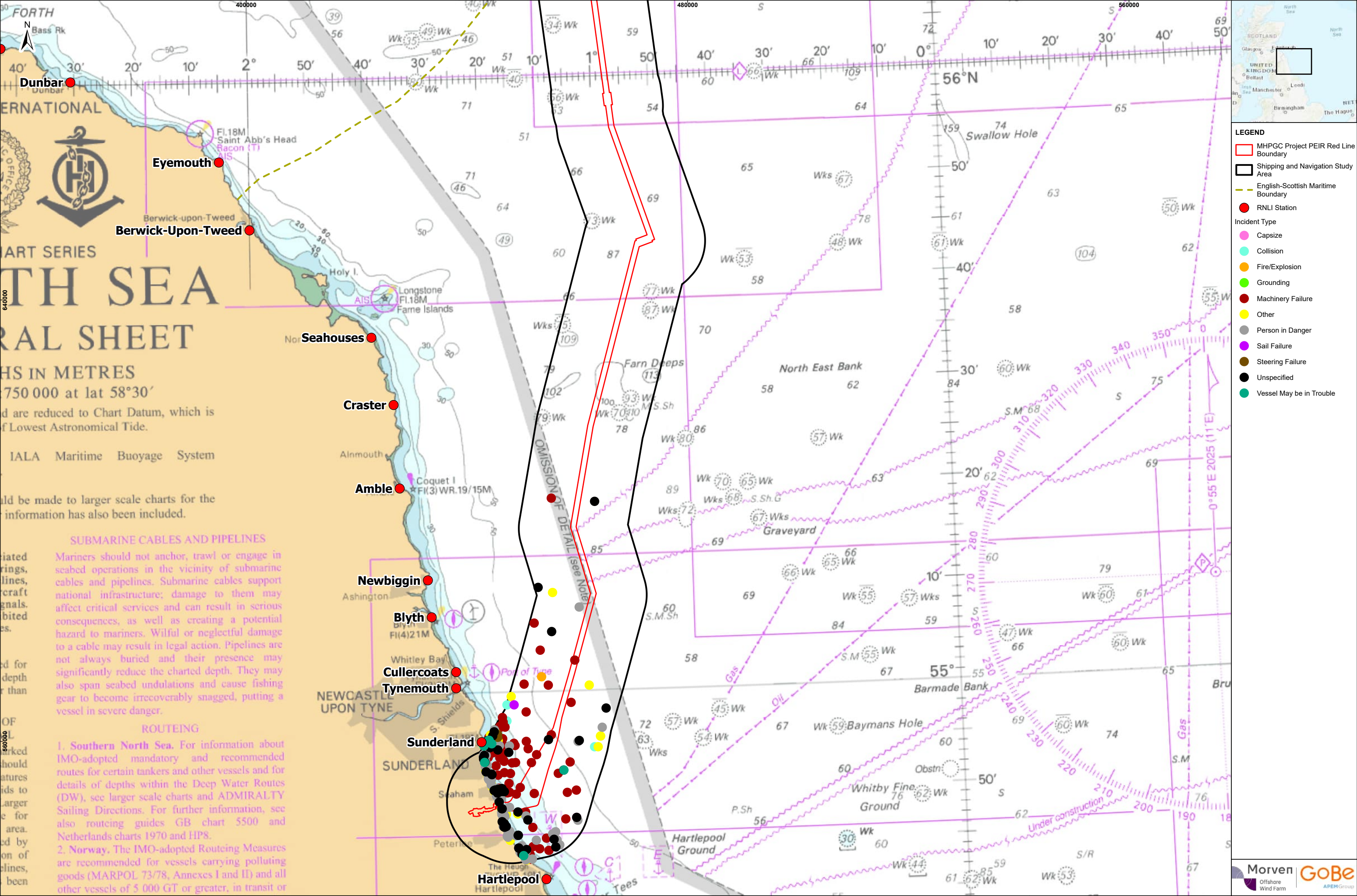
Service Layer Credits:
21828-0 (750000):
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA
© Crown Copyright and/or database rights. Reproduced by permission of The Keeper of Public
Records and the UK Hydrographic Office (<https://copyright.ukho.gov.uk>).

Drawing Number:
M3-MV-ANA-0802

VER	DATE	DETAILS	BY	CHECK
00	09/07/2025	Initial Issue	DS	LD
-	-	-	-	-

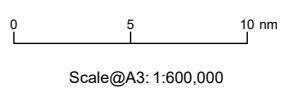
Emergency response resources and historical incident data

- 8.4.5.9 The closest RNLI stations to the MHPGC Project PEIR Red Line Boundary are those around landfall, with Sunderland RNLI station located approximately 5.8nm north of landfall and Hartlepool RNLI station located approximately 7nm south of landfall.
- 8.4.5.10 Over a 10-year period between 2016 and 2025, 321 incidents were recorded by the RNLI within the Shipping and Navigation Study Area, corresponding to an average of 32 incidents per year. Four incidents occurred within Scottish waters, with the other 317 occurring in English waters. The majority of incidents in English waters were located in nearshore areas, in proximity to landfall. The most common incident type recorded was person in danger, accounting for 36% of the incidents within the Shipping and Navigation Study Area, followed by machinery failures (30%). The most common vessel types were recreational (19%, between powered, sailing and other recreational) and fishing (13%) vessels.
- 8.4.5.11 The RNLI lifeboat stations in proximity to the MHPGC Project PEIR Red Line Boundary and RNLI reported incidents within the Shipping and Navigation Study Area are shown on **Figure 8.3**.
- 8.4.5.12 In total there were 30 incidents recorded by the MAIB over the 10-year period, corresponding to an average of three per year. One incident occurred within Scottish waters, with the other 29 occurring in English waters. Again, the majority of incidents in English waters were located in coastal areas. The most common incident types were machinery failures (43%), followed by accidents to person (20%). Fishing vessels accounted for 47% of incidents, with recreational vessels (17%), cargo vessels (17%) and tankers (13%) also involved.
- 8.4.5.13 Further details on emergency response resources and historical incident data are provided in **Section 8 of Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR**.



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 8.3: RNLI LIFEBOAT STATIONS AND INCIDENTS BY VESSEL TYPE
(2016 TO 2025)



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey, UKHO

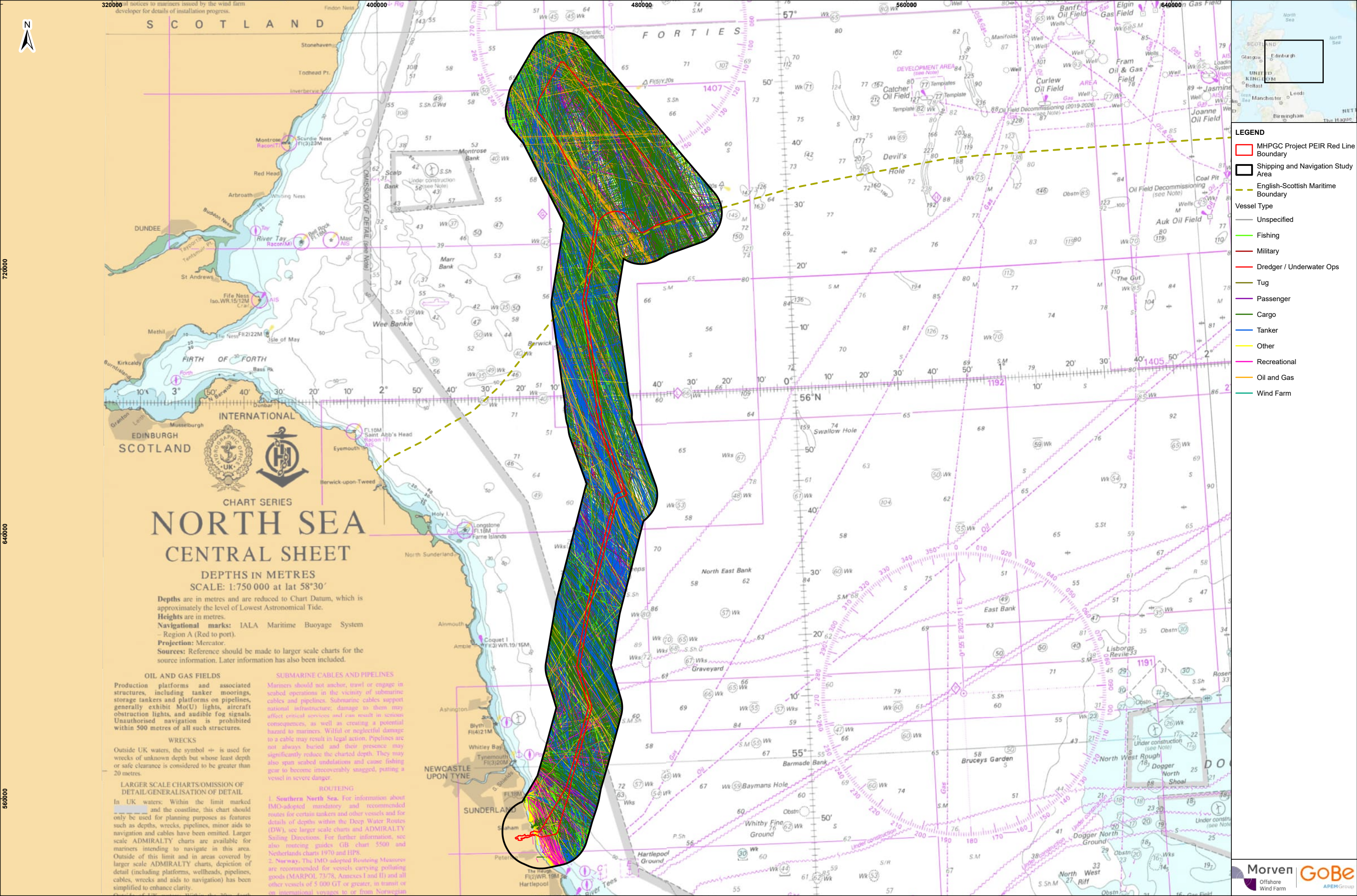
Service Layer Credits:
21828-0 (750000):
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
© Crown Copyright and/or database rights. Reproduced by permission of The Keeper of Public Records and the UK Hydrographic Office (<https://copyright.ukho.gov.uk>).

Drawing Number: M3-MV-ANA-0803				
VER	DATE	DETAILS	BY	CHECK
00	10/07/2025	Initial Issue	DS	LD
-	-	-	-	-

Vessel traffic

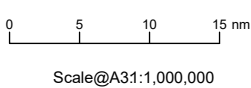
- 8.4.5.14 The vessel traffic recorded within the Shipping and Navigation Study Area over a 12-month data period from 2024 to 2025 is shown on **Figure 8.4**. Following this, the same vessel traffic converted to a density plot is shown on **Figure 8.5**.
- 8.4.5.15 There was an overall average of 45 unique vessels per day recorded within the Shipping and Navigation Study Area across the data period. The busiest month was February 2025, during which an average of 52 unique vessels per day were recorded. This was partly due to an increase in fishing vessels during this season. The quietest month was April 2025 during which an average of 39 unique vessels per day were recorded.
- 8.4.5.16 The most common vessel type recorded within the Shipping and Navigation Study Area was cargo vessels, accounting for 35% of all vessels recorded. Tankers (22%) and fishing vessels (20%) were also commonly recorded with oil and gas vessels (5%) being the only other vessel type to account for at least 5% of all vessels recorded. In Scottish waters, cargo vessels and oil and gas vessels were recorded in greater proportions with fishing vessels, recreational vessels and dredgers/underwater operations vessels recorded in considerably lower proportions. As the majority of vessels were recorded within English waters, vessel counts and vessel type distributions for English waters are broadly aligned with the Shipping and Navigation Study Area as a whole.
- 8.4.5.17 A regular Roll-On/Roll-Off (RoRo) route was recorded in the north of the Shipping and Navigation Study Area, routeing northwest southeast between Rotterdam (the Netherlands) and Tórshavn (Faroe Islands) operated by Smyril Line, crossing through both Scottish and English waters. On average, a vessel on this route intersected the Shipping and Navigation Study Area once per week. Several other RoRos were recorded across the dataset on unique occasions, however, none on scheduled routes and were likely transiting between ports for maintenance or chartering. On a similar bearing and location within the Shipping and Navigation Study Area, vessels were also recorded routeing between Glensanda (UK) and either Dyrstad (Norway) or Dutch ports, as well as between Icelandic ports and Rotterdam.
- 8.4.5.18 Tankers were primarily routeing in a northwest southeast bearing in the south of the Shipping and Navigation Study Area as well as east-west in the centre.
- 8.4.5.19 For fishing vessels likely on transit, these were transiting to and from ports and harbours on the English east coast in proximity to the south of the Shipping and Navigation Study Area, in particular the Port of Tyne. Other transiting vessels were recorded on more north-south bearings throughout the entire Shipping and Navigation Study Area with several vessels transiting to ports in the northeast of Scotland, including Fraserburgh and Macduff based on information broadcast via AIS. As for vessels likely engaged in active fishing, the greatest area of activity was at the south of the Shipping and Navigation Study Area, occurring across the width of the Shipping and Navigation Study Area, inclusive of the MHPGC Project PEIR Red Line Boundary.
- 8.4.5.20 Oil and gas vessels were more prominent in the north of the Shipping and Navigation Study Area as most vessels were routeing to and from oil and gas ports including Aberdeen and Montrose (UK) on the Scottish east coast. Defined oil and gas routeing in the north includes vessels transiting east-west between Montrose and the Belinda field and neighbouring Triton Floating Production, Storage and Offloading (FPSO) and between Montrose and the Stella and Joanne fields.
- 8.4.5.21 Two Roll-On/Roll-Off Passenger (RoPax) vessels were recorded, both operated by DFDS Seaways and routeing between Newcastle and IJmuiden (Amsterdam, the Netherlands). These vessels typically operated one transit per day on opposite routes. Cruise liners were recorded on multiple routes including between ports in the Firth of Forth and Le Havre (France) and Dutch ports, and between Newcastle and a variety of destinations in Scotland and Norway. Cruise liner activity accounted for the seasonality in passenger vessels with no cruise liners being recorded in January or February and reduced numbers recorded in the surrounding months.
- 8.4.5.22 The majority of recreational vessels were recorded closer to the coast at the south of the Shipping and Navigation Study Area within English waters, with 70% of all recreational vessels within 10nm of the coast. Such vessels were recorded transiting north-south following the coastline, while also transiting to and from Sunderland and Tees. As for those recreational vessels recorded further

offshore, transits on a northwest southeast bearing are likely transcontinental transits between other North Sea locations and northern Scotland.



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 8.4: OVERVIEW OF VESSEL TRAFFIC MOVEMENTS WITHIN SHIPPING
AND NAVIGATION STUDY AREA (12 MONTHS, 2024-25)

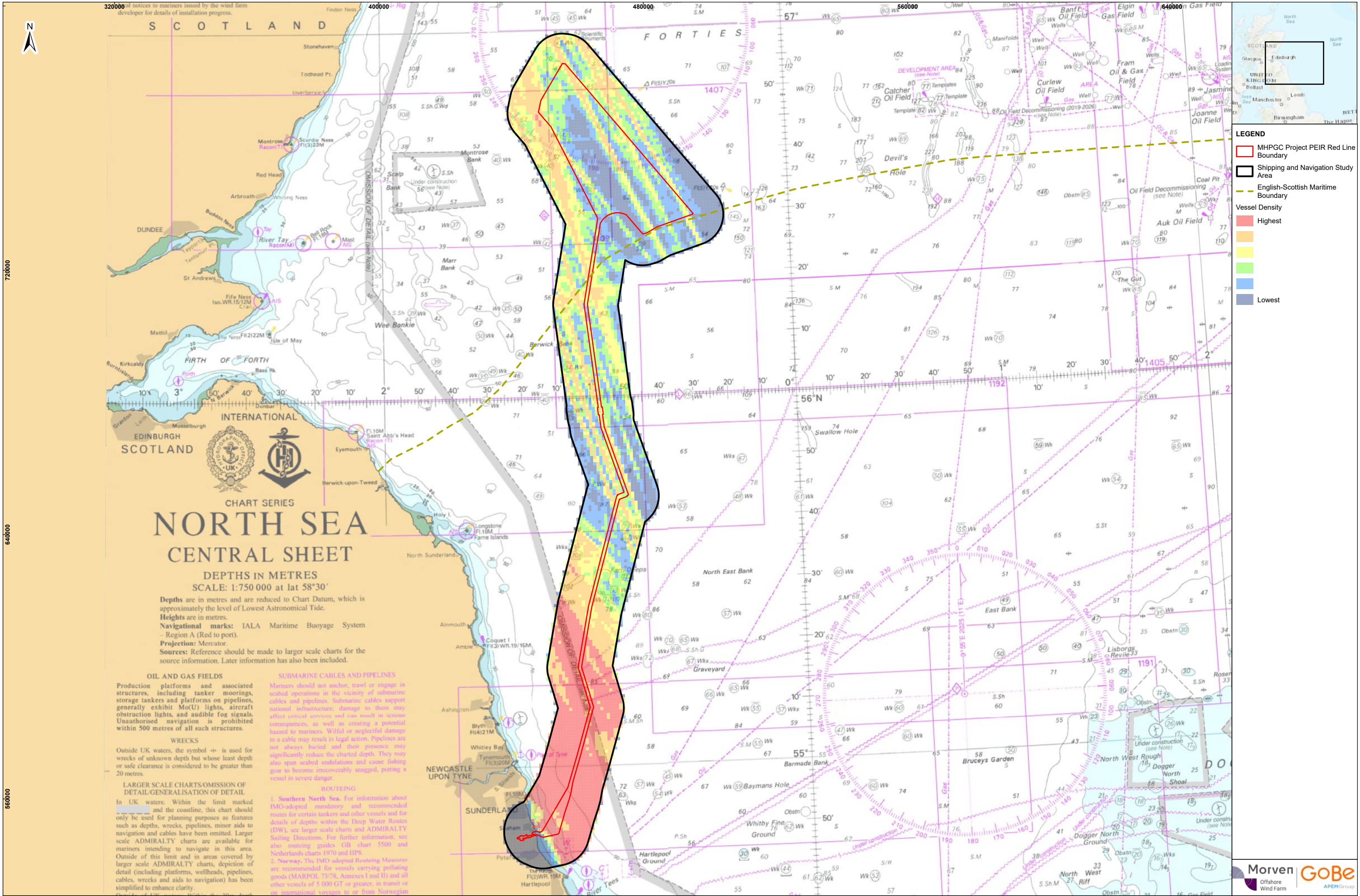


Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey, UKHO

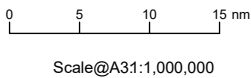
Service Layer Credits:
21828-0 (750000):
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA
© Crown Copyright and/or database rights. Reproduced by permission of The Keeper of Public
Records and the UK Hydrographic Office (<https://copyright.ukho.gov.uk>).

Drawing Number: M3-MV-ANA-0804				
VER	DATE	DETAILS	BY	CHECK
00	28/07/2025	Initial Issue	DS	LD
-	-	-	-	-



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 8.5: VESSEL DENSITY WITHIN SHIPPING AND NAVIGATION STUDY AREA
(12 MONTHS, 2024-25)



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

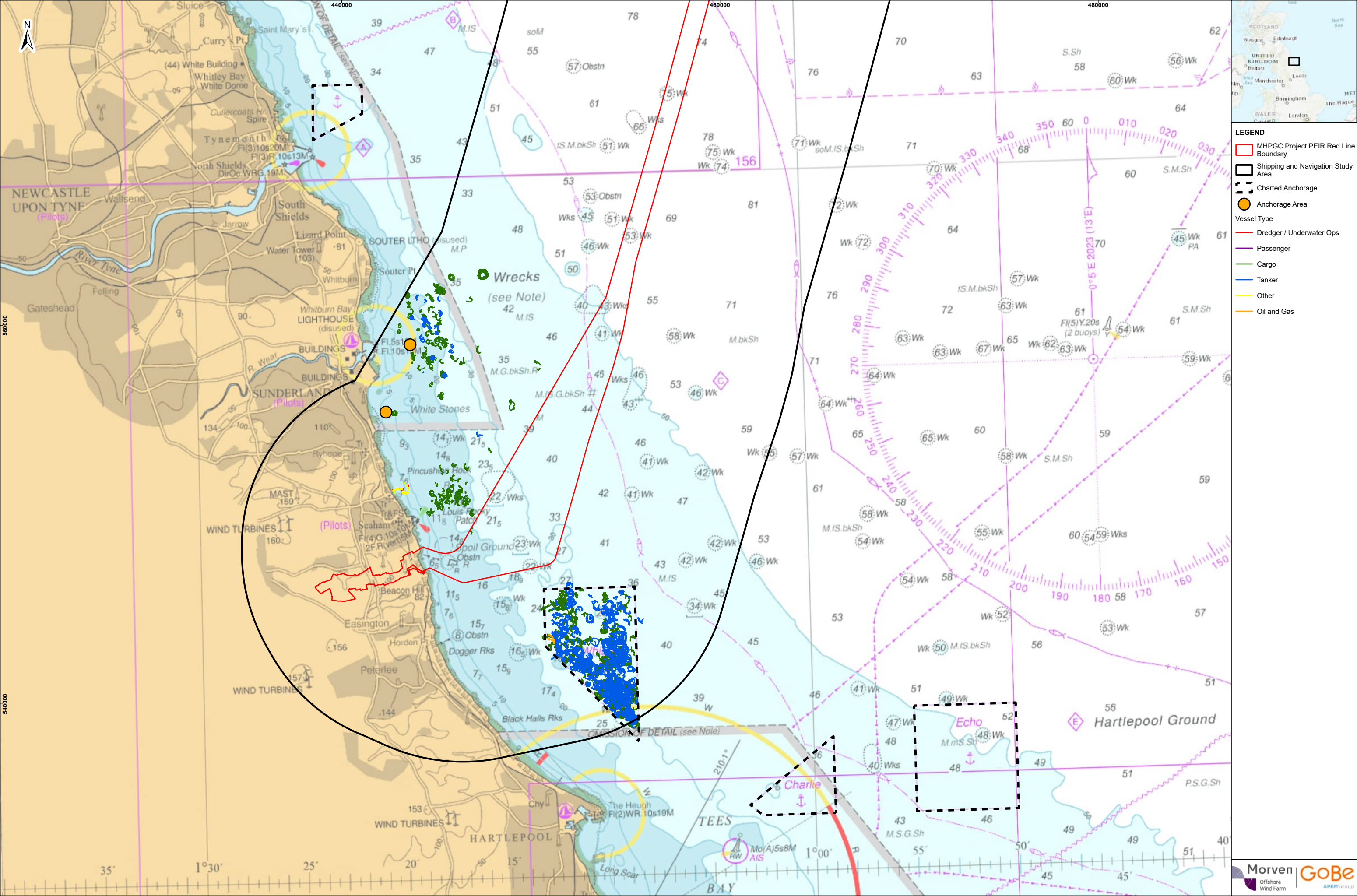
Data Sources:
BP, Ordnance Survey, UKHO

Service Layer Credits:
21828-0 (750000):
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
© Crown Copyright and/or database rights. Reproduced by permission of The Keeper of Public
Records and the UK Hydrographic Office (<https://copyright.ukho.gov.uk>).

Drawing Number:
M3-MV-ANA-0805

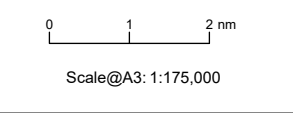
VER	DATE	DETAILS	BY	CHECK
00	28/07/2025	Initial Issue	DS	LD
-	-	-	-	-

- 8.4.5.23 The majority of wind farm vessels were recorded in the south of the Shipping and Navigation Study Area following the coastline with multiple destinations recorded via AIS including Blyth (and Blyth Offshore Demonstrator), Grimsby, Hartlepool, Lowestoft and Great Yarmouth (all UK). Crew transfer transits to Teesside were also recorded intersecting the south of the Shipping and Navigation Study Area. As for wind farm vessels transiting in the northern portion of the Shipping and Navigation Study Area, vessels were transiting to multiple locations on the Scottish east coast including Aberdeen, Peterhead, Wick and Montrose, with vessels also transiting to Seagreen and south to the English ports noted above.
- 8.4.5.24 Multiple dredging campaigns were undertaken by Sunderland Port with transits to the spoil ground approximately 1.8nm offshore. These occurred in October (2024), April, July and August (2025) and none of this activity intersected the MHPGC Project PEIR Red Line Boundary.
- 8.4.5.25 The majority of anchored vessels were within the Whiskey Anchorage to the south of the MHPGC Project PEIR Red Line Boundary. These vessels were primarily cargo and tankers with the occasional dredger/underwater operations, passenger and oil and gas vessels. Cargo vessels and tankers were recorded at anchor on the approach to Sunderland at a charted anchoring location. Cargo vessels were also recorded at anchor on approach to Seaham with information broadcast via AIS denoting these vessels were either bound for Seaham or awaiting orders and so likely waiting on berth availability. Only one vessel was deemed to be at anchor within the MHPGC Project PEIR Red Line Boundary; this vessel was an 80m length cargo vessel which was at anchor for approximately five hours on the edge of the MHPGC Project PEIR Red Line Boundary approximately 1.5nm offshore. As for information broadcast via AIS, this vessel was likely awaiting berthing availability at Seaham. The anchored vessels recorded within the Shipping and Navigation Study Area over the 12-month data period are shown on **Figure 8.6**.
- 8.4.5.26 The average length of vessels within the Shipping and Navigation Study Area was 91m. Over the study period, vessel length ranged from 4m for a rescue daughter craft to 345m for a cruise liner.
- 8.4.5.27 Excluding the proportion of vessels for which draught was not available, the average draught of vessels within the Shipping and Navigation Study Area was 5.6m. Over the study period, vessel draught ranged from 0.2m for a fishing vessel to 20.6m for a crude oil tanker.
- 8.4.5.28 Further details on vessel traffic movements are provided in **Section 9 of Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR**.



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 8.6: ANCHORED VESSELS WITHIN SHIPPING AND NAVIGATION STUDY
AREA (12 MONTHS, 2024-25)



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey, UKHO

Service Layer Credits:
1191-0 (200000):
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
© Crown Copyright and/or database rights. Reproduced by permission of The Keeper of Public
Records and the UK Hydrographic Office (<https://copyright.ukho.gov.uk>).

Drawing Number: M3-MV-ANA-0806				
VER	DATE	DETAILS	BY	CHECK
00	28/07/2025	Initial Issue	DS	LD
-	-	-	-	-

8.4.6 Future baseline conditions

- 8.4.6.1 During the 35 year operational lifetime of the MHPGC Project, the shipping and navigation baseline can be expected to evolve both on a natural basis and in response to global trends such as climate change and other anthropogenic activities. The Infrastructure Planning (EIA) Regulations 2017, the Marine Works (Environmental Impact Assessment) Regulations 2007 and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 require that "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" is included. Therefore, an assessment of future baseline conditions, in the absence of the MHPGC Project, has been undertaken and is described within this section.

Offshore wind farms

- 8.4.6.2 There are various planned offshore wind farms that may become operational during the operational lifetime of the MHPGC Project. In Scottish waters, this includes the consented Berwick Bank which may lead to changes to vessel traffic patterns in the future as vessels re-route around the Berwick Bank array. Scoped developments also include Morven North, Morven South and Ossian and, given their location relative to the MHPGC Project PEIR Red Line Boundary, vessels associated with these may pass through the Shipping and Navigation Study Area, increasing vessel numbers. Third-party vessels may also be deviated closer to the MHPGC Project PEIR Red Line Boundary as part of re-routing to avoid the arrays.
- 8.4.6.3 In English waters no offshore wind farms are likely to have a material influence of future traffic patterns in proximity to the MHPGC Project PEIR Red Line Boundary. Projects and plans considered in the assessment of cumulative effects, including planned offshore wind farms, are presented in **Section 8.9**.

Oil and gas developments and decommissioning

- 8.4.6.4 Given the limited oil and gas infrastructure located in proximity to the MHPGC Project PEIR Red Line Boundary, oil and gas decommissioning work is not expected to increase traffic greatly within the Shipping and Navigation Study Area. However, changes to oil and gas infrastructure within the wider North Sea may alter the routing of oil and gas vessels visiting installations, leading to crossing locations changing in the future, across both Scottish and English waters.

Port trends and developments

- 8.4.6.5 Based on the AIS data, the most common vessel destinations broadcast in Scottish waters included Forth Ports and Aberdeen. From DfT data, arrivals at Forth Ports have been mostly steady in recent years, while Aberdeen has seen an 18% increase over the past eight years. This may be attributed to the Aberdeen South Harbour which opened in 2023 and offers additional deep-water berths which may continue to result in increases in large vessel arrivals such as cruise liners and jack-ups.
- 8.4.6.6 The most common vessel destinations broadcast in English waters included Tees and Hartlepool, Tyne and Immingham. From DfT data, arrivals at these ports have seen an overall decrease in recent years, although this has likely been influenced by COVID-19, with steadier numbers since. The Immingham Green Energy Terminal was granted Development Consent in February 2025 (PINS, 2025b) and may alter the types and numbers of vessels, particularly tankers within the Shipping and Navigation Study Area. Additionally, the Port of Sunderland announced the completion of expansion works in February 2025 which may lead to increased vessel activity in the future (Port of Sunderland, 2025).
- 8.4.6.7 The Port of Rotterdam was also identified as a common vessel destination and is relevant to both Scottish and English waters. Commercial throughput at Rotterdam showed a steady increase from 2017 to 2021, with more varied trends since owing to sanctions against Russia, geopolitical unrest and low economic growth.

Fishing and recreational activity

- 8.4.6.8 Fishing vessels accounted for 20% of vessels recorded within the Shipping and Navigation Study Area, with a greater presence in English waters than Scottish waters. Trends for fishing activity are difficult to predict in the long-term given the influence of factors such as fish stocks, quotas and climate change. Policy and legislation changes can also have significant influence on the volume of fishing, gear types deployed and the nationality of fishing vessels.
- 8.4.6.9 Recreational vessels accounted for 4% of vessels recorded within the Shipping and Navigation Study Area, again with a greater presence in English waters than Scottish waters. Similarly to fishing vessels, future movements of recreational vessels can be difficult to predict given the changes to types of vessels with sail and electric powered vessels expected to become more prominent in place of diesel. It is expected that the overall level of activity will remain similar or slightly increase in the future, dependent on factors such as climate change and the economy.

8.5 Impact assessment methodology

8.5.1 Overview

- 8.5.1.1 **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** sets out the overarching approach that has been used in developing the preliminary environmental information. For shipping and navigation, the IMO's FSA approach has been used, in line with MCA requirements for shipping and navigation assessment.
- 8.5.1.2 The FSA differs from the standard EIA methodology as it is centred on risk control and assesses each impact in terms of its severity of consequence and frequency of occurrence to then establish the significance of effect via a risk matrix.
- 8.5.1.3 The assessment of shipping and navigation receptors considers:
- Baseline data;
 - Expert opinion;
 - Lessons learnt from previous projects;
 - Level of stakeholder concern;
 - Number of transits of specific vessels, vessel types, or both.

8.5.2 Frequency of occurrence

- 8.5.2.1 The definitions of the frequency of occurrence rankings are provided in **Table 8.6**.

Table 8.6: Frequency of occurrence ranking definitions

Frequency	Definition
Negligible	Less than one occurrence per 10,000 years
Extremely unlikely	One per 100 to 10,000 years
Remote	One per 10 to 100 years
Reasonably probable	One per 1 to 10 years
Frequent	Yearly

8.5.3 Severity of consequence

- 8.5.3.1 The severity of consequence is based upon an aggregate of factors, including consequences to people, property, environment and business. The definitions of the severity of consequence rankings are provided in **Table 8.7**. The tier levels described in **Table 8.7** are defined within the UK National Contingency Plan for Responding to Marine Pollution Incidents (HM Government, 2024).

Table 8.7: Definition of terms relating to the severity of consequence

Description	Definition			
	People	Property	Environment	Business
Negligible	No perceptible risk	No perceptible risk	No perceptible risk	No perceptible risk
Minor	Slight injury(ies)	Minor damage to property, superficial damage (i.e.)	Tier 1 local assistance required	Minor reputational risks – limited to users
Moderate	Multiple minor or single serious injury	Damage not critical to operations	Tier 2 limited external assistance required	Local reputational risks
Serious	Multiple serious injuries or single fatality	Damage resulting in critical risk to operations	Tier 2 regional assistance required	National reputational risks
Major	More than one fatality	Total loss of property	Tier 3 national assistance required	International reputational risks

8.5.4 Significance of effect

- 8.5.4.1 The significance of the effect upon shipping and navigation is determined by correlating the severity of consequence and the frequency of occurrence. The method employed for this assessment is presented in **Table 8.8**.
- 8.5.4.2 Following the classification of an effect using this methodology, a clear statement will then be made as to whether that effect is significant or not significant.

Table 8.8: IMO FSA risk matrix used for the assessment of the significance of the effect

Severity of Consequence	Major	Tolerable	Tolerable	Unacceptable	Unacceptable	Unacceptable
	Serious	Broadly Acceptable	Tolerable	Tolerable	Unacceptable	Unacceptable
	Moderate	Broadly Acceptable	Broadly Acceptable	Tolerable	Tolerable	Unacceptable
	Minor	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Tolerable	Tolerable
	Negligible	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Tolerable
		Negligible	Extremely Unlikely	Remote	Reasonably Probable	Frequent
Frequency of Occurrence						

- 8.5.4.3 **Table 8.9** presents the definitions of the significance classifications and specifies whether these are considered significant in EIA terms.

Table 8.9: Significance definitions

Significance classification	Definition	Significant effect in EIA terms
Unacceptable	The risk level cannot be justified and must be reduced via additional mitigation measures in order to be deemed acceptable.	Significant
Tolerable	Additional mitigation measures may be required to ensure the risk is ALARP. If ALARP, the risk level is considered to be tolerable with mitigation (with the embedded mitigation) and therefore acceptable.	Not significant (if ALARP)
Broadly acceptable	The risk level is considered reasonable with no additional mitigation required.	Not significant

8.5.4.4 Within the impact assessment, account is given to each impact relative to Scottish and English waters, as appropriate. Where the severity of consequence or frequency of occurrence is considered to differ for an impact across Scottish and English waters, this is acknowledged, and the resulting significance of effect is reported separately.

8.5.4.5 It is noted that the assessment in **Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR** uses FSA terminology as required under MGN 654 (MCA, 2021a). Differences in terminology are detailed in **Table 8.10**. This chapter uses the EIA terminology.

Table 8.10: Summary of terminology differences between EIA and NRA for shipping and navigation

EIA Term	NRA Term	Definition
Impact	Hazard	A potential to threaten human life, health, property or the environment.
Commitment	Embedded mitigation measure	A means of controlling a single element of an impact which is embedded (standard or good practice measure utilised or in place).
Secondary mitigation	Additional mitigation measure	A means of controlling a single element of an impact which is additional to the risk with the embedded mitigation in place (required to reduce the risk to ALARP and not significant in EIA terms).
Significance of effect	Significance of risk	The combination of the frequency of occurrence and the severity of consequence of an impact which results in a statement of significance.
Receptor	User	Sufferer of the effect.

8.5.4.6 Although EIA terminology has been adopted throughout the assessment of impacts, it is undertaken within the framework of FSA methodology as described above.

8.5.5 Assumptions and limitations of the assessment

8.5.5.1 Assumptions and limitations relating to the data used to inform the baseline environment are discussed in **Section 8.4.4**. No other assumptions or limitations are considered relating to the shipping and navigation assessment.

8.6 Key parameters for assessment

8.6.1 Scope of the assessment

- 8.6.1.1 A Scoping Report for the MHPGC Project was issued to the PINS and MD-LOT in February 2025 (RPS, 2025). Following consultation with the appropriate statutory bodies, PINS (on behalf of the SoS) and MD-LOT both provided Scoping Opinions in March 2025 (PINS, 2025; MD-LOT, 2025, respectively).
- 8.6.1.2 **Table 8.11** summarises the impacts considered as part of the assessment, while a summary of the effects scoped out of the assessment is presented in **Table 8.12**.

Table 8.11: Impacts scoped into the assessment

Impact	Phase			Potential effects scoped into the assessment
	C	O&M	D	
Increased vessel to vessel collision risk (third-party to MHPGC Project vessel)	✓	✓	✓	There will be a risk of collisions between third-party vessels and MHPGC Project vessels, which will increase the overall risk of collisions.
Increased vessel to vessel collision risk (third-party to third-party)	✓	✓	✓	The presence of MHPGC Project vessels may also lead to an increase in collision risk between third-party vessels given the reduced sea room available for navigation.
Reduced access to local ports and harbours	✓	✗	✓	The presence of MHPGC Project vessels engaged in construction and decommissioning phase activities may lead to a reduction in access to local ports and harbours, particularly for ports and harbours close to landfall, or where routes to and from a port cross the MHPGC Project PEIR Red Line Boundary.
Disruption to fishing and recreational activities	✓	✗	✓	Construction and decommissioning activities may cause disruption to fishing and recreational activity within the MHPGC Project PEIR Red Line Boundary.
Disruption to third-party marine activities	✓	✓	✓	The presence of MHPGC Project vessels may also cause disruption to third-party activities, such as dredging or military activities.
Reduction of under keel clearance	✓	✓	✓	External cable protection during the construction and O&M phase, and if all or part of the offshore export cables remain in place during the decommissioning phase, will reduce navigable water depths and therefore available under keel clearance for vessels will be reduced, which may lead to an increase in grounding risk.
Anchor interaction with subsea cables	✓	✓	✓	There will be a risk of vessel anchors interacting with the offshore export cables during the construction and O&M phases where cable lay has taken place, and if all or part of the offshore export cables remain in place during the decommissioning phase.
Fishing gear interaction with subsea cables	✓	✓	✓	There is potential for fishing vessel gear to interact with the offshore export cables, during the construction and O&M phases where cable lay has taken place, and if all or part of the offshore export cables remain in place during the decommissioning phase.
Interference with navigation, communications and position-fixing equipment	✓	✓	✗	EMF emitted by the offshore export cables during the construction (during testing with the offshore export cables energised) and O&M phases may impact the use of magnetic compasses on board third-party vessels.

C = construction; O&M = operations and maintenance; D = decommissioning

Table 8.12: Impacts scoped out of the assessment

Impact	Justification for scoping out of the assessment
O&M phase	
Reduced access to local ports and harbours	Given large vessel movements during the O&M phase will only be required in the event of repair, minimal disruption to port access is foreseen, particularly considering MHPGC Project activities will be short-term and occur within a limited spatial extent. Over the 35 year operational lifetime, repair and remediation works will comprise up to 245 O&M vessel movements, which includes potential crew transport vessels (CTVs), guard vessels (GV) in addition to larger vessels such as cable lay vessels (CLV), and jack-up vessels.
Disruption to fishing and recreational activities	Given large vessel movements during the O&M phase will only be required in the event repair, minimal disruption to fishing and recreational activities is foreseen, particularly considering MHPGC Project activities will be short-term and occur within a limited spatial extent. Over the 35 year operational lifetime, repair works will comprise up to 245 O&M vessel movements, which includes potential CTVs, GVs in addition to larger vessels such as CLV and jack-up vessels.
Decommissioning phase	
Interference with navigation, communications and position-fixing equipment	During the decommissioning phase, the offshore export cables will not be energised and therefore will not cause interference with navigational equipment.

8.6.2 Maximum design scenario

- 8.6.2.1 The maximum design scenario (MDS) for each impact identified in **Section 8.6.1** has been selected as that having the potential to result in the greatest effect on an identified receptor or receptor group. The MDS presented in **Table 8.13** has been selected from the parameters provided in **Volume 1, Chapter 2: Project Description, of the PEIR** and methodology outlined in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.

Table 8.13: MDS relevant for the assessment of potential impacts on shipping and navigation

Impact	Maximum Design Scenario	Explanation
Note: The cable length measurements are for the maximum distance between the Offshore Substation Platform (OSP) and trenchless drill exit pit unless otherwise stated. For clarity one trench length is as follows: - OSP to exit pit – up to 324.67 km; - OSP to MHWS – up to 326.00 km; - Scottish waters (OSP – Scottish-English Offshore Waters Boundary) – up to 98 km; - English waters (English waters boundary – exit pit) – up to 226.67 km; and - English waters (English waters boundary – MHWS) – up to 228.00km.		
Construction		
Increased vessel to vessel collision risk resulting from Project vessel movements (third party to project vessel)	Construction duration: up to four years (for the offshore export cable corridor). Offshore vessel activity (Scottish and English waters): - There will be up to 550 return trips by installation vessels (including Cable Lay Vessels (CLV), trenching support vessels (TSV), installation support vessel (ISV), guard vessels (GV), survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, crew transport vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); - A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: - There will be up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and dive support vessels (DSV)); - A maximum of 14 vessels may be operational at any one time during the construction phase.	The presence of project vessels introduces a collision risk between third-party vessels and project vessels. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this creates the greatest risk of collisions.

Impact	Maximum Design Scenario	Explanation
	Landfall installation jack-up operations (English waters): Additional vessels to facilitate the trenchless drill installation at the exit pit: • 1 x jack-up vessel; • 1 x barge; • 4 x barge support tugs; • 1 x CSV; • 1 x supply vessel. Details of vessel activities: Installation activities will involve vessels which are restricted in their ability to manoeuvre and will take place on a 24/7 basis. Trenching rate: minimum 70m/hr. Cable and protection lay rate: minimum 50m/hr. Advisory safe passing distances around cable installation vessels: 500m.	
Increased vessel to vessel collision risk resulting from displacement (third party to third party)	Construction duration: up to four years. Offshore vessel activity (Scottish and English waters): • There will be up to 550 return trips by installation vessels (including CLV, TSV, ISV, GV, survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, CTV, rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); • A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: • There will be up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and dive support vessels (DSV)); • A maximum of 14 vessels may be operational at any one time during the construction phase.	The presence of project vessels may lead to vessels being displaced into reduced sea room, leading to an increased collision risk between third-party vessels. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this leads to the greatest displacement and therefore greatest collision risk.

Impact	Maximum Design Scenario	Explanation
	Landfall installation jack-up operations (English waters): Additional vessels to facilitate the trenchless drill exit pit installation: • 1 x jack-up vessel; • 1 x barge; • 4 x barge support tugs; • 1 x CSV; • 1 x supply vessel. Details of vessel activities: Installation activities will involve vessels which are restricted in their ability to manoeuvre and will take place on a 24/7 basis. Trenching rate: minimum 70m/hr. Cable and protection lay rate: minimum 50m/hr. Advisory safe passing distances around cable installation vessels: 500m.	
Reduced access to local ports and harbours	Construction duration: up to four years. Offshore vessel activity (Scottish and English waters): • There will be up to 550 return trips by installation vessels (including Cable Lay Vessels (CLV), trenching support vessels (TSV), installation support vessel (ISV), guard vessels (GV), survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, crew transport vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); • A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: • There will be up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and dive support vessels (DSV));	The presence of project vessels may lead to third-party vessels requiring a longer route to access ports and harbours or temporarily losing access to these while construction is underway. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this leads to the greatest chance of vessels being deviated from existing routes, particularly during works in nearshore areas.

Impact	Maximum Design Scenario	Explanation
	- A maximum of 14 vessels may be operational at any one time during the construction phase. Landfall installation jack-up operations (English waters): Additional vessels to facilitate the trenchless drill exit pit installation: 1 x jack-up vessel; 1 x barge; 4 x barge support tugs; 1 x CSV; 1 x supply vessel. Details of vessel activities: Installation activities will involve vessels which are restricted in their ability to manoeuvre and will take place on a 24/7 basis. Trenching rate: minimum 70m/hr. Cable and protection lay rate: minimum 50m/hr. Advisory safe passing distances around cable installation vessels: 500m.	
Disruption to fishing and recreational activities	Construction duration: up to four years. Offshore vessel activity (Scottish and English waters): - There will be up to 550 return trips by installation vessels (including Cable Lay Vessels (CLV), trenching support vessels (TSV), installation support vessel (ISV), guard vessels (GV), survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, crew transport vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); - A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: - There will be up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels,	The presence of project vessels may lead to fishing and recreational vessels being displaced from their typical locations and potentially being displaced into areas of busier shipping. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this leads to the greatest chance of vessels being displaced.

Impact	Maximum Design Scenario	Explanation
	tug/anchor handlers, cable barge, CTV and dive support vessels (DSV)); - A maximum of 14 vessels may be operational at any one time during the construction phase. Landfall installation jack-up operations (English waters): Additional vessels to facilitate the trenchless drill exit pit installation: 1 x jack-up vessel; 1 x barge; 4 x barge support tugs; 1 x CSV; 1 x supply vessel. Details of vessel activities: Installation activities will involve vessels which are restricted in their ability to manoeuvre and will take place on a 24/7 basis. Trenching rate: minimum 70m/hr. Cable and protection lay rate: minimum 50m/hr. Advisory safe passing distances around cable installation vessels: 500m.	
Disruption to third party marine activities	Construction duration: up to four years. Offshore vessel activity (Scottish and English waters): - There will be up to 550 return trips by installation vessels (including Cable Lay Vessels (CLV), trenching support vessels (TSV), installation support vessel (ISV), guard vessels (GV), survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, crew transport vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); - A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity:	The presence of project vessels may lead to third-party vessels (such as military vessels conducting exercises or dredgers engaged in dredging being displaced from their typical locations and potentially being displaced into areas of busier shipping. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this leads to the greatest chance of vessels being displaced.

Impact	Maximum Design Scenario	Explanation
	- There will be up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and dive support vessels (DSV)); - A maximum of 14 vessels may be operational at any one time during the construction phase. Landfall installation jack-up operations (English waters): Additional vessels to facilitate the trenchless drill exit pit installation: 1 x jack-up vessel; 1 x barge; 4 x barge support tugs; 1 x CSV; 1 x supply vessel. Details of vessel activities: Installation activities will involve vessels which are restricted in their ability to manoeuvre and will take place on a 24/7 basis. Trenching rate: minimum 70m/hr. Cable and protection lay rate: minimum 50m/hr. Advisory safe passing distances around cable installation vessels: 500m.	
Reduction of under-keel clearance as a result of subsea infrastructure	Construction duration: up to four years. Number of trenches: up to two. Maximum length of cables from OSP to Exit Pit: <u>Per trench = 324.67km</u> - Scottish waters: 98km length; - English waters: 226.67km length. Distance between trenches: up to 50m. Percentage of route requiring cable protection from OSP to Exit Pit: 10.69%. Cable protection height: up to 2m.	The presence of subsea cables and their associated protection may reduce the available water depth and therefore under-keel clearance available to vessels where this is above the seabed. This may lead to an increase in grounding risk, particularly in areas of shallow water. The MDS for this impact is the greatest proportion of the cable requiring external protection, including the greatest number of crossings, with the maximum height of crossings assumed.

Impact	Maximum Design Scenario	Explanation
	Number of crossings: up to 16 crossings with existing and planned infrastructure. Crossing protection height: up to 2m. Trenchless drill exit pits (English waters): up to four exit pit locations between 360m and 1,660m from MLWS, in water depths of a minimum of 4m below LAT. Trenchless drill exit pit protection (English waters): backfill, rock placement and mattress protection will be implemented. Maximum height above seabed of 0.35m with intention to restore to original seabed level.	
Anchor interactions with subsea cables	Number of trenches: up to two. Maximum length of cables from OSP to MHWS: <u>Per trench = 326.00km</u> - Scottish waters: 98km length; - English waters: 228km length. Distance between trenches: up to 50m. Percentage of route requiring cable protection from OSP to Exit Pit: 10.69%. Cable protection height: up to 2m. Minimum burial depth: 0.5m (where burial is feasible). Number of crossings: up to 16 crossings with existing and planned infrastructure. Crossing protection height: up to 2m. Trenchless drill exit pits (English waters): up to four exit pit locations between 360m and 1,660m from MLWS, in water depths of a minimum of 4m LAT. Trenchless drill exit pit protection (English waters): backfill, rock placement and mattress protection will be implemented. Maximum height above seabed of 0.35m with intention to restore to original seabed level.	The presence of subsea cables and their associated protection present a risk of vessel anchors interacting and potentially snagging, either due to emergency anchoring or anchor dragging. The MDS for this impact is the greatest length and number of trenches as this gives the greatest possibility of interaction.
Fishing gear interactions with subsea cables	Number of trenches: up to two. Maximum length of cables from OSP to MHWS:	The presence of subsea cables and their associated protection present a risk of fishing gear interacting and potentially snagging,

Impact	Maximum Design Scenario	Explanation
	<u>Per trench = 326.00km</u> - Scottish waters: 98km length; - English waters: 228km length. Distance between trenches: up to 50m. Percentage of route requiring cable protection from OSP to Exit Pit: 10.69%. Cable protection height: up to 2m. Minimum burial depth: 0.5m (where burial is feasible). Number of crossings: up to 16 crossings with existing and planned infrastructure. Crossing protection height: up to 2m. Trenchless drill exit pits (English waters): up to four exit pit locations between 360m and 1,660m from MLWS, in water depths of a minimum of 4m LAT. Trenchless drill exit pit protection (English waters): backfill, rock placement and mattress protection will be implemented. Maximum height above seabed of 0.35m with intention to restore to original seabed level	particularly demersal fishing gear. The MDS for this impact is the greatest length and number of trenches as this gives the greatest possibility of interaction.
Interference with navigation, communications and position fixing equipment	Construction duration: up to four years. Number of cables: up to four cables including two power conductors and two fibre optic cables. Number of trenches: up to two. Maximum length of cables from OSP to MHWS: <u>Per trench = 326.40km</u> - Scottish waters: 98km length; - English waters: 228km length. Distance between trenches: up to 50m. Minimum burial depth: 0.5m (where burial is feasible). Trenchless drill exit pits (English waters): up to four exit pit locations between 360m and 1,660m from MLWS, in water depths of a minimum of 4m LAT.	Electromagnetic field effects relating to the subsea cables may lead to interference with magnetic compasses. The greatest effect would relate to unbundled HVDC cables in separate trenches. The effect will be reduced by burial and will be assessed via a compass deviation study

Impact	Maximum Design Scenario	Explanation
	Trenchless drill exit pit protection (English waters): backfill, rock placement and mattress protection will be implemented. Maximum height above seabed of 0.35m with intention to restore to original seabed level. Maximum magnetic field strength: 440μT.	
Operation and Maintenance		
Increased vessel to vessel collision risk resulting from Project vessel movements (third party to project vessel)	O&M: Operational lifespan of 35 years. Vessel presence: Routine inspection (no remediation/repair) constitutes survey activity (survey vessel) up to 2 surveys per year per trench; duration 2 weeks per survey; 3 return trips per survey; 2 vessel maximum at 1 time per survey. Per year for 2 trenches: • Surveys – 4 • Return trip – 4x3 = 12 • Total vessels at time – 2 Routine inspection (no remediation/repair) constitutes survey activity (USV) up to 2 surveys per year per trench; duration 6 weeks per survey; 110 return trips (up to 4 USV + 1 guard vessel with port call every 4 days) (55 per survey = 110); up to 4 USV + 1 guard vessel = 5 max at 1 time per survey. Per year for 2 trenches: • Surveys – 4 • Return trips – 4x55 = 220 • Total vessels at time – 5 • Remediation (up to 13.056km per year per trench, in different locations along route) Vessels on site for REMEDIATION activities, for up to two trenches:	The presence of project vessels introduces a collision risk between third-party vessels and project vessels. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this creates the greatest risk of collisions.

Impact	Maximum Design Scenario	Explanation
	- Up to four operation and maintenance vessels on site at any one time, comprising a combination of construction support vessel (CSV) and/or Service Operation Vessels (SOV) and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. Vessel movements (remediation), for up to two trenches: - Up to 62 operation and maintenance vessel movements (return trips) each year, consisting of CSV or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. - Repair (41 lifetime repairs, for up to two trenches) Vessels on site for REPAIR activities, for up to two trenches: - Up to four operation and maintenance vessels on site at any one time, comprising a combination of CLV and/or barge and/or Barge Handlers/Tugs and/or Jack-Up and/or CSV and/or CTV and/or Rockdump. Vessel movements (repair), for up to two trenches: - Up to 245 operation and maintenance vessel movements (return trips) over the operational lifetime (35 yrs) consisting of CLV and/or barge and/or Jack-Up and/or Barge Handlers/Tugs and/or CSV and/or CTV and/or Rockdump.	
Increased vessel to vessel collision risk resulting from displacement (third party to third party)	O&M: Operational lifespan of 35 years. Vessel presence: Routine inspection (no remediation/repair) constitutes survey activity (survey vessel) up to 2 surveys per year per trench; duration 2 weeks per survey; 3 return trips per survey; 2 vessel max at 1 time per survey. Per year for 2 trenches: - Surveys – 4 - Return trip – 4x3 = 12	The presence of project vessels may lead to vessels being displaced into reduced sea room, leading to an increased collision risk between third-party vessels. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this leads to the greatest displacement and therefore greatest collision risk.

Impact	Maximum Design Scenario	Explanation
	- Total vessels at time – 2 Routine inspection (no remediation/repair) constitutes survey activity (USV) up to 2 surveys per year per trench; duration 6 weeks per survey; 110 return trips (up to 4 USV + 1 guard vessel with port call every 4 days) (55 per survey = 110); up to 4 USV + 1 guard vessel = 5 max at 1 time per survey. Per year for 2 trenches: - Surveys – 4 - Return trips – 4x55 = 220 - Total vessels at time – 5 - Remediation (up to 13.056km per year per trench, in different locations along route) Vessels on site for REMEDIATION activities, for up to two trenches: - Up to four operation and maintenance vessels on site at any one time, comprising a combination of construction support vessel (CSV) and/or Service Operation Vessels (SOV) and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. Vessel movements (remediation), for up to two trenches: - Up to 62 operation and maintenance vessel movements (return trips) each year, consisting of CSV or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. - Repair (41 lifetime repairs, for up to two trenches) Vessels on site for REPAIR activities, for up to two trenches: - Up to four operation and maintenance vessels on site at any one time, comprising a combination of CLV and/or barge and/or Barge Handlers/Tugs and/or Jack-Up and/or CSV and/or CTV and/or Rockdump.	
Reduction of under-keel clearance as a result of subsea infrastructure	Operational lifetime: up to 35 years. Number of trenches: up to two.	The presence of subsea cables and their associated protection may reduce the available water depth and therefore under-keel clearance

Impact	Maximum Design Scenario	Explanation
	Maximum length of cables from OSP to Exit Pit: <u>Per trench = 324.67km</u> - Scottish waters: 98km length; - English waters: 226.67km length. Distance between trenches: up to 50m. Percentage of route requiring cable protection from OSP to Exit Pit: 10.69%. Cable protection height: up to 2m. Number of crossings: up to 16 crossings with existing and planned infrastructure. Crossing protection height: up to 2m. Trenchless drill exit pits (English waters): up to four exit pit locations between 360m and 1,660m from MLWS, in water depths of a minimum of 4m LAT. Trenchless drill exit pit protection (English waters): backfill, rock placement and mattress protection will be implemented. Maximum height above seabed of 0.35m with intention to restore to original seabed level	available to vessels where this is above the seabed. This may lead to an increase in grounding risk, particularly in areas of shallow water. The MDS for this impact is the greatest proportion of the cable requiring external protection, including the greatest number of crossings, with the maximum height of crossings assumed.
Anchor interactions with subsea cables	Operational lifetime: up to 35 years. Number of trenches: up to two. Maximum length of cables from OSP to MHWS: <u>Per trench = 326.40km</u> - Scottish waters: 98km length; - English waters: 228km length. Distance between trenches: up to 50m. Percentage of route requiring cable protection from OSP to Exit Pit: 10.69%. Cable protection height: up to 2m. Minimum burial depth: 0.5m (where burial is feasible). Number of crossings: up to 16 crossings with existing and planned infrastructure.	The presence of subsea cables and their associated protection present a risk of vessel anchors interacting and potentially snagging, either due to emergency anchoring or anchor dragging. The MDS for this impact is the greatest length and number of trenches as this gives the greatest possibility of interaction.

Impact	Maximum Design Scenario	Explanation
	Crossing protection height: up to 2m. Trenchless drill exit pits (English waters): up to four exit pit locations between 360m and 1,660m from MLWS, in water depths of a minimum of 4m LAT. Trenchless drill exit pit protection (English waters): backfill, rock placement and mattress protection will be implemented. Maximum height above seabed of 0.35m with intention to restore to original seabed level	
Fishing gear interactions with subsea cables	Operational lifetime: up to 35 years. Number of trenches: up to two. Maximum length of cables from OSP to MHWS: <u>Per trench = 326.00 km</u> - Scottish waters: 98km length; - English waters: 228km length. Distance between trenches: up to 50m. Percentage of route requiring cable protection from OSP to Exit Pit: 10.69% Cable protection height: up to 2m. Minimum burial depth: 0.5m (where burial is feasible). Number of crossings: up to 16 crossings with existing and planned infrastructure. Crossing protection height: up to 2m. Trenchless drill exit pits (English waters): up to four exit pit locations between 360m and 1,660m from MLWS, in water depths of a minimum of 4m LAT. Trenchless drill exit pit protection (English waters): backfill, rock placement and mattress protection will be implemented. Maximum height above seabed of 0.35m with intention to restore to original seabed level	The presence of subsea cables and their associated protection present a risk of fishing gear interacting and potentially snagging, particularly demersal fishing gear. The MDS for this impact is the greatest length and number of trenches as this gives the greatest possibility of interaction.
Interference with navigation, communications and position fixing equipment	Operational lifetime: up to 35 years. Number of cables: up to four cables including two power conductors and two fibre optic cables.	Electromagnetic field effects relating to the subsea cables may lead to interference with magnetic compasses. The greatest effect would relate to unbundled HVDC cables in separate trenches. The

Impact	Maximum Design Scenario	Explanation
	Number of trenches: up to two. Maximum length of cables from OSP to MHWS: <u>Per trench = 326.40km</u> - Scottish waters: 98km length; - English waters: 228km length. Distance between trenches: up to 50m. Minimum burial depth: 0.5m (where burial is feasible). Trenchless drill exit pits (English waters): up to four exit pit locations between 360m and 1,660m from MLWS, in water depths of a minimum of 4m LAT. Trenchless drill exit pit protection (English waters): backfill, rock placement and mattress protection will be implemented. Maximum height above seabed of 0.35m with intention to restore to original seabed level. Maximum magnetic field strength: 440μT.	effect will be reduced by burial and will be assessed via a compass deviation study
Decommissioning		
Increased vessel to vessel collision risk resulting from Project vessel movements (third party to project vessel)	Decommissioning Approach: cables and cable protection fully removed.	If the cables and cable protection are to be removed in decommissioning, then the process is anticipated to be the reverse of the construction process, with similar parameters to the equivalent construction phase impact. The presence of project vessels introduces a collision risk between third-party vessels and project vessels. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this creates the greatest risk of collisions.
Increased vessel to vessel collision risk resulting from displacement (third party to third party)	Decommissioning Approach: cables and cable protection fully removed.	If the cables and cable protection are to be removed in decommissioning, then the process is anticipated to be the reverse of the construction process, with similar parameters to the equivalent construction phase impact. The presence of project vessels may lead to vessels being displaced into reduced sea room, leading to an increased collision risk between third-party vessels. The MDS for this is the maximum

Impact	Maximum Design Scenario	Explanation
		number of vessel movements possible, with the maximum number of vessels concurrently present as this leads to the greatest displacement and therefore greatest collision risk.
Reduced access to local ports and harbours	Decommissioning Approach: cables and cable protection fully removed.	If the cables and cable protection are to be removed in decommissioning, then the process is anticipated to be the reverse of the construction process, with similar parameters to the equivalent construction phase impact. The presence of project vessels may lead to third-party vessels requiring a longer route to access ports and harbours or temporarily losing access to these while decommissioning is underway. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this leads to the greatest chance of vessels being deviated from existing routes, particularly during works in nearshore areas.
Disruption to fishing and recreational activities	Decommissioning Approach: cables and cable protection fully removed.	If the cables and cable protection are to be removed in decommissioning, then the process is anticipated to be the reverse of the construction process, with similar parameters to the equivalent construction phase impact. The presence of project vessels may lead to fishing and recreational vessels being displaced from their typical locations and potentially being displaced into areas of busier shipping. The MDS for this is the maximum number of vessel movements possible, with the maximum number of vessels concurrently present as this leads to the greatest chance of vessels being displaced.
Disruption to third party marine activities	Decommissioning Approach: cables and cable protection fully removed.	If the cables and cable protection are to be removed in decommissioning, then the process is anticipated to be the reverse of the construction process, with similar parameters to the equivalent construction phase impact. The presence of project vessels may lead to third-party vessels (such as military vessels conducting exercises or dredgers engaged in dredging being displaced from their typical locations and potentially being displaced into areas of busier shipping. The MDS for this is the maximum number of vessel movements possible,

Impact	Maximum Design Scenario	Explanation
		with the maximum number of vessels concurrently present as this leads to the greatest chance of vessels being displaced.
Reduction of under-keel clearance as a result of subsea infrastructure	Decommissioning Approach: cables remain in-situ following decommissioning – MDS parameters anticipated to align with the equivalent operation and maintenance phase impact.	The presence of subsea cables and their associated protection may reduce the available water depth and therefore under-keel clearance available to vessels where this is above the seabed. This may lead to an increase in grounding risk, particularly in areas of shallow water. The MDS for this impact is the greatest proportion of the cable requiring external protection, including the greatest number of crossings, with the maximum height of crossings assumed.
Anchor interactions with subsea cables	Decommissioning Approach: cables remain in-situ following decommissioning – MDS parameters anticipated to align with the equivalent operation and maintenance phase impact.	The presence of subsea cables and their associated protection present a risk of vessel anchors interacting and potentially snagging, either due to emergency anchoring or anchor dragging. The MDS for this impact is the greatest length and number of trenches as this gives the greatest possibility of interaction.
Fishing gear interactions with subsea cables	Decommissioning Approach: cables remain in-situ following decommissioning – MDS parameters anticipated to align with the equivalent operation and maintenance phase impact.	The presence of subsea cables and their associated protection present a risk of fishing gear interacting and potentially snagging, particularly demersal fishing gear. The MDS for this impact is the greatest length and number of trenches as this gives the greatest possibility of interaction.

8.7 Commitments adopted as part of the MHPGC Project

- 8.7.1.1 As set out in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** and **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**, several commitments have been adopted as part of the MHPGC Project to reduce the potential for impacts on shipping and navigation.
- 8.7.1.2 Commitments (embedded mitigation) include the following measures as identified in the Institute of Environmental Management and Assessment (IEMA) (now renamed as Institute of Sustainability and Environmental Professionals (ISEP)) Guide to Shaping Quality Development (IEMA, 2015):
- Primary mitigation - measures included as part of the project design. IEMA describes these as “modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional action to be taken”. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the project and the parameters secured in the DCO and marine licence, or both;
 - Tertiary mitigation - IEMA describes these as “actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects”.
- 8.7.1.3 Commitments that will form part of the final design (and are established legislative requirements/good practice, or both) have been taken into account as part of the initial assessment presented **Section 8.8** (i.e. the initial determination of significance of effects assumes implementation of these measures). This ensures that the measures that the Applicant is committed to are considered in the assessment of effects.
- 8.7.1.4 Where an assessment identifies likely significant adverse effects, secondary mitigation may be applied. These are measures that could further prevent, reduce and, where possible, offset these effects. They are defined by IEMA as “actions that will require further activity to achieve the anticipated outcome” and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management plan. For secondary mitigation both pre-mitigation and residual effects are presented.
- 8.7.1.5 The measures relevant to shipping and navigation are outlined in **Table 8.14** and considered in the assessment presented in **Section 8.8**. The measures are considered inherently part of the design of the MHPGC Project and the accompanying securing mechanism has been identified.

Table 8.14: Embedded commitments relevant to shipping and navigation implemented as part of the MHPGC Project

Commitment number	Measure adopted	How the measure will be secured
CoT08	An Outline Offshore Cable Specification and Installation Plan (CSIP) will be prepared and submitted with the application for development consent. It will include cable burial to be the preferred option for cable protection, where practicable. A Detailed CSIP will be developed prior to construction in accordance with the Outline CSIP. The Outline CSIP will include (but is not limited to): ▪ A CBRA which will define burial depths and safeguards, based on seabed conditions and external aggression and climate change hazards, to keep the offshore export cables protected and compliant through all project phases while upholding navigational and environmental safety; • The implementation, management and monitoring of cable protection. • Details on the development of the cable installation and protection design within the Farn Deep Nephrops ground, which will seek to maximise cable burial and minimise the requirement for external cable protection, where technically feasible, taking account of cable stability, integrity and other engineering requirements.	• Will be secured via dML condition and/or condition of Scottish Marine Licence(s)
CoT04	Advance warning will be provided via Notice to Mariners (NtMs) to ensure that the appropriate authorities are informed of offshore construction, operation and maintenance, and decommissioning activities. Copies of all notices must be provided to the MMO, MCA and UKHO as well as other interested parties, as appropriate. Early notification will allow appropriate marking of all installed infrastructure on UKHO Admiralty/nautical charts.	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)
CoT19	Ongoing liaison with the fishing industry through the appointment of a Company Fisheries Liaison Officer(s) (CFLO)(s) and adherence to good practice guidance with regards to fisheries liaison (e.g. Fishing Liaison with Offshore Wind and Wet Renewables Group FLOWW (2025) guidance for English Waters).	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)
CoT32	An Advisory Safety Statement to define advisory safe passing distance and use of guard vessels, will be submitted as part of the marine licence application(s) to the Scottish Ministers.	N/A
CoT31	MHPGC Project vessels will display appropriate marks and lights at all times, and broadcast their navigational status on AIS, particularly when Restricted in Ability to Manoeuvre (RAM).	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)

Commitment number	Measure adopted	How the measure will be secured
CoT30	An Outline VTMP will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. A Detailed VTMP will be developed pre-construction substantially in accordance with the Outline VTMP, and in line with the relevant legislation, guidance and industry best practice. The Detailed VTMP will: • Detail vessel routing to and from construction areas and ports to avoid areas of high risk, including liaison with the Port of Seaham; • Include vessel standards and a code of conduct for vessel operators in compliance with international marine regulations as adopted by the Flag State, including the COLREGs (IMO, 1972/77) and the SOLAS (IMO, 1974); • Detail measures to reduce disturbance to marine mammal receptors from transiting vessels, such as slow transit through the MHPGC Project and other measures as detailed in the Outline Marine Mammal Mitigation Protocol; • Detail measures to reduce disturbance to red throated diver from transiting vessels, such as slow transit through the MHPGC Project and other measures as detailed in the Red Throated Diver Protocol.	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)
CoT37	An Outline Marine Pollution Contingency Plan (MPCP) will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent. The Outline MPCP will describe the hazards, response strategies, and step-by-step actions for handling spills, contaminant releases (including details of non-toxic, biodegradable drilling fluids), and vessel collisions during construction or operations below MHWS, and will include all essential emergency contacts and information. A Detailed MPCP will be developed substantially in accordance with the Outline MPCP.	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)
CoT28	An Outline Navigational Safety Plan will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent. It will detail measures to ensure compliance with international marine regulations. A Detailed Navigational Safety Plan will be developed in accordance with the outline plan.	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)

Commitment number	Measure adopted	How the measure will be secured
CoT52	The Applicant will ensure compliance with MGN 654 and all annexes, where these apply to the offshore export cables. In particular, the MCA's requirements on water depth reductions will be met. Specifically, where the offshore export cables and associated protection will reduce water depths by more than 5%, further detailed assessment will be carried out based on finalised design, and consultation will be undertaken with the MCA and the relevant General Lighthouse Authority (Trinity House in English waters, Northern Lighthouse Board in Scottish Waters). This will be set out in the Outline Navigational Safety Plan that will form part of the Outline Offshore Environmental Management Plan, which will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish Ministers.	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)
CoT53	The Applicant acknowledges advice issued by the MMO and MCA in respect of electromagnetic deviation on ships' compasses. In particular, the MCA's requirement that for 95% of the cable route a three-degree deviation is acceptable, for the remaining 5% of the cable route no more than five degrees will be attained. Where the preliminary assessment does not align with MCA guidance, an updated desk based compass deviation study will be undertaken prior to construction on the final cable specifications, and consultation undertaken with the MCA. A post lay deviation survey may be required with results shared with the UKHO via a hydrographic note (H102).	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)

Commitment number	Measure adopted	How the measure will be secured
CoT06	An Outline OEMP will be prepared and submitted with the application for development consent, and as part of the marine licence application(s) to the Scottish Ministers. A Detailed OEMP will be developed in accordance with the Outline OEMP. The Outline OEMP will include: • An Outline Marine Biosecurity Plan; • An Outline MPCP; • An Outline Marine Mammal Mitigation Protocol; • An Outline VTMP; • An Outline Navigational Safety Plan; • A chemical risk assessment that includes information such as how chemicals will be used, stored, and transported, in line with recognised best-practice guidance; • A dropped-object protocol will be established to cover the reporting and recovery of any items lost overboard that could endanger other sea users; • A Marine Emergency Action Card outlining the steps to be followed in the case of a marine emergency; • Provisions for the handling and disposal of waste.	• Will be secured via dML condition and/or condition of Scottish Marine Licence(s)
CoT44	An Offshore Decommissioning Programme will be developed and submitted to the MMO and MD-LOT prior to the commencement of any offshore construction. It will be in line with the latest relevant legislation and available guidance at the time of production, as far as reasonably practicable.	Will be secured via dML condition and/or condition of Scottish Marine Licence(s)

8.8 Assessment of impacts

8.8.1 Overview

- 8.8.1.1 This section includes the assessment of the impacts to shipping and navigation arising from the construction, O&M and decommissioning phases of the MHPGC Project. A summary of the effects is presented in **Table 8.42**.

8.8.2 Construction phase

Increased vessel to vessel collision risk (MHPGC Project vessel to third-party)

- 8.8.2.1 During the construction phase, there will be a risk of collisions between third-party vessels and MHPGC Project vessels, which will increase the overall risk of collisions. Construction activities will include vessels such as jack-ups and CLVs which are large, slow-moving vessels and will be RAM. These vessels will therefore have limited ability to take collision avoidance action should a vessel encounter scenario arise whilst undertaking construction phase activities. The greatest increase in collision risk will be in high density areas of vessel traffic, such as the approaches to Sunderland and where routes from the Tyne and Forth ports cross the MHPGC Project PEIR Red Line Boundary.
- 8.8.2.2 The construction phase for the offshore export cables is expected to last up to four years. There will be a number of activities taking place within the construction phase, including route preparation, landfall works, cable lay and post-lay burial and protection works. Cable lay and protection works are both expected to take place on a 24/7 basis, to minimise the overall disruption caused and to shorten the overall construction phase. During the construction phase, activities will be mobile along the length of the offshore export cable corridor, with the exception of the landfall where works may take longer to bring the cable ashore via trenchless technologies.

Frequency of occurrence

- 8.8.2.3 The increased collision risk will be present throughout the construction phase. The numbers and types of vessels present dependent on the ongoing construction activity, with the maximum number of vessels on site at one time being 33 on the offshore route and 14 in the landfall area during the construction phase. A full breakdown of the types and numbers of vessels involved is provided in the MDS table in **Table 8.13**. Large vessels which are RAM, such as jack-ups and CLVs, will carry the greatest risk of collision as these are limited in their ability to avoid collisions. Construction activities will move along the MHPGC Project PEIR Red Line Boundary, meaning any specific area is affected for a limited time only. There may be situations where activity is ongoing at multiple sections of the MHPGC Project PEIR Red Line Boundary at one time, for example where burial and laying is taking place in different sections concurrently, however the maximum number of vessels on site at one time would remain at 33 for the offshore route and 14 for the landfall activities. Landfall activities may also involve a longer-term collision risk, as vessels supporting the trenchless landfall works will be present in the same location for a longer timeframe.
- 8.8.2.4 Commitments in place to mitigate risk of collision are listed in **Section 8.7**, including a number of measures aimed to increase awareness of ongoing works, such as marking and lighting ,of MHPGC Project vessels including broadcasting on AIS (CoT31), and promulgation of information (CoT04). These measures will ensure third-party vessels are aware of the works ongoing and can appropriately passage plan.
- All MHPGC Project vessels will comply with Flag State Regulations including adhering to SOLAS and the COLREGs (CoT30/MM-078). Adherence to the COLREGs includes Rule 18, which governs the behaviour of vessels in situations where one is RAM, in order to reduce the risk of collision (CoT30/MM-078). MHPGC Project vessels engaged in construction works will also request advisory safe passing distances from third-party vessels, in order to minimise the likelihood of encounters and potential collision scenarios occurring (CoT32/MM-086).
- 8.8.2.5 In English waters, where the offshore export cable corridor passes through busier areas of shipping, there is a greater risk of vessel collision. Sufficient sea room to pass safely is still available, particularly with sufficient notice of planned construction works. Therefore, in English waters the frequency of occurrence is considered to be **remote**.

- 8.8.2.6 In Scottish waters, landfall works are not relevant, while traffic volumes and other navigational constraints are also less significant. Therefore, it is anticipated the frequency of occurrence is **extremely unlikely**.

Severity of consequence

- 8.8.2.7 The most likely consequences of a collision between a MHPGC Project vessel and a third-party vessel would be a minor contact resulting in minor property damage, minor reputational effects on business and no perceptible effect on people. In more severe cases, a collision may lead to significant vessel damage, which could cause vessel foundering, Potential Loss of Life (PLL) and pollution. If a collision were to involve a smaller vessel, such as a recreational craft, then the worst-case consequences of foundering may be more likely than the case involving a commercial vessel, as smaller vessels may have weaker structural integrity. In the event of pollution, environmental damage would be managed via the MPCP (CoT37).

- 8.8.2.8 It is noted that emergency response resources may be more readily available in English waters than in Scottish waters, where the MHPGC Project PEIR Red Line Boundary is generally closer to the coast and thus closer to more resources, such as the RNLI. However, the consequences will primarily be driven by the nature of the contact between the MHPGC Project vessel and third-party vessel. Therefore, the severity of consequence is considered to be **moderate** for Scottish and English waters.

Significance of effect

- 8.8.2.9 In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.
- 8.8.2.10 In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **tolerable with mitigation**.

Secondary mitigation and residual effect

- 8.8.2.11 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of increased vessel to vessel collision risk (MHPGC Project vessel to third-party), during the construction phase in Scottish waters, is considered to be **broadly acceptable**, which is not significant in EIA terms. In English waters, the impact is considered to be **tolerable with mitigation**, which is not significant in EIA terms.

Increased vessel to vessel collision risk (third-party to third-party)

- 8.8.2.12 The presence of MHPGC Project vessels may also lead to an increase in collision risk between third-party vessels. Construction phase activities will involve vessels restricted in their ability to manoeuvre (RAM), and therefore under COLREGs, third-party vessels are typically required to deviate around these. These deviations may lead to an increase in vessel encounters, with the potential for these to develop into collision incidents. This will be most prevalent in high density areas of shipping, such as where routes from Sunderland and the Tyne cross the MHPGC Project PEIR Red Line Boundary.

Frequency of occurrence

- 8.8.2.13 The numbers and types of vessels present dependent on the ongoing construction activity, with the maximum number of vessels on site at one time being 33 on the offshore route and 14 in the landfall area during the four-year construction phase. A full breakdown of the types and numbers of vessels involved is provided in the MDS table in **Table 8.13**. Large vessels which are RAM, are most likely to instigate deviations from third-party vessels given their footprint and inability to take avoiding action. Construction phase activities will move along the MHPGC Project PEIR Red Line Boundary, meaning any specific area is affected for a limited time only. There may be situations where activity is ongoing at multiple sections of the offshore export cable corridor at one time, for example where burial and laying is taking place in different places concurrently, however the maximum number of vessels on site at one time would remain at 33 for the offshore route and 14 for the landfall activities. Landfall activities may also involve a longer-term collision risk, as vessels supporting the trenchless landfall works will be present in the same place for a longer timeframe.
- 8.8.2.14 Throughout the construction phase, the movements of MHPGC Project vessels will be managed via marine coordination and will display appropriate marks and lights, as secured via the VTMP

(CoT31/MM-085). MHPGC Project vessels will also broadcast on AIS, including an appropriate navigational status, particularly those vessels which are RAM (CoT31/MM-085). This will assist with ensuring third-party vessels are aware of the presence of MHPGC Project vessels, both for passage planning in advance and dynamically whilst in transit. With greater awareness, third-party vessels can more readily deviate and avoid encounter situations with other third-party vessels.

- 8.8.2.15 Promulgation of information will also ensure vessels are aware of the works ongoing and will include use of Notices to Mariners, as well as targeted information provided to local ports and harbours (CoT04/MM-004).
- 8.8.2.16 In Scottish waters, landfall works are not relevant, while traffic volumes and other navigational constraints are also less significant (however noting all shipping and navigation commitments are applicable to the MHPGC Project in both English and Scottish waters). Given these factors alongside the lesser extent of the construction activities, it is anticipated the frequency of occurrence in Scottish waters is **negligible**.
- 8.8.2.17 In English waters, where the MHPGC Project PEIR Red Line Boundary passes through busier areas of shipping, there is a greater risk of vessel collision. Sufficient sea room for multiple vessels to pass safely is still available, particularly with sufficient notice of planned construction phase activities. Therefore, in English waters the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

- 8.8.2.18 The most likely consequences of a collision between two third-party vessels are similar to the consequences of a collision between a third-party vessel and a MHPGC Project vessel, as discussed in **Paragraph 8.8.2.7**. Therefore, the severity of consequence is considered to be **moderate** for Scottish and English waters.

Significance of effect

- 8.8.2.19 In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.
- 8.8.2.20 In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.

Secondary mitigation and residual effect

- 8.8.2.21 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of increased vessel to vessel collision risk (third-party to third-party), during the construction phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Reduced access to local ports and harbours

- 8.8.2.22 The presence of MHPGC Project vessels engaged in construction activities may lead to a reduction in access to local ports and harbours. This is most likely to affect those ports and harbours close to landfall, or where routes to and from a port cross the MHPGC Project PEIR Red Line Boundary. Given the distance offshore in Scottish waters, it is expected that this is only relevant to the MHPGC Project in English waters. In particular, Seaham is most likely to be potentially directly affected, being located approximately 0.9nm north of landfall. Based on the analysis of AIS data, the Port of Seaham is most commonly used by cargo vessels between 75m and 112m in length. In addition, vessels on routes to the Port of Tyne and Port of Sunderland may be affected, as there are routes to/from these ports crossing the MHPGC Project PEIR Red Line Boundary.
- 8.8.2.23 Port access is most likely to be impacted by the presence of vessels which are RAM, which may require vessels to deviate to avoid them, particularly where these operate in constrained areas. The approaches to Tyne and Sunderland within the Shipping and Navigation Study Area are relatively unconstrained by navigational features and water depths, therefore it is expected that with appropriate awareness and passage planning, the reduction in access to these ports would be limited.
- 8.8.2.24 The Port of Seaham may have a potential greater reduction in access due to the proximity to landfall, however, approaches to Seaham from the south along the coast are not commonly recorded on AIS,

and therefore landfall works are not expected to reduce access. Cable lay operations within the MHPGC Project PEIR Red Line Boundary may lead to a temporary loss of access, with routes from Seaham crossing the MHPGC Project PEIR Red Line Boundary approximately 1.8nm offshore. It is noted that multiple approaches to Seaham were recorded in the AIS data analysed in **Section 8.4**, so alternative approaches are likely to be possible in the event that construction phase activities are taking place across an access channel. Liaison with the Port of Seaham during the construction phase will be undertaken to ensure that access is not lost in the event that multiple sets of works are ongoing concurrently (secured through the Outline VTMP as part of the Outline OEMP).

- 8.8.2.25 During consultation undertaken to inform the assessment (see **Section 8.3.2**) neither Seaham nor Sunderland expressed any concern over port access, with Sunderland noting that adequate navigational warnings should be sufficient mitigation as noted in **Table 8.4**.

Frequency of occurrence

- 8.8.2.26 Key commitments relating to port and harbour access will involve the promulgation of information, to ensure that vessels accessing Seaham are informed of works and able to carry out suitable passage planning (CoT04/MM-004). This can be undertaken via Notices to Mariners, as well as liaison directly with the Port of Seaham. In addition, vessels engaged in construction activities will broadcast on AIS (CoT31/MM-085), with appropriate navigational status, and will adhere to all Flag State Regulations (CoT30/MM-078).
- 8.8.2.27 Due to the distance from the MHPGC Project PEIR Red Line Boundary to local ports and harbours, the frequency of occurrence in Scottish waters is considered to be **negligible**.
- 8.8.2.28 Within English waters, it is expected that the reduction in access will be greatest at the Port of Seaham, when cable lay activities would cross routes used by vessels accessing the harbour. Given the cable lay will be mobile, any reduction in access would be short-term, and confined to highly localised area at any one time. However, at landfall, works may take longer given the implementation of trenchless technologies. Therefore, the frequency of occurrence in English waters is considered to be **reasonably probable**.

Severity of consequence

- 8.8.2.29 The most likely consequences of a reduction in port access are minor reputational effects on business, but no perceptible effect on people or property. Effects on commercial ferry operators, such as those operating from the Port of Tyne, would be more significant given the regular nature of transits, however it is considered that any effect on timetables will be very short-term and limited in scale. No commercial ferries operate out of the Port of Seaham. Therefore, the severity of consequence is considered to be **minor** for Scottish and English waters.

Significance of effect

- 8.8.2.30 In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be **broadly acceptable**.
- 8.8.2.31 In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be **tolerable with mitigation**.

Secondary mitigation and residual effect

- 8.8.2.32 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of reduced access to local ports and harbours during the construction phase in Scottish waters, is considered to be **broadly acceptable**, which is not significant in EIA terms. In English waters, the impact is considered to be **tolerable with mitigation**, which is not significant in EIA terms.

Disruption to fishing and recreational activities

- 8.8.2.33 Construction activities may cause disruption to fishing and recreational activity within the Shipping and Navigation Study Area. The baseline analysis showed the presence of fishing and recreational activity throughout the Shipping and Navigation Study Area, with recreational activity most common in nearshore areas. Fishing activity generally consisted of otter trawling vessels and those using pots

and traps, with fishing predominantly recorded in English waters, in the southern third of the Shipping and Navigation Study Area. It was noted during consultation that both fishing and recreational activities are under-represented on AIS, with recreational volumes estimated to be up to four times higher than recorded, and an active potter fleet out of Sunderland not fully represented on AIS. Construction phase activities may lead to the displacement of fishing and recreational vessels from their typical areas into busier areas of shipping, which may result in an increase in encounters with larger commercial vessels. This impact will be present throughout the construction phase but will be greatest when slow-moving larger vessels such as CLVs are present, or during landfall activities in nearshore areas.

- 8.8.2.34 Construction phase activities will be mobile along the length of the offshore export cable corridor, therefore disruption in any one location will be short-term, and affect a limited spatial extent. The exception to this is at landfall, where works may be present for a more extended period.
- 8.8.2.35 Given the consequence of disruption to fishing activities is primarily a commercial issue not directly relating to navigational safety, the risk is assessed fully in **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR**. Similarly, disruption to recreational activities are assessed in **Volume 2, Chapter 10: Infrastructure and Other Sea Users, of the PEIR**. Navigational safety risks to fishing and recreational vessels, such as collision and grounding risk, are considered elsewhere within this assessment alongside other vessel types for collision impacts.

Disruption to third-party marine activities

- 8.8.2.36 Similarly to the impact of disruption to recreational and fishing activity, the presence of construction vessels may also cause disruption to third-party activities, such as dredging or military activities. The MHPGC Project PEIR Red Line Boundary overlaps one military exercise area, a Royal Air Force (RAF) firing practice area (see **Figure 8.2**). A small number of military vessels were recorded on AIS, with these generally on transit, noting that military vessels are not obliged to broadcast on AIS.
- 8.8.2.37 Dredgers were also recorded within the Shipping and Navigation Study Area, with these typically being on transit, or visiting spoil grounds from the Port of Seaham, the Port of Sunderland and the Port of Tyne. Close to landfall at Seaham, a dredger was recorded making several trips over the course of two weeks in November 2024 between Seaham and the Nose's Point spoil ground located 160m north of the MHPGC Project PEIR Red Line Boundary close to landfall. Similar activity was also recorded with dredgers out of Sunderland making trips between the port and a spoil ground approximately 1.5nm outside port limits. In both cases, dredging was carried out periodically and was not continuously carried out throughout the 12 months of AIS data. Further north, dredgers operating from the Port of Tyne were recorded visiting a spoil ground approximately 3nm northwest of the MHPGC Project PEIR Red Line Boundary. Dredgers visiting this spoil ground were recorded throughout the year. A route between Tyne and marine aggregate dredge areas at the Humber was also observed, crossing the MHPGC Project PEIR Red Line Boundary around 7nm offshore.

Frequency of occurrence

- 8.8.2.38 Information on construction phase activities will be promulgated via a number of means, including Notices to Mariners, which will allow third-party operators to plan appropriately (CoT04/MM-004). Construction vessels will also broadcast on AIS (CoT31/MM-085), display appropriate marks and lights (CoT31/MM-085), and will follow all Flag State Regulations (CoT30/MM-078). To minimise overall disruption, cable lay and protection activities are expected to operate on a 24/7 basis. As construction will move along the MHPGC Project PEIR Red Line Boundary throughout the construction phase, disruption in any one location is expected to be short-term and of a limited spatial extent.
- 8.8.2.39 Given the lack of third-party marine activities within Scottish waters, the frequency of occurrence in Scottish waters is considered to be **negligible**.
- 8.8.2.40 There was limited military activity within the Shipping and Navigation Study Area, and dredging activity within English waters was not consistent throughout the year, it is anticipated that there will be limited disruption to third-party activities. The frequency of occurrence in English waters is therefore considered to be **remote**.

Severity of consequence

- 8.8.2.41 The most likely consequence of disruption to third-party marine activity is minor reputational effects on business, with no perceptible impact on people. The severity of consequence is considered to be **minor** in both Scottish and English waters.

Significance of effect

- 8.8.2.42 In Scottish waters, the frequency of occurrence is considered to be negligible, and the severity of consequence is minor. Therefore, the significance of effect is considered to be **broadly acceptable**.
- 8.8.2.43 In English waters, the frequency of occurrence is considered to be remote, and the severity of consequence is minor. Therefore, the significance of effect is considered to be **broadly acceptable**.

Secondary mitigation and residual effect

- 8.8.2.44 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of disruption to third-party marine activities, during the construction phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Reduction in under keel clearance

- 8.8.2.45 While burial is anticipated to be the primary means of protection for the offshore export cables, external cable protection will be required where sufficient burial cannot be achieved, as informed by the CBRA. External cable protection above the seabed will also be required at crossings with other subsea infrastructure. Given the protection will reduce navigable water depths, available under keel clearance for vessels will be reduced, which may lead to an increase in grounding risk.
- 8.8.2.46 External protection is anticipated to be required along up to 10.69% of the offshore export cable corridor between the offshore substation platform and the trenchless drill exit point, with a height of up to 2m. This corresponds to a total length of 35.07km of cable protection over the length of each trench, with up to two trenches expected. Each trench is anticipated to be up to 324.67km in length between these two locations, with up to 98km in Scottish waters and 226.67km in English waters. With up to 12 crossings for up to two trenches (based on existing subsea infrastructure), protection of up to 2m above the seabed will be installed. Crossings with existing cables (i.e. those charted) are in water depths of approximately 90m below CD, indicating that under keel clearance will not be adversely affected.
- 8.8.2.47 The average vessel draught within the Shipping and Navigation Study Area was 5.6m, with the maximum draught recorded being 20.6m. Vessel with deeper draughts were generally recorded crossing the MHPGC Project PEIR Red Line Boundary in areas where water depths exceed 50m and therefore reduced under keel clearance will not increase grounding risk in these areas. Vessel draughts in nearshore areas with water depths less than 10m below CD, where external protection may reduce water depth by a greater proportion, were typically below 3m, and grounding risk is therefore not expected to be increased.
- 8.8.2.48 If external cable protection reduces navigable water depths by more than 5% in any area, detailed assessment and further consultation with the MCA and the relevant GLA (NLB in Scottish waters and Trinity House in English waters) will be undertaken to ensure that navigational safety is not compromised, in line with MGN 654. Based on the maximum external protection height, this is expected to be limited to where water depths are 40m below CD or less, which is restricted to the area up to approximately 5nm offshore, noting that as above, vessel draughts in nearshore areas mean that vessel safety is unlikely to be affected even in nearshore areas. The area where depths are below 40m therefore includes the approach to landfall and trenchless techniques exit pits.
- 8.8.2.49 At landfall, a trenchless technique will be utilised, meaning that there will be no water depth reduction where this is used. The exit pit is expected to be between 360m to 1,660m from MLWS, in water depths of a minimum 4m below LAT. While it is planned to restore the exit pits to seabed level, there may be external protection required up to a maximum height of 0.35m.

Frequency of occurrence

- 8.8.2.50 During the construction phase, promulgation of information will be a key measure to ensure that mariners are aware of any reductions in under keel clearance, particularly in shallow waters close to shore (CoT04/MM-004). GVs will also be deployed where deemed necessary via a risk assessment to increase vessel awareness, as secured within the Advisory Safety Statement (CoT32/MM-086).
- 8.8.2.51 Due to water depths in proximity to the MHPGC Project PEIR Red Line Boundary in Scottish waters, the frequency of occurrence in Scottish waters is considered to be **negligible**.
- 8.8.2.52 Within English waters, charted cable crossings are in water depths of approximately 90m below CD, meaning that reduced under keel clearance will not be sufficient to increase grounding risk in these areas. In nearshore areas where water depths are shallower, any external protection above the existing seabed level may lead to an increase in grounding risk if it is required. However, with consideration of the trenchless technique for cable installation, this will be limited in extent and deeper draught vessels were not recorded navigating in this area. During the construction phase, the proportion of the offshore export cables and associated protection which are in place will increase over the duration of the phase, being completed at the end of the construction phase and therefore the increased grounding risk will be localised to areas which have been installed. The frequency of occurrence in English waters is considered to be **extremely unlikely**.

Severity of consequence

- 8.8.2.53 In the event of a vessel grounding, the most likely consequences are minor property damage and minor reputational effects on business, but no perceptible effect on people. More severe groundings may result in vessel foundering, leading to PLL and pollution. In the event of pollution, the MPCP would be implemented to reduce environmental impacts (CoT37). Given the shallow waters within the Shipping and Navigation Study Area are close to shore, any grounding is likely to be in close proximity to emergency response resources, which reduces the likelihood of worst case consequences. Therefore, the severity of consequence is considered to be **moderate** in both Scottish and English waters.

Significance of effect

- 8.8.2.54 In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.
- 8.8.2.55 In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.

Secondary mitigation and residual effect

- 8.8.2.56 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of reduction in under keel clearance, during the construction phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Anchor interaction with subsea cables

- 8.8.2.57 There will be a risk of vessel anchors interacting with the offshore export cables during the construction phase where cable lay has taken place. This may occur due to vessels dropping anchor in an emergency, or an anchored vessel losing its holding ground and dragging anchor along the seabed and over the cable.
- 8.8.2.58 In an emergency situation, a vessel may choose to drop anchor to arrest a drift, particularly if there is a risk of this developing into a more severe scenario such as a collision, allision, or grounding. Within Scottish waters, where the MHPGC Project PEIR Red Line Boundary is located further offshore, it may be more likely that vessels attempt to repair a fault or await assistance, rather than dropping anchor, as there are fewer other hazards which may encourage emergency anchoring, such as shallow waters, busy shipping lanes or surface infrastructure.
- 8.8.2.59 In English waters, especially high density traffic areas such as routes associated with the Tyne and Sunderland, vessels may have a greater risk of emergency anchoring due to the increased traffic volumes, while vessels in the nearshore areas may be more likely to drop anchor to avoid grounding.

The sea area surrounding the MHPGC Project PEIR Red Line Boundary is generally relatively open seas which may allow vessels more time for decision making. During consultation see **Section 8.3.2**, the Port of Seaham indicated that anchor dragging was uncommon in the area off Seaham, but there had been instances.

- 8.8.2.60 Incident data from both the RNLI and MAIB reviewed in **Section 8.4** showed that machinery failures were among the more common incident types in the Shipping and Navigation Study Area. While not all machinery failures lead to drifting, some may include blackouts which can cause vessel drifting to occur. In such cases, dropping anchor may be preferable to drifting to prevent the scenarios outlined above.
- 8.8.2.61 There is also a possibility of a vessel at anchor dragging their anchor over the offshore export cables, particularly in severe weather. This is naturally most likely to occur in areas of high anchoring activity such as off Seaham, approximately 0.6nm north of the MHPGC Project PEIR Red Line Boundary, the Whiskey anchorage associated with Teesport (approximately 0.6nm from the MHPGC Project PEIR Red Line Boundary), located to the south of the MHPGC Project PEIR Red Line Boundary, or to the northwest of the MHPGC Project PEIR Red Line Boundary off Sunderland (approximately 2.5nm from the MHPGC Project PEIR Red Line Boundary). The locations of anchored vessels and charted anchorages are presented in **Figure 8.6**. Due to the location of the MHPGC Project PEIR Red Line Boundary in Scottish waters, anchoring activity is not typical and therefore anchor dragging is considered highly unlikely.
- 8.8.2.62 During the construction phase, the offshore export cables may be unburied following cable lay or be exposed while awaiting the installation of external protection. During this time, the risk of vessel anchors interacting with the offshore export cables will be greatest, as even small vessel anchors may interact with cables. Once cable protection is in place or burial implemented, the greatest threat will be associated with the anchors of larger vessels, which may penetrate deeper and cause greater damage. **Volume 2, Annex 8.2: Cable Burial Risk Assessment, of the PEIR** recommends a target burial depth of 0.5m.

Frequency of occurrence

- 8.8.2.63 Promulgation of information will be a key measure to ensure that mariners are aware of the presence of the offshore export cables when anchoring, particularly where there are exposed sections of cable (CoT04/MM-004). GVs will also be deployed where required to ensure that adequate notice is given of exposed cable sections and to discourage vessels from dropping anchor over the exposed cables (CoT32/MM-086).
- 8.8.2.64 Due to water depths in proximity to the MHPGC Project PEIR Red Line Boundary in Scottish waters and the limited anchoring activity so far offshore, the frequency of occurrence in Scottish waters is considered to be **negligible**.
- 8.8.2.65 During the construction phase, it is noted that there may be a period where some or all of the offshore export cables are exposed while awaiting burial or protection works. During this time there may be greater risk of interaction, however, the deployment of GVs and promulgation of information are expected to discourage anchoring in proximity to the offshore export cables. The frequency of occurrence in English waters is considered to be **remote**.

Severity of consequence

- 8.8.2.66 Burial and protection measures will mean that the greatest threat to the offshore export cables comes from larger vessel anchors, which have greater penetration depth and can cause more damage than the anchor of a smaller vessel.
- 8.8.2.67 In the event of an anchor snagging on the offshore export cables, there may be a risk of injury when trying to free the anchor. If the anchor cannot be freed, the safest course of action is to slip the anchor rather than attempting to raise or cut the cable.
- 8.8.2.68 The most likely consequences are damage to property (either the anchoring vessel or subsea cables), with larger vessel anchors having the potential to cause more severe damage. The scale of the damage may also depend on the nature of the interaction. In the event of pollution, the MPCP would be implemented to reduce environmental impacts (CoT37).

8.8.2.69 Therefore, the severity of consequence is considered to be **moderate** in both Scottish and English waters.

Significance of effect

8.8.2.70 In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.

8.8.2.71 In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **tolerable with mitigation**.

Secondary mitigation and residual effect

8.8.2.72 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of anchor interaction with subsea cables, during the construction phase in Scottish waters, is considered to be **broadly acceptable**, which is not significant in EIA terms. In English waters, the impact is considered to be **tolerable with mitigation**, which is not significant in EIA terms.

Fishing gear interaction with subsea cables

8.8.2.73 Similarly to the impact of anchor interaction, there is potential for fishing vessel gear to interact within the offshore export cables during the construction phase. Fishing gears, in use, in the Shipping and Navigation Study Area included otter bottom trawls, otter twin trawls and static pots and traps. Otter bottom trawls and otter twin trawls are demersal fishing gears which interact with the seabed and are therefore more likely to interact with the offshore export cables. Fishing activity within the Shipping and Navigation Study Area was more frequent within English waters, particularly within the southern section, with limited active fishing recorded in Scottish waters both on AIS and VMS.

Frequency of occurrence

8.8.2.74 During the construction phase, there may be a period where the offshore export cables are laid but burial or protection measures not yet implemented. While this is the case, there is a greater risk of fishing gear interaction with the cables, and a greater possibility of interaction leading to snagging.

8.8.2.75 Promulgation of information (CoT04/MM-004) is expected to discourage fishing activity in the vicinity of the offshore export cables. It is, however, the responsibility of fishers to risk assesses where they choose to fish. Commercial issues relating to fishing activity are considered in **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR**. GVs will also be deployed where required, which will help to ensure that fishers are aware of the offshore export cables, particularly where there are any exposures (CoT32/MM-086). An FLO will also be appointed to liaise with the fishing industry, further aiding awareness (CoT19/MM-032).

8.8.2.76 Given the limited active fishing in Scottish waters, particularly involving demersal fishing gears, the frequency of occurrence in Scottish waters is considered to be **negligible**.

8.8.2.77 In English waters, there is more regular activity with demersal gears such as otter bottom trawls, which may be more likely to interact and snag on the offshore export cables, particularly if there is a period during which they are exposed on the seabed. Commitments such as the deployment of GVs, appointment of an FLO and promulgation of information reduce the likelihood of demersal fishing over exposed cables, while cable protection is considered to suitably protect against fishing gear interactions, once installed. Therefore, the frequency of occurrence in English waters is considered to be **remote**.

Severity of consequence

8.8.2.78 Demersal fishing gear may snag on the offshore export cables, in which the crew response may be to reduce or reverse the propulsive force, attempt to unfasten the equipment, or release the gear from the vessel. In the majority of snagging incidents, it should therefore be possible to avoid any serious consequences. Data from the MAIB shows that snagging incidents do not always result in the safe freeing of the vessel. Consequences may include damage to the gear, vessel or offshore export cables, loss of stability, or in the worst case, the capsize of the vessel. Should a vessel capsize, there is a risk of injury or fatality. There is a greater risk of capsizing if a vessel attempts to

raise the snagged cable, rather than releasing their gear. Therefore, the severity of consequence is therefore considered to be **moderate** in both Scottish and English waters.

Significance of effect

8.8.2.79 In Scottish waters, the frequency of occurrence is considered to be negligible, and the severity of consequence is serious, therefore the significance of effect is expected to be **broadly acceptable**.

8.8.2.80 In English waters, the frequency of occurrence is considered to be remote, and the severity of consequence is serious, therefore the significance of effect is expected to be **tolerable with mitigation**.

Secondary mitigation and residual effect

8.8.2.81 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of fishing gear interaction with subsea cables, during the construction phase in Scottish waters, is considered to be **broadly acceptable**, which is not significant in EIA terms. In English waters, the impact is considered to be **tolerable with mitigation**, which is not significant in EIA terms.

Interference with navigation, communication and position-fixing equipment

8.8.2.82 Magnetic compasses, which are navigational instruments used for determining direction relative to the Earth's magnetic poles, rely on magnetic fields and may therefore be affected by EMF emitted from power cables. While the majority of commercial vessels use non-magnetic gyrocompasses for navigation, they may carry a magnetic compass as a backup in the event of power loss. Smaller craft such as fishing or recreational vessels may still rely on magnetic compasses as their primary means of navigation.

8.8.2.83 The MCA's scoping response states that a three-degree electromagnetic compass deviation for 95% of the cable route and five degree deviation for the remaining 5% of the cable route would be acceptable. Where it cannot be demonstrated that this is met, the MCA response notes that a post-installation deviation survey may be requested to confirm conformity with the stated limits.

8.8.2.84 EMF effects on magnetic compasses are affected by spacing of the offshore export cables, water depth, the burial of the cables and the type of current running through the cables. There are proposed to be up to two HVDC offshore export cables in trenches with a maximum separation distance of 50m. As HVDC produces a stronger electromagnetic field than High Voltage Alternating Current (HVAC) equivalents, and the offshore export cables may be located in separate trenches, there may be interference on magnetic compasses at the surface.

8.8.2.85 Compass deviation effects have been assessed within a separate EMF compass deviation assessment in **Volume 2, Annex 8.3: Marine EMF Compass and Deviation Report, of the PEIR**. The conclusions drawn in this assessment included that the maximum compass deviation occurred at landfall where the water is most shallow and that the MCA's requirements outlined above may not be achieved, depending on the final design of the offshore export cables. The findings of the EMF compass deviation assessment will be used to inform final design including consideration of separation distance (up to a maximum of 50m), bundling of offshore export cables and burial depth.

8.8.2.86 Once the cable specification is confirmed, the compass deviation assessment will be updated and if necessary, the Applicant will engage with the MCA where their requirements cannot be achieved, including undertaking a post lay deviation survey where requested.

Frequency of occurrence

8.8.2.87 This hazard will only occur during period of testing while the offshore export cables are energised, and therefore the frequency of occurrence is expected to be relatively low.

8.8.2.88 The MHPGC Project PEIR Red Line Boundary within Scottish waters is located in water depths that make the vertical separation from the offshore export cables too great for magnetic compasses to be affected. Therefore, the frequency of occurrence in Scottish waters is considered to be **negligible**.

8.8.2.89 In English waters, the water depths within the majority of the MHPGC Project PEIR Red Line Boundary are sufficient to render interference negligible. However, in coastal areas approaching landfall, there may be greater interference. Vessel traffic on AIS in this area was limited, noting that small craft

relying on magnetic compasses may not broadcast on AIS. Therefore, accounting for the findings of the current EMF compass deviation assessment, it is considered that the frequency of occurrence in English waters is **reasonably probable**.

Severity of consequence

8.8.2.90 As noted above, smaller craft such as recreational vessels may rely more heavily on magnetic compasses as their primary means of navigation. As vessel pass close to the cables, they may experience deviation of compasses, leading to being directed off course. Given the interference with magnetic compasses would be expected to be brief as vessels pass over the cables, any course deviation would be expected to be small, short-term and quickly corrected. In the most extreme cases, a vessel deviating from its course due to compass deviation may be directed into shallower waters, which may increase grounding risk, or towards other potential hazards. Furthermore, given the charting of the cables with any magnetic anomalies reported, vessels would be expected to be aware of the potential for compass deviation. Vessels also generally have access to additional means of navigation, which make the worst-case consequences less likely.

8.8.2.91 Therefore, the severity of consequence is therefore considered to be **minor** in both Scottish and English waters.

Significance of effect

8.8.2.92 In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be **broadly acceptable**.

8.8.2.93 In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be **tolerable with mitigation**.

Secondary mitigation and residual effect

8.8.2.94 In Scottish waters, no secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of interference with navigational equipment, during the O&M phase in Scottish waters, is considered to be **broadly acceptable**, which is not significant in EIA terms. In English waters, the residual effect is considered to be **tolerable with mitigation** which is not significant in EIA terms.

8.8.3 O&M phase

Increased vessel to vessel collision risk (MHPGC Project vessel to third-party)

8.8.3.1 Similarly to the construction phase, the presence of MHPGC Project vessels engaged in O&M activities may lead to an increase in collision risk between third-party vessels and MHPGC Project vessels. There will be fewer vessels involved in project activities during the O&M phase when compared to the construction phase, with typical vessel numbers being up to two survey vessels, five vessels involved in USV surveys, four O&M vessels for remediation and four O&M vessels for repairs on site at any one time. Activities are anticipated to be limited to routine surveys as part of the monitoring programme, with remedial works on protection or the offshore export cables carried out as the need is identified. If cable repairs are required, this may require CLVs, which are RAM, to undertake the work. Up to 41 cable repair events expected over the 35-year operational lifespan. Over the operational lifetime, up to 245 vessel movements associated with repairs are expected, with the majority of these consisting of CTVs. Annual vessel movements associated with surveys and remediation are expected to total 294 movements per year, with the majority of these comprised of USV and GVs relating to survey activities.

Frequency of occurrence

8.8.3.2 The increased collision risk will be present throughout the anticipated 35-year O&M phase. During this time, MHPGC Project vessel activities are expected to be infrequent, with eight survey and inspections per year, while remedial works on cable protection or cable repairs undertaken as required on a campaign basis. Remedial works are anticipated to require up to 62 vessels trips per year, while repairs are expected to require an average of seven trips per year over the project lifetime. A total of 15 vessels are expected to be on site at any one time, including the potential for cable

repair or remediation occurring concurrently with survey work. If cable repairs are required, this may involve CLVs, which are RAM and therefore have limited ability to take collision avoidance action. Given the relatively low number of activities spread throughout the O&M phase, the probability of collisions between MHPGC Project vessels and third-party vessels is low.

8.8.3.3 As per the construction phase, promulgation of information will be a key commitment to ensure third-party vessels are aware of ongoing works (CoT04/MM-004). Vessels undertaking O&M phase activities will broadcast on AIS, with appropriate navigational status (CoT31/MM-085), and will adhere to Flag State Regulations, including SOLAS and the COLREGs (CoT30/MM-078). Where identified as necessary, GVs will also be deployed. Local ports and harbours would also be contacted where O&M phase activities are in proximity.

8.8.3.4 Therefore, the frequency of occurrence in both Scottish and English waters is considered to be **extremely unlikely**.

Severity of consequence

8.8.3.5 As per the construction phase [see **Paragraph 8.8.2.8**], the severity of consequence is considered to be **moderate**.

Significance of effect

8.8.3.6 Overall, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable** for both Scottish and English waters.

Secondary mitigation and residual effect

8.8.3.7 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of increased vessel to vessel collision risk (MHPGC Project vessel to third-party), during the O&M phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Increased vessel to vessel collision risk (third-party to third-party)

8.8.3.8 As per the construction phase, the presence of MHPGC Project vessels may lead to third-party vessels being required to deviate and therefore increase collision risk. This will particularly be the case if cable repairs require CLVs, which are RAM.

Frequency of occurrence

8.8.3.9 The increased collision risk will be present throughout the anticipated 35-year O&M phase. During this time, MHPGC Project vessel activities are expected to be infrequent, with up to eight surveys per year between survey vessels and USV, while remedial works on cable protection or cable repairs carried out as required on a campaign basis. A total of 15 vessels are expected to be on site at any one time, including the potential for cable repair or remediation occurring concurrently with survey work. Up to 41 cable repair events are anticipated over the operational lifetime, which may involve CLVs which are RAM and therefore have limited ability to take collision avoidance action. Annual vessel movements associated with surveys and remediation are expected to total 294 movements per year, with the majority of these comprised of USV and GVs relating to survey activities. Given the relatively low number of activities spread throughout the O&M phase, the increased collision risk between third-party vessels during the O&M phase is expected to be very low.

8.8.3.10 Similarly to the construction phase, key commitments will centre on ensuring mariners are aware of the ongoing works, including via promulgation of information and vessels broadcasting (with appropriate navigational status) on AIS (CoT04/MM-004, CoT31/MM-085). GVs may also be deployed where deemed necessary (CoT32/MM-086).

8.8.3.11 Therefore, the frequency of occurrence in both Scottish and English waters is considered to be **negligible**.

Severity of consequence

8.8.3.12 As per the construction phase [see **Paragraph 8.8.2.18**], the severity of consequence is considered to be **moderate** in both Scottish and English waters.

Significance of effect

- 8.8.3.13 Overall, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect in both Scottish and English waters is considered to be **broadly acceptable**.

Secondary mitigation and residual effect

- 8.8.3.14 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of increased vessel to vessel collision risk (third-party to third-party), during the O&M phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Disruption to third-party marine activities

- 8.8.3.15 During the O&M phase, disruption to third-party marine activities may remain. In particular, dredgers associated with the Port of Seaham were recorded using a spoil ground beyond the northern edge of the MHPGC Project PEIR Red Line Boundary close to landfall. Given the refinement of the MHPGC Project PEIR Red Line Boundary from the MHPGC Project Scoping Red Line Boundary, to avoid this spoil ground, it is considered that any disruption to vessels operating in this area will be very limited, and manageable via appropriate communication between vessels and promulgation of information.
- 8.8.3.16 Other activities involving dredgers was recorded within the Shipping and Navigation Study Area out of the ports of Sunderland and Tyne, however these activities were approximately 3.4nm and 4.6nm to the northwest of the MHPGC Project PEIR Red Line Boundary, respectively, and are therefore considered unlikely to be disrupted by O&M phase activities associated with the MHPGC Project.

Frequency of occurrence

- 8.8.3.17 Given the lack of third-party marine activities within Scottish waters, the frequency of occurrence in Scottish waters is considered to be **negligible**.
- 8.8.3.18 Given there was limited military and dredging activity within the Shipping and Navigation Study Area, and dredging activity was not consistent throughout the year, it is anticipated that there will be limited disruption to third-party activities. Furthermore, limited vessel presence is anticipated throughout the O&M phase. The frequency of occurrence for the MHPGC Project PEIR Red Line Boundary in English waters is therefore considered to be **extremely unlikely**.

Severity of consequence

- 8.8.3.19 The most likely consequence of disruption to third-party marine activity is minor reputational effects on business, particularly dredging activities out of Seaham, with no perceptible impact on people. The severity of consequence is considered to be **minor** in both Scottish and English waters.

Significance of effect

- 8.8.3.20 In Scottish waters, the frequency of occurrence is considered to be negligible, and the severity of consequence is minor. Therefore, the significance of effect is considered to be **broadly acceptable**.
- 8.8.3.21 In English waters, the frequency of occurrence is considered to be extremely unlikely, and the severity of consequence is minor. Therefore, the significance of effect is considered to be **broadly acceptable**.

Secondary mitigation and residual effect

- 8.8.3.22 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of disruption to third-party marine activities, during the O&M phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Reduction in under keel clearance

- 8.8.3.23 As per the construction phase, the presence of external cable protection measures may lead to a reduction in under keel clearance and therefore an increase in grounding risk. External protection is anticipated to be required along up to 10.69% of the MHPGC Project PEIR Red Line Boundary, with the requirement for external protection informed by the findings of **Volume 2, Annex 8.2: Cable Burial**

Risk Assessment, of the PEIR. Where required, external protection will have a height of up to 2m, with the height variable dependent on the requirements and type of protection installed. At up to 12 crossings for two trenches (based on existing subsea infrastructure) , protection of up to 2m above the seabed will be installed, again noting that individual designs of the crossings may vary following consultation with the asset owner. Crossings with existing cables (i.e. those charted) are in water depths of approximately 90m below CD, meaning that under keel clearance will not be adversely affected.

- 8.8.3.24 If external cable protection reduces water depths by more than 5% in any area, detailed assessment and further consultation with the MCA and the relevant GLA (NLB in Scottish waters and Trinity House in English waters) will be undertaken to ensure that navigational safety is not compromised, in line with MGN 654 (CoT52/ MM-089).
- 8.8.3.25 At landfall, a trenchless technique will be utilised, meaning that there will be no water depth reduction where the trenchless technique occurs. The exit pit is expected to be 360m to 1,660m from MLWS, in water depths of a minimum 4m LAT. While it is planned to restore the exit pits to seabed level, there may be external protection required up to a maximum height of 0.35m.

Frequency of occurrence

- 8.8.3.26 Due to water depths in proximity to the MHPGC Project PEIR Red Line Boundary in Scottish waters, the frequency of occurrence in Scottish waters is considered to be **negligible**.
- 8.8.3.27 Within English waters, charted cable crossings are in water depths of approximately 90m below CD, meaning that reduced under keel clearance will not be sufficient to increase grounding risk in these areas. In nearshore areas where water depths are shallower, external protection may lead to an increase in grounding risk if it is required. During the O&M phase, the full extent of the offshore export cables will be installed, and the increased grounding risk will be present throughout the O&M phase. During the O&M phase, external protection and burial will be monitored, with the possibility that additional remedial works and external protection will be required, which may add further areas of reduced water depth. The frequency of occurrence in English waters is considered to be **extremely unlikely**.

Severity of consequence

- 8.8.3.28 In the event of a vessel grounding, the most likely consequences are minor property damage and minor reputational effects on business, but no perceptible effect on people. More severe groundings may result in vessel foundering, leading to PLL and pollution. In the event of pollution, the MPCP would be implemented to reduce environmental impacts (CoT37). As per the construction phase, the likelihood of worst-case consequences is reduced given the shallow waters are also closest to the coast, and therefore in closer proximity to emergency response resources. Therefore, the severity of consequence is considered to be **moderate** in both Scottish and English waters.

Significance of effect

- 8.8.3.29 In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.
- 8.8.3.30 In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.

Secondary mitigation and residual effect

- 8.8.3.31 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of reduction in under keel clearance, during the O&M phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Anchor interaction with subsea cables

- 8.8.3.32 As per the construction phase, there is a risk that vessel anchors interact with the offshore export cables and associated external protection during the O&M phase.
- 8.8.3.33 Once laid, the key commitment against anchor interaction will be burial and protection measures. The offshore export cables will be buried to an indicative target burial depth of 0.5m, as

recommended by **Volume 2, Annex 8.2: Cable Burial Risk Assessment, of the PEIR**. Where burial is not feasible including at crossings with other infrastructure, external protection will be installed.

Frequency of occurrence

- 8.8.3.34 The offshore export cables will also be depicted on UKHO Admiralty Charts, which will inform any decision to anchor as part of good seamanship (CoT04). An accompanying warning regarding anchoring, trawling and other seabed operations will be included on the charts. Regulation 34 of SOLAS dictates that the presence of subsea cables will inform any decision to anchor, so it is not expected that third-party vessels will anchor over the offshore export cables in ordinary circumstances. In an emergency situation however, time available to assess the surroundings may be limited, and a vessel may choose to anchor over the cables rather than drift towards a hazard.
- 8.8.3.35 Throughout the O&M phase, up to eight surveys per year will be undertaken to ensure the burial and protection remains in place (CoT08).
- 8.8.3.36 Due to water depths in proximity to the MHPGC Project PEIR Red Line Boundary in Scottish waters and the limited anchoring activity so far offshore, the frequency of occurrence in Scottish waters is considered to be **negligible**.
- 8.8.3.37 Once installed, the cable protection measures and charting of the offshore export cables are expected to greatly reduce the likelihood of vessel anchors interacting with the offshore export cables. The frequency of occurrence in English waters is considered to be **extremely unlikely**.

Severity of consequence

- 8.8.3.38 Burial and protection measures will mean that the greatest threat to the offshore export cables comes from larger vessel anchors, which have greater penetration depth and can cause more damage than the anchor of a smaller vessel.
- 8.8.3.39 In the event of an anchor snagging on the offshore export cables, there may be a risk of injury when trying to free the anchor. If the anchor cannot be free, the safest course of action is to slip the anchor rather than attempting to raise or cut the cable.
- 8.8.3.40 The most likely consequences are damage to property (either the anchoring vessel or subsea cables), with larger vessel anchors having the potential to cause more severe damage. The scale of the damage may also depend on the nature of the interaction. In the event of pollution, the MPCP would be implemented to reduce environmental impacts.
- 8.8.3.41 Therefore, the severity of consequence is considered to be **moderate** in both Scottish and English waters.

Significance of effect

- 8.8.3.42 In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.
- 8.8.3.43 In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be **broadly acceptable**.

Secondary mitigation and residual effect

- 8.8.3.44 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of anchor interaction with subsea cables, during the O&M phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Fishing gear interaction with subsea cables

- 8.8.3.45 As per the construction phase, there will be a risk of fishing gear interaction with the offshore export cables during the O&M phase.
- 8.8.3.46 Once laid, the offshore export cables will be marked on UKHO Admiralty Charts, with an associated note regarding trawling, anchoring or seabed operations. This would inform the decisions of fishers on their choice of fishing grounds as part of good seamanship. The primary means of protecting the offshore export cables will be via burial, as informed by **Volume 2, Annex 8.2: Cable Burial Risk**

Assessment, of the PEIR. Where burial is not feasible, external protection will be installed to achieve sufficient protection. Protection and burial will be monitored throughout the O&M phase to ensure they remain in place.

Frequency of occurrence

- 8.8.3.47 The cable protection, informed by the findings of the CBRA), are assumed to provide appropriate mitigation against fishing gear snagging (CoT08/MM-010). This, alongside depiction on charts and promulgation of information is expected to discourage fishing activity in the vicinity of the offshore export cables (CoT04/MM-004). It is, however, the responsibility of fishers to risk assess where they choose to fish. Commercial issues relating to fishing activity are considered in **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR.**
- 8.8.3.48 While monitoring will be carried out regularly to ensure protection measures remain in place (CoT08/MM-010), if the mobility of the seabed leads to cable exposures, there will be a greater risk of fishing gear interaction where the cables are exposed.
- 8.8.3.49 Given the limited active fishing in Scottish waters, particularly involving demersal fishing gears, the frequency of occurrence in Scottish waters is considered to be **negligible**.
- 8.8.3.50 In English waters, there was more regular activity with demersal gears such as otter bottom trawls, which may be more likely to interact and snag on the offshore export cables. Cable protection and the charting of the offshore export cables is considered to suitably mitigate against fishing gear interactions during the O&M phase. Therefore, the frequency of occurrence in English waters is considered to be **extremely unlikely**.

Severity of consequence

- 8.8.3.51 Demersal fishing gear may snag on the offshore export cables, in which the crew response may be to reduce or reverse the propulsive force, attempt to unfasten the equipment, or release the gear from the vessel. In the majority of snagging incidents, it should therefore be possible to avoid any serious consequences. Data from the MAIB shows that snagging incidents do not always result in the safe freeing of the vessel. Consequences may include damage to the gear, vessel or offshore export cables, loss of stability, or in the worst case, the capsizing of the vessel. Should a vessel capsize, there is a risk of injury or fatality. There is a greater risk of capsizing if a vessel attempts to raise the snagged cable, rather than releasing their gear. Therefore, the severity of consequence is therefore considered to be **moderate** in both Scottish and English waters.

Significance of effect

- 8.8.3.52 In Scottish waters, the frequency of occurrence is considered to be negligible, and the severity of consequence is moderate, therefore the significance of effect is expected to be **broadly acceptable**.
- 8.8.3.53 In English waters, the frequency of occurrence is considered to be extremely unlikely, and the severity of consequence is moderate, therefore the significance of effect is expected to be **broadly acceptable**.

Secondary mitigation and residual effect

- 8.8.3.54 No secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of anchor interaction with subsea cables, during the construction phase in both Scottish and English waters, is considered to be **broadly acceptable**, which is not significant in EIA terms.

Interference with navigation, communications and position-fixing equipment

- 8.8.3.55 The offshore export cables will be energised throughout the O&M phase. Therefore the assessment of this impact for the construction phase is also applicable to the O&M phase, with the exception that the impact will be applicable at all times.

Frequency of occurrence

- 8.8.3.56 As per the construction phase, the MHPGC Project PEIR Red Line Boundary within Scottish waters is located in water depths that make the vertical separation from the offshore export cables too great for magnetic compasses to be affected. Therefore, the frequency of occurrence in Scottish waters is considered to be **negligible**.

8.8.3.57 In English waters, the water depths within the majority of the MHPGC Project PEIR Red Line Boundary are sufficient to render interference negligible. However, in coastal areas approaching landfall, there may be greater interference. Vessel traffic on AIS in this area was limited, noting that small craft relying on magnetic compasses may not broadcast on AIS. Therefore, accounting for the findings of the current EMF compass deviation assessment, it is considered that the frequency of occurrence in English waters is **frequent**.

Severity of consequence

8.8.3.58 As noted above, smaller craft such as recreational vessels may rely more heavily on magnetic compasses as their primary means of navigation. As vessel pass close to the cables, they may experience deviation of compasses, leading to being directed off course. Given the interference with magnetic compasses would be expected to be brief as vessels pass over the cables, any course deviation would be expected to be small, short-term and quickly corrected. In the most extreme cases, a vessel deviating from its course due to compass deviation may be directed into shallower waters, which may increase grounding risk, or towards other potential hazards. Furthermore, given the charting of the cables with any magnetic anomalies reported, vessels would be expected to be aware of the potential for compass deviation. Vessels also generally have access to additional means of navigation, which make the worst-case consequences less likely.

8.8.3.59 Therefore, the severity of consequence is therefore considered to be **minor** in both Scottish and English waters.

Significance of effect

8.8.3.60 In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be **broadly acceptable**.

8.8.3.61 In English waters, the frequency of occurrence is frequent and the severity of consequence is minor. Therefore, the significance of effect is considered to be **tolerable with mitigation**.

Secondary mitigation and residual effect

8.8.3.62 In Scottish waters, no secondary mitigation measures are considered necessary because the impact, in the absence of further mitigation (beyond the embedded mitigation outlined in **Section 8.7**), is considered ALARP, which is not significant in EIA terms. Therefore, the residual effect of interference with navigational equipment, during the O&M phase in Scottish waters, is considered to be **broadly acceptable**, which is not significant in EIA terms. In English waters, the residual effect is considered to be **tolerable with mitigation** which is not significant in EIA terms.

8.8.4 Decommissioning phase

8.8.4.1 The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be the reverse of the construction phase activities, and therefore for the following impacts the significance of effect is considered to be the same as determined for the construction phase:

- Increased vessel to vessel collision risk (MHPGC Project vessel to third-party);
- Increased vessel to vessel collision risk (third-party to third-party);
- Reduced access to local ports and harbours;
- Disruption to fishing and recreational activities;
- Disruption to third-party marine activities.

8.8.4.2 Similarly, if the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for the following impacts the significance of effect is considered to be the same as determined for the O&M phase:

- Reduction in under keel clearance;
- Anchor interaction with subsea cables;
- Fishing gear interaction with subsea cables.

8.9 Whole project assessment and Cumulative Effects Assessment methodology

8.9.1 Methodology

- 8.9.1.1 The Morven Programme comprises four distinct projects: Morven North, Morven South, MHPGC Project, and Morven Branxton Area Grid Connection Project (MBAGC Project).
- 8.9.1.2 The following assessment scenarios have been considered to identify the potential impacts in combination with other projects or plans on the same receptor [see **Table 8.15**].
- Whole project assessment: to identify the potential impacts associated with MHPGC Project together with either Morven North or Morven South in turn, (Scenario 1: Morven North and Scenario 2: Morven South), each of which would comprise a “Whole Project”.
 - Morven Programme assessment: to identify potential impacts associated with all four components of the Morven Programme (Scenario 3);
 - Cumulative effects assessment (CEA): to identify the potential impacts associated with MHPGC Project and with relevant third-party projects, plans and activities, using a tiered approach (including Morven North, Morven South and the MBAGC Project).

Table 8.15: Scenarios to be considered in the MHPGC Project whole project assessment and cumulative effects assessment for Shipping and Navigation

Whole project assessment		Morven Programme assessment	CEA
Scenario 1	Scenario 2	Scenario 3	Scenario 4
MHPGC Project and Morven North	MHPGC Project and Morven South	MHPGC Project, Morven North, Morven South and MBAGC Project	MHPGC Project, and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in

- 8.9.1.3 The projects and plans selected as relevant are based upon the results of a screening exercise (see **Volume 1, Annex 4.3: Cumulative Screening and Location Plan, of the PEIR**). Each project or plan has been considered on a case-by-case basis for screening in or out of the Shipping and Navigation chapter, based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.
- 8.9.1.4 In undertaking the CEA for MHPGC Project, it should be noted that other projects and plans under consideration will have differing potential for proceeding to an operational stage and hence a differing potential to ultimately contribute to a cumulative impact alongside MHPGC Project. Therefore, a tiered approach has been adopted, whereby all third-party projects and plans considered have been allocated into ‘tiers’ reflecting their current stage within the planning and development process. This provides a framework for placing relative weight upon the potential for each project/plan included in the CEA to ultimately be realised, based upon the project/plan’s current stage of maturity and certainty in the project/plan’s parameters. The tiered approach utilised within the MHPGC Project CEA employs the following tiers:

- Tier 1 assessment – Existing developments either built (operational) or under construction¹; approved developments awaiting implementation; and permitted/submitted application(s), but not yet determined, plus Morven North and Morven South;
- Tier 2 assessment – All plans/projects assessed under Tier 1, plus plans/projects where a scoping report has been submitted and is in the public domain;
- Tier 3 assessment – All plans/projects assessed under Tier 1 and 2, plus MBAGC Project, and plans/projects that are reasonably foreseeable (e.g. projects identified in development plans, projects in other plans and programmes, offshore renewable energy projects that have a Crown Estate Scotland Lease Option Agreement).

8.9.1.5 The specific projects and plans screened into the CEA for Shipping and Navigation are outlined in **Table 8.16**.

8.9.1.6 All impacts considered for the MHPGC Project alone have also been considered within the CEA (listed in **Table 8.11**).

¹ Note that existing developments are included in Tier 1 CEA long list but are generally screened out of the CEA assessments, aside from the following exceptions:

1) Existing developments which were not present at the time of baseline characterisation, where a potential cumulative impact-receptor pathway has been identified.

2) Existing developments are screened into tier 1 assessments for specific topics where there is a large conceptual, temporal and spatial overlap between project impacts. In these instances, the potential for ongoing effects through cumulative impact-receptor pathways throughout project lifetime, across the development phases, means that they are considered within quantitative assessment for these topic CEAs (e.g., offshore ornithology assessments consider the cumulative effects of operational offshore wind farms).

Table 8.16: List of other projects and plans considered within the Cumulative Effects Assessment for Shipping and Navigation

Project/plan	Status	Distance from MHPGC Project (km/nm)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Tier 1						
Offshore wind projects and associated cables						
Morven North	Application submitted, awaiting decision	0.00km/0.00nm	Proposed for up to 96 turbines.	2033-2042	2038 to 2073-2077	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Morven South	Application submitted, awaiting decision	0.00km/0.00nm	Proposed for up to 95 turbines.	2033-2042	2038 to 2073-2077	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Berwick Bank Cambois Connection Export Cable	Consented	0.25km/0.13nm	Up to four export cables and four fibre optic cables associated with the Berwick Bank Offshore Wind Farm	2028-2031	2031-2066	Yes. Overlap of operational phase with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from MHPGC Project (km/nm)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Ossian	Application submitted, awaiting decision	5.50km/2.97nm	Proposed for up to 265 floating turbines and up to 15 offshore substation platforms	2031-2034	2034-2069	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Bowdun OWF	Application submitted, awaiting decision	10.03/5.41nm	Up to 67 wind turbines, up to three offshore substation platforms and up to three export cables	2031-2034	2034-2069	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Berwick Bank	Consented	18.22/9.84nm	Up to 307 wind turbines, ten offshore substation platforms and eight offshore export cables	2028-2031	2031-2066	Yes. Overlap of operational phase with the construction or operational phases of MHPGC Project.
Other cables and pipelines						
Eastern Green Link (EGL) 1	Under construction	0.00km/0.00nm	Power cable running from Torness to Hawthorn Pit			Yes. Potential for operational phase to interact with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from MHPGC Project (km/nm)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
EGL2	Under construction	0.00km/0.00nm	Power cable running from Peterhead to Drax	2026-2029	2029 onwards	Yes. Potential for operational phase to interact with the construction or operational phases of MHPGC Project.
Tier 2						
Other cables and pipelines						
EGL 3 subsea cable	Scoping report published	2.33/1.26nm	2 GW HVDC link between Fife and King's Lynn	2027-2033	2034 onwards	Yes. Potential for construction phase or operational phase to interact with the construction or operational phases of MHPGC Project.
EGL 4 subsea cable	Scoping report published	0.00km/0.00nm	2 GW HVDC link between Fife and Lincolnshire	2028-2032	2032 onwards	Yes. Potential for construction phase or operational phase to interact with the construction or operational phases of MHPGC Project.
Tier 3						
Offshore wind projects and associated cables						

Project/plan	Status	Distance from MHPGC Project (km/nm)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
MBAGC Project	Pre-application	0	Potential transmission for Morven North or Morven South	Unknown	Unknown	Unknown. Construction, O&M and decommissioning phases may overlap with MHPGC Project construction, O&M and decommissioning phases.
Other cables and pipelines						
EGL 5 subsea cable	Pre-application	1.25/0.67nm	Power cable running from Lincolnshire to Peterhead	Unknown	Unknown	Unknown. Construction, O&M and decommissioning phases may overlap with MHPGC Project construction, O&M and decommissioning phases.

8.9.2 Maximum design scenario – Whole project assessment and Cumulative Effects Assessment

- 8.9.2.1 The MDSs identified in **Table 8.17** have been selected as those having the potential to result in the greatest potential effect on an identified receptor or receptor group in relation to the whole project assessment and CEA. The MDSs have been based on the MHPGC Project alone assessment MDS (**Table 8.13**), as well as publicly available information on other third-party projects and plans that have been screened into the CEA (**Table 8.16**). Where applicable, the Morven North and Morven South alone assessment MDSs, and project information available for MBAGC Project have also informed the MDSs outlined in **Table 8.17**.

Table 8.17: MDS considered for the whole project and cumulative effects assessments on shipping and navigation

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
Increased vessel to vessel collision risk resulting from MHPGC Project vessel movements (third party to MHPGC Project vessel)	✓	✓	✓	Scenario 1 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with: Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5	The CEA considers all other projects and plans which may contribute to the increased collision risk. Greatest effect will be where additional vessels are displaced into the MHPGC Project PEIR Red Line Boundary.

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
Increased vessel to vessel collision risk resulting from displacement (third party to third party)	✓	✓	✓	Scenario 1 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with: Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5.	The CEA considers all other projects and plans which may contribute to the increased collision risk. Greatest effect will be where additional vessels are displaced into the MHPGC Project PEIR Red Line Boundary.
Reduced access to local ports and harbours	✓	x	✓	Scenario 1	The CEA considers all other projects and plans which may contribute to the increased collision risk. Greatest effect will be where other plans and projects

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
				MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively: Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5	have overlapping works in nearshore areas in proximity to the landfall, closest to port approaches.
Disruption to fishing and recreational activities	✓	x	✓	Scenario 1 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North.	Greatest disruption will occur where simultaneous works take place in areas of higher fishing and recreational activity, such as in nearshore areas and the south of the Shipping and Navigation Study Area.

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
				<u>Scenario 2</u> MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South. <u>Scenario 3</u> MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project. <u>Scenario 4</u> MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with: Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5	
Disruption to third party marine activities (i.e. dredging)	✓	✓	✓	<u>Scenario 1</u> MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North. <u>Scenario 2</u>	Greatest disruption will occur where simultaneous works take place in areas of higher third-party activity, such as in nearshore areas around the Nose's Point spoil ground.

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
				MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with: Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5	
Reduction of under-keel clearance as a result of subsea infrastructure	✓	✓	✓	Scenario 1 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South.	The greatest effect will be where additional crossings are required with other projects and plans involving subsea infrastructure, particularly in shallow waters where depth reductions may lead to greater risk of grounding.

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
				<u>Scenario 3</u> MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project. <u>Scenario 4</u> MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with: Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5	
Anchor interactions with subsea cables	✓	✓	✓	<u>Scenario 1</u> MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North. <u>Scenario 2</u> MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South. <u>Scenario 3</u>	The greatest effect will be where additional vessels are displaced into the MHPGC Project PEIR Red Line Boundary, and where other plans and projects lead to vessels having less open sea room available, as this may influence anchoring decisions.

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
				MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with: Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5	
Fishing gear interactions with subsea cables from a navigational safety perspective	✓	✓	✓	Scenario 1 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project.	The greatest effect will be where additional fishing vessels are displaced into the MHPGC Project PEIR Red Line Boundary but other projects and plans, increasing the number of vessels which may snag gear on the cables.

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
				Scenario 4 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with: Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5	
Interference with navigation, communications and position fixing equipment	x	✓	x	Scenario 1 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with Morven North, Morven South and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 8.13), assessed cumulatively with:	The greatest effect will occur where vessels, particularly small vessels which may not have alternative means of navigation are displaced into the MHPGC Project PEIR Red Line Boundary in nearshore areas, or where subsea infrastructure in similar areas may increase the overall area affected by electromagnetic interference with the navigational equipment.

Potential Cumulative Effect	Phase			Maximum Design Scenario	Justification
	C	O	D		
				Tier 1: Morven North Morven South Ossian Berwick Bank (and Cambois Connection) Bowdun OWF EGL1 EGL2 Tier 2: EGL3 EGL4 Tier 3: MBAGC Project EGL5	

C= Construction, O= Operations and maintenance, D= Decommissioning phases

"✓" is used to denote the phase the potential impact can occur, "X" outlines there is no impact

8.10 Whole project assessment and Cumulative Effects Assessment

8.10.1 Overview

- 8.10.1.1 A description of the significance of the whole project and CEA upon shipping and navigation receptors for each identified impact is provided below. The whole project assessment and CEA for MHPGC Project is presented in **Table 8.18** to **Table 8.41**. It is noted that no secondary mitigation has been identified since all impacts are assessed to be ALARP and not significant in EIA terms. Therefore, the residual effects are analogous to the significance of effect identified.

8.10.2 Increased vessel to vessel collision risk (MHPGC Project vessel to third-party)

- 8.10.2.1 The increased vessel to vessel collision risk associated with the MHPGC Project may be further increased by the presence of other projects and plans, should additional vessels be displaced into the MHPGC Project PEIR Red Line Boundary, as this may lead to more vessels being exposed to collision risk with MHPGC Project vessels.
- 8.10.2.2 As vessels may be displaced by either new surface developments such as offshore wind farms, or by the presence of project vessels associated with other developments, all cumulative developments are screened in for this impact.
- 8.10.2.3 The summary of the whole project assessment, Morven Programme assessment and CEA for increased vessel to vessel collision risk (MHPGC Project vessel to third-party) are presented in **Table 8.18**, **Table 8.19** and **Table 8.20**, respectively.

Table 8.18: Whole project assessment for increased vessel to vessel collision risk (MHPGC Project vessel to third-party)

Whole project assessment	
Scenario 1: MHPGC Project and Morven North	
Scenario 2: MHPGC Project and Morven South	
Construction phase	
Assessment of effect	The presence of Morven North or Morven South may lead to changed traffic patterns in the north of the Shipping and Navigation Study Area. Given the MHPGC Project PEIR Red Line Boundary includes the Morven North and Morven South areas, the presence of either or both arrays may displace vessels away from the MHPGC Project PEIR Red Line Boundary, or lead to them crossing in different locations. Therefore, sea room to avoid collision scenarios in the north of the Shipping and Navigation Study Area may be reduced compared with the MHPGC Project alone. Given the location of Morven North and Morven South, the change in traffic is only relevant to Scottish waters and the northernmost extent of the MHPGC Project in English waters in proximity to Morven North and Morven South. Sea room in this area is still expected to be sufficient to avoid close encounters and potential collision scenarios. Adequate promulgation of information is expected to allow vessels to conduct passage planning and avoid ongoing construction works. Therefore, the likelihood of a collision situation is not considered to be materially different from that associated with the MHPGC Project alone, and in particular remains more likely in English waters where the offshore export cable corridor passes through busier areas of shipping and is subject to greater navigational constraints. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be extremely unlikely. In English waters, the frequency of occurrence is considered to be remote.
Severity of consequence	As per Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation, which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per the construction phase, the presence of Morven North or Morven South may alter traffic patterns but is not expected to lead to a change in the impact of vessel to vessel collision risk beyond that assessed in the MHPGC Project alone assessment, as presented in Section 8.8.3. It is noted that fewer vessels will be involved in project activities during the O&M phase when compared to the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.
Frequency of occurrence	The frequency of occurrence in both Scottish and English waters is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be moderate for both Scottish and English waters.

Whole project assessment	
Scenario 1: MHPGC Project and Morven North	
Scenario 2: MHPGC Project and Morven South	
Significance of effect	In both Scottish and English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be extremely unlikely . In English waters, the frequency of occurrence is considered to be remote .
Severity of consequence	As per the construction phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.

Table 8.19: Morven Programme assessment for increased vessel to vessel collision risk (MHPGC Project vessel to third-party)

Morven Programme assessment	
Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)	
Construction phase	
Assessment of effect	The presence of both Morven North and Morven South would have a similar effect on increased collision risk as either of the two in isolation. Additionally, the presence of the MBAGC Project is not anticipated to influence the collision risk noting the low associated data confidence. Therefore, the significance of the effect is as per the whole project assessment outlined in Table 8.18 . This includes the assertion that the likelihood of a collision situation arising is greater in English waters given the offshore export cable corridor passes through busier areas of shipping and is subject to greater navigational constraints. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be extremely unlikely . In English waters, the frequency of occurrence is considered to be remote .

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Severity of consequence	As per Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per the construction phase, the presence of both Morven North and Morven South would have a similar effect on increased collision risk as either of the two in isolation. Therefore, the significance of the effect is as per the whole project assessment outlined in Table 8.18 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	The frequency of occurrence in both Scottish and English waters is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be moderate .
Significance of effect	In both Scottish and English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be extremely unlikely . In English waters, the frequency of occurrence is considered to be remote .
Severity of consequence	As per the construction phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.

Table 8.20: CEA for increased vessel to vessel collision risk (MHPGC Project vessel to third-party)

CEA	
Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in	
Construction phase	
Assessment of effect	There is potential that vessels displaced by cumulative developments may lead to an increase in collision risk associated with the MHPGC Project due to increased traffic volumes within the MHPGC Project PEIR Red Line Boundary during the construction phase. In particular, the Ossian, Bowdun, Morven North and Morven South offshore wind farms may lead to vessel traffic being displaced into a route inshore of Morven North and Morven South in Scottish waters, with vessels likely to pass between Morven North and Morven South and the Seagreen and Berwick Bank offshore wind farms. This may also move the crossings of the MHPGC Project PEIR Red Line Boundary by these displaced vessels from Scottish waters further south into English waters. It is noted that the navigable area left between these wind farm projects has a minimum width of approximately 13nm, which should allow sufficient room for vessels to avoid close encounters and potential collision scenarios. Appropriate promulgation of information should also allow vessels to conduct passage planning and be aware of the need to avoid ongoing construction works. Vessels may be further displaced, particularly within English waters, if there is concurrent construction or maintenance work ongoing on the Berwick Bank Cambois Connection, EGL1, EGL2 and EGL4 cables. However, displacement of vessels associated with these would likely be localised and short-term. As above, if any concurrent works do take place, promulgation of information and the coordination of works to ensure sensitive areas are not heavily impacted are expected to be sufficient mitigation. Accordingly, the mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is extremely unlikely. In English waters, the frequency of occurrence is considered to be remote.
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation, which is not significant in EIA terms.
O&M phase	
Assessment of effect	As noted in the construction phase, the presence of cumulative developments will lead to changes in the vessel traffic routeing in proximity to the MHPGC Project PEIR Red Line Boundary, and may increase vessel density in some locations. If O&M activities associated with the MHPGC Project are taking place in these areas, there may be more vessels exposed to collision risk than in the MHPGC Project assessment. However, the change in vessel numbers is not expected to be great enough that the significance of the risk exceeds that considered in the MHPGC Project assessment as presented in Section 8.8.3. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Frequency of occurrence	The frequency of occurrence in both Scottish and English waters is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be moderate .
Significance of effect	In both Scottish and English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be extremely unlikely . In English waters, the frequency of occurrence is considered to be remote .
Severity of consequence	As per the construction phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.

8.10.3 Increased vessel to vessel collision risk (third-party to third-party)

- 8.10.3.1 The increased vessel to vessel collision risk associated with the MHPGC Project may be further increased by the presence of other projects and plans, should additional vessels be displaced into the MHPGC Project PEIR Red Line Boundary, as this may lead to increased vessel encounters and potential collision scenarios between third-party vessels.
- 8.10.3.2 As vessels may be displaced by either new surface developments such as offshore wind farms, or by the presence of project vessels associated with other developments, all cumulative developments are screened in for this impact.
- 8.10.3.3 The summary of the whole project assessment, Morven Programme assessment and CEA for increased vessel to vessel collision risk (third-party to third-party) are presented in **Table 8.21**, **Table 8.22**, and **Table 8.23**, respectively.

Table 8.21: Whole project assessment for increased vessel to vessel collision risk (third-party to third-party)

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Assessment of effect	The presence of Morven North or Morven South within the MHPGC Project PEIR Red Line Boundary may change the traffic patterns within Scottish waters and the northernmost extent of English waters. Given traffic may be displaced away from the MHPGC Project PEIR Red Line Boundary rather than towards it, there is not expected to be an increase in the frequency or severity above that assessed in Section 8.8.2 . In particular, the likelihood of a collision situation remains more likely in English waters where the offshore export cable corridor passes through busier areas of shipping and is subject to greater navigational constraints. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .	
Severity of consequence	As per Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	
O&M phase		
Assessment of effect	As per the construction phase, while Morven North and Morven South may influence vessel routeing, it is not anticipated to change the impact beyond that assessed for the MHPGC Project as presented in Section 8.8.3 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	The frequency of occurrence in both Scottish and English waters is considered to be negligible .	
Severity of consequence	The severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	Overall, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect in both Scottish and English waters is considered to be broadly acceptable , which is not significant in EIA terms.	
Decommissioning phase		
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .	
Severity of consequence	As per the construction phase, the severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	

Table 8.22: Morven Programme assessment for increased vessel to vessel collision risk (third-party to third-party)

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Construction phase	
Assessment of effect	As per Table 8.21 , while Morven North and Morven South may alter vessel traffic patterns, the increase in vessel to vessel collision risk is not expected to exceed that presented in Section 8.8.2 . Likewise, the presence of the MBAGC Project is not anticipated to influence the collision risk noting the low associated data confidence. In particular, the likelihood of a collision situation remains greater in English waters where the offshore export cable corridor passes through busier areas of shipping and is subject to greater navigational constraints. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
O&M phase	

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Assessment of effect	As per the construction phase, while Morven North and Morven South may influence vessel routeing, it is not anticipated to change the impact beyond that assessed for the MHPGC Project as presented in Section 8.8.3 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	The frequency of occurrence in both Scottish and English waters is considered to be negligible .
Severity of consequence	The severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	Overall, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect in both Scottish and English waters is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the construction phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

Table 8.23: CEA for increased vessel to vessel collision risk (third-party to third-party)

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Construction phase	

CEA	
Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in	
Assessment of effect	Vessel traffic displaced by cumulative developments may increase the vessel density crossing the MHPGC Project PEIR Red Line Boundary in some areas. As noted in Section 8.10.2, this is most likely to be the case where the cumulative effect of Ossian, Bowdun, Berwick Bank, Morven North and Morven South offshore wind farms lead to vessels being displaced into a single route passing between Morven North and Morven South and Seagreen. This increase in vessel density may lead to more vessels subsequently required to re-route around construction works associated with the MHPGC Project, increased encounters and therefore increased potential collision scenarios. As noted in the previous impact, the narrowest point where vessels are expected to be routed through remain 13nm wide, so with appropriate promulgation of information around planned and ongoing works, it is anticipated that vessels will have sufficient time and sea room to safely navigate. Similarly to the previous impact, vessel displacement may also occur as a result of construction or maintenance works associated with the Berwick Bank Cambois Connection, EGL1, EGL2 and EGL4 cables projects, with EGL2 in particular planned to pass between Seagreen and Morven North and Morven South, which may exacerbate the increased collision risk associated with higher vessel densities. Again, it is considered that suitable promulgation of information and coordination between projects should allow vessels to safely navigate. Accordingly, the mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible. In English waters, the frequency of occurrence is considered to be extremely unlikely.
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of risk is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per the construction phase, the potential for re-routed traffic due to cumulative developments may change the high vessel density areas of vessel traffic across the MHPGC Project PEIR Red Line Boundary. Where O&M activities associated with the MHPGC Project take place in these higher density areas, third-party vessels may be further displaced and lead to increased encounters and therefore potential collision scenarios. It is not considered that the changes in routeing will lead to significant enough changes in traffic volumes to increase the third-party collision risk beyond the MHPGC Project alone scenario, particularly given the low frequency of maintenance activities. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	The frequency of occurrence in both Scottish and English waters is considered to be negligible .
Severity of consequence	The severity of consequence is considered to be moderate for both Scottish and English waters.

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Significance of effect	Overall, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect in both Scottish and English waters is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the construction phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

8.10.4 Reduced access to local ports and harbours

- 8.10.4.1 The reduction in port or harbour access may be exacerbated should there be an overlap between the MHPGC Project construction phase and works close to the landfall associated with other developments. The presence of project vessels associated with other projects may also lead to a greater reduction in port access, should they share a base port with the MHPGC Project.
- 8.10.4.2 Given project vessels associated with any cumulative developments may lead to a reduction in port access being exacerbated, all cumulative developments are screened in for this impact. The EGL1 project is of particular interest, given the similar landfall location.
- 8.10.4.3 The summary of the whole project assessment, Morven Programme assessment and CEA for reduced access to local ports and harbours are presented in **Table 8.24**, **Table 8.25** and **Table 8.26**, respectively.

Table 8.24: Whole project assessment for reduced access to local ports and harbours

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Assessment of effect	Given the distance from Morven North or Morven South to any of the ports and harbours considered within MHPGC Project alone assessment in Section 8.8.2 , it is not anticipated that there is any change to the frequency or severity of the impact. In particular, the potential for port access issues is only considered for English waters given the proximity of the Port of Seaham and its approaches. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be reasonably probable .	
Severity of consequence	As per Section 8.8.2 , the severity of consequence is considered to be minor for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.	
Decommissioning phase		
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be reasonably probable .	
Severity of consequence	As per the construction phase, the severity of consequence is considered to be minor for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.	

Table 8.25: Morven Programme assessment for reduced access to local ports and harbours

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Construction phase	
Assessment of effect	As per the whole project assessment presented in Table 8.24 , Morven North and Morven South are not expected to lead to a greater reduction in port access beyond that the MHPGC Project alone assessment in Section 8.8.2 . Likewise, the presence of the MBAGC Project is not anticipated to influence the level of port access noting the low associated data confidence but that the landfall location will be distinct from that associated with the MHPGC Project. In particular, the potential for port access issues is only considered for English waters given the proximity of the Port of Seaham and its approaches. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be reasonably probable .
Severity of consequence	As per Section 8.8.2 , the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible . In English waters, the frequency of occurrence is considered to be reasonably probable .
Severity of consequence	As per the construction phase, the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.

Table 8.26: CEA for reduced access to local ports and harbours

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Construction phase	
Assessment of effect	As noted in the MHPGC Project assessment, reduction in port access is only expected to affect the Port of Seaham, with the potential for this to be exacerbated if there is overlap between construction works close to landfall and works associated with the EGL1 cable project. It is noted that these would be limited to maintenance works given the EGL1 project is expected to be operational at the time of the construction phase. This may create a larger footprint of ongoing works, which would require greater deviations from vessels attempting to access the port. Coordination of works between the projects and in liaison with the Port of Seaham (CoT30), along with suitable promulgation of information on planned and ongoing works, should ensure that vessel access not reduced beyond the findings of the MHPGC Project assessment presented in Section 8.8.2. Other cumulative developments are sufficiently far offshore that reduction in port access due to the cumulative effect of these with the MHPGC Project is considered unlikely, however if projects share base ports, then this may lead to additional vessels which are RAM navigating around ports. It is considered that coordination with the ports and other projects should be sufficient to ensure that MHPGC Project vessel movements do not impede port access. Accordingly, the mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible. In English waters, the frequency of occurrence is considered to be reasonably probable.
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2, the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation, which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, the frequency of occurrence is considered to be negligible. In English waters, the frequency of occurrence is considered to be reasonably probable.

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Severity of consequence	As per the construction phase, the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation, which is not significant in EIA terms.

8.10.5 Disruption to fishing and recreational activities

- 8.10.5.1 Disruption to fishing and recreational activities may be increased by the presence of other projects and plans, or if works associated with these projects are ongoing. Given the consequence of disruption to fishing activities is primarily a commercial issue not directly relating to navigational safety, the risk is assessed fully in **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR**. Similarly, disruption to recreational activities are assessed in **Volume 2, Chapter 10: Infrastructure and Other Sea Users, of the PEIR**. Navigational safety risks to fishing and recreational vessels, such as collision and grounding risk, are considered elsewhere within this risk assessment.

8.10.6 Disruption to third-party marine activities

- 8.10.6.1 Disruption to third-party activities may be increased by the presence of other projects and plans, or if works associated with these projects are ongoing.
- 8.10.6.2 As disruption may be increased by either new surface developments such as offshore wind farms, or by the presence of project vessels associated with other developments, all cumulative developments are screened in for this impact.
- 8.10.6.3 The summary of the whole project assessment, Morven Programme assessment and CEA for disruption to third-party activities are presented in **Table 8.27, Table 8.28 and Table 8.29**, respectively.

Table 8.27: Whole project assessment for disruption to third-party marine activities

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Assessment of effect	The most likely area where third-party marine activities may be disrupted by works associated with the MHPGC Project is at the Nose’s Point spoil ground, located north of the MHPGC Project PEIR Red Line Boundary, at landfall. The presence of Morven North or Morven South is not considered likely to lead to any change in the impact as assessed in Section 8.8.2 for the MHPGC Project alone. In particular, potential for third-party activity disruption is only considered for English waters. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .	
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2 , the severity of consequence is considered to be minor for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	
O&M phase		
Assessment of effect	As noted in the construction phase, the Nose’s Point spoil ground is the most likely location where the MHPGC Project may cause disruption to third-party marine activities. Given the distance from Morven North and Morven South to the spoil ground, it is considered unlikely that there is any change to the impact compared with the MHPGC Project assessment presented in Section 8.8.3 . In particular, potential for third-party activity disruption is only considered for English waters. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .	
Severity of consequence	The severity of consequence is considered to be minor for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Decommissioning phase		
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .	
Severity of consequence	As per the construction phase, the severity of consequence is considered to be minor for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	

Table 8.28: Morven Programme assessment for disruption to third-party marine activities

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Construction phase	
Assessment of effect	As per Table 8.27 , the presence of Morven North and Morven South is not expected to increase disruption to third-party marine activities beyond the MHPGC Project alone assessment presented in Section 8.8.2 . Likewise, the presence of the MBAGC Project is not anticipated to influence the level of disruption to third-party marine activities noting the low associated data confidence. In particular, potential for third-party activity disruption is only considered for English waters. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2 , the severity of consequence is considered to be minor for both Scottish and English waters.

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per Table 8.27, the presence of Morven North and Morven South is not expected to increase disruption to third-party marine activities beyond the MHPGC Project alone assessment presented in Section 8.8.3. In particular, potential for third-party activity disruption is only considered for English waters given the proximity of the Port of Seaham and its approaches. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, is anticipated the frequency of occurrence is negligible. In English waters, the frequency of occurrence is considered to be extremely unlikely.
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible. In English waters, the frequency of occurrence is considered to be remote.
Severity of consequence	As per the construction phase, the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
	In English waters, the frequency of occurrence is remote and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

Table 8.29: CEA for disruption to third-party marine activities

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Construction phase	
Assessment of effect	Dredgers were recorded visiting the Nose's Point spoil ground, located close to the MHPGC Project PEIR Red Line Boundary at landfall. Due to their location, these are not likely to interact with cumulative projects. The dredger recorded on AIS visiting the spoil ground was working on maintenance dredging within the Port of Seaham. Given this is carried out periodically rather than continuously, and the likelihood of this overlapping with both the MHPGC Project construction activities and EGL1 maintenance activities close to the spoil ground, it is not considered likely that the significance of effect is greater than the findings of the MHPGC Project assessment presented in Section 8.8.2 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2 , the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per the construction phase, the proximity of the EGL1 and MHPGC Project PEIR Red Line Boundary in nearshore areas may exacerbate any disruption to third-party marine activities, if there are concurrent activities in similar areas. This is particularly the case in the nearshore areas relating to dredgers operating between Seaham and the Nose's Point spoil ground. However, given the low frequency of O&M activities, as well as the dredging operations themselves, it is anticipated that any overlapping activities can be sufficiently mitigated via promulgation of information and marine coordination. Therefore, the risk of disruption is considered to be as per the MHPGC Project alone assessment as presented in Section 8.8.3 .

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
	Accordingly, the mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore for this impact the significance of effect is considered to be the same as determined for the construction phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .
Severity of consequence	As per the construction phase, the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is minor. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

8.10.7 Reduction in under keel clearance

- 8.10.7.1 There may be increased risk of reduced under keel clearance if additional crossings with other subsea infrastructure are required. The presence of other cumulative projects and plans may also lead to displacement of vessels into the MHPGC Project PEIR Red Line Boundary, leading to a greater number of vessels being exposed to the reduced under keel clearance.
- 8.10.7.2 As vessels may be increased by either new surface developments such as offshore wind farms, or by the presence of project vessels associated with other developments, all cumulative developments are screened in for this impact. Other subsea infrastructure projects may also lead to additional areas of reduced under keel clearance.
- 8.10.7.3 The summary of the whole project assessment, Morven Programme assessment and CEA for the reduction in under keel clearance are presented in **Table 8.30**, **Table 8.31** and **Table 8.32**, respectively.

Table 8.30: Whole project assessment for reduction in under keel clearance

Whole project assessment	
Scenario 1: MHPGC Project and Morven North	
Scenario 2: MHPGC Project and Morven South	
Construction phase	
Assessment of effect	Reduction in under keel clearance is also expected to primarily impact vessels navigating in shallow waters near the landfall. Given the location and water depths surrounding Morven North and Morven South, the impact is considered to be as per the MHPGC Project alone assessment presented in Section 8.8.2 . In particular, potential for reduced under keel clearance is only considered for English waters. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
O&M phase	
Assessment of effect	As noted in the construction phase, under keel clearance reductions are more likely to increase grounding risk where waters are shallow, such as near the landfall. Therefore, Morven North, Morven South or both are not considered to change the frequency or severity of the impact compared with the MHPGC Project alone assessment presented in Section 8.8.3 . In particular, potential for reduced under keel clearance is only considered for English waters. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment in Section 8.8.3 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

Whole project assessment	
Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Decommissioning phase	
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the O&M phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

Table 8.31: Morven Programme assessment for reduction in under keel clearance

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Construction phase	
Assessment of effect	As per Table 8.30 , Morven North and Morven South are not expected to change the severity or frequency of the impact. The MBAGC Project may lead to additional cable crossings, but given the low data confidence, the assessment of the impact is considered not to exceed the MHPGC Project assessment presented in Section 8.8.2 . In particular, potential for reduced under keel clearance is only considered for English waters. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
	In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per the construction phase, the impact is not expected to differ from the MHPGC Project assessment in Section 8.8.3 . In particular, potential for reduced under keel clearance is only considered for English waters.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment in Section 8.8.3 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the O&M phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

Table 8.32: CEA for reduction in under keel clearance

CEA	
Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in	
Construction phase	
Assessment of effect	As noted in the MHPGC Project assessment, there is potential for external cable protection to lead to a reduction in under keel clearance available to vessels, which may increase the risk of grounding incidents. This includes at crossings with other subsea infrastructure such as cables and pipelines. Therefore, if the presence of additional subsea infrastructure requires further crossings, then this will create additional areas of reduced water depth compared with the MHPGC Project alone assessment. Based on available information, up to four crossings (two per trench) may be required to be installed where the EGL2 and EGL4 cables overlap the MHPGC Project PEIR Red Line Boundary (in addition to the 12 crossings associated with existing infrastructure, giving a total of 16 crossings). Crossings with EGL2 and EGL4 are likely to be in water depths in excess of 50m, and are therefore unlikely to reduce water depth to an extent that has an impact on navigation. It is noted that crossings of these cables were considered as part of the MDS considered within Table 8.13. The EGL1 cable route makes landfall north of Seaham before converging with the MHPGC Project PEIR Red Line Boundary approximately 4nm offshore, in water depths of approximately 40m, any depth reduction is not considered likely to impact navigation. It is also noted that the maximum height of crossing protection is the same as the height of external protection elsewhere, and therefore external protection may of equivalent height may have been required in these locations for the MHPGC Project without considering cumulative developments. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible. In English waters, the frequency of occurrence is considered to be extremely unlikely.
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms.
O&M phase	
Assessment of effect	Up to four additional crossings of subsea cables, namely with the EGL2 and EGL4 project, may lead to more areas of reduction in under keel clearance, and therefore a potential increase in grounding risk. As noted for the construction phase, the likely crossing locations, if crossings are required are in sufficient water depth that navigational safety is not affected by the crossings. Therefore, the risk of reduction in under keel clearance remains as per the MHPGC Project alone assessment presented in Section 8.8.3. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible. In English waters, the frequency of occurrence is considered to be extremely unlikely.

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Severity of consequence	As per the MHPGC Project assessment in Section 8.8.3 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the O&M phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

8.10.8 Anchor interaction with subsea cables

- 8.10.8.1 The displacement of third-party vessels into the MHPGC Project PEIR Red Line Boundary may lead to an increased risk of anchor interaction with subsea cables, as this increases the number of vessels which may drop anchor in an emergency while passing through the MHPGC Project PEIR Red Line Boundary. Other plans and projects may also influence the decision of a vessel to drop anchor in certain locations.
- 8.10.8.2 As vessels may be displaced by either new surface developments such as offshore wind farms, or by the presence of project vessels associated with other developments, all cumulative developments are screened in for this impact.
- 8.10.8.3 The summary of the whole project assessment, Morven Programme assessment and CEA anchor interaction with subsea cables are presented in **Table 8.33**, **Table 8.34** and **Table 8.35**, respectively.

Table 8.33: Whole project assessment for anchor interaction with subsea cables

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Assessment of effect	As per the impacts on vessel collision, Morven North and Morven South have the potential to lead to vessel routing changing in Scottish waters and the northernmost extent of the MHPGC Project in English waters. Given Morven North and Morven South are within the MHPGC Project PEIR Red Line Boundary, it is expected that vessel traffic may be displaced out of the MHPGC Project PEIR Red Line Boundary by the wind farm infrastructure, resulting in fewer vessels crossing with the potential to drop anchor. However, vessels may be more likely to drop anchor in an emergency situation due to the presence of Morven North or Morven South, in order to avoid drifting towards the wind farm. Overall, it is not considered that the presence of Morven North or Morven South will change the impact of anchor interaction beyond that assessed in Section 8.8.2 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .	
Severity of consequence	As per Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.	
O&M phase		
Assessment of effect	As per the construction phase, the presence of Morven North, Morven South or both is not expected to change the frequency or severity of anchor interaction beyond that presented in Section 8.8.3 for the MHPGC Project alone. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .	
Severity of consequence	As per Section 8.8.3 , the severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Decommissioning phase		
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely	
Severity of consequence	As per the O&M phase, the severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	

Table 8.34: Morven Programme assessment for anchor interaction with subsea cables

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Construction phase	
Assessment of effect	As per Table 8.33 , the presence of Morven North and Morven South, plus the MBAGC Project are not be expected to change the impact beyond that assessed in Section 8.8.2 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .
Severity of consequence	As per Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
O&M phase	
Assessment of effect	As per the construction phase, the presence of Morven North, Morven South or both is not expected to change the frequency or severity of anchor interaction beyond that presented in Section 8.8.3 for the MHPGC Project alone. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per Section 8.8.3 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the O&M phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

Table 8.35: CEA for anchor interaction with subsea cables

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Construction phase	
Assessment of effect	As per the impacts on vessel collision, it is possible that cumulative developments, particularly the offshore wind farms in Scottish waters displace traffic in such a way that there is an increase in vessels crossing the MHPGC Project PEIR Red Line Boundary, and changes to the locations of these crossings. An increase in vessels crossing the MHPGC Project PEIR Red Line Boundary may lead to an increase in vessels suffering mechanical failures and choosing to drop anchor in an emergency. Given a large number of these vessels would cross the MHPGC Project PEIR Red Line Boundary at some point on their voyage anyway, it is not considered that the overall volume of traffic will substantially change. Within Scottish waters, the presence of additional wind farms may also encourage vessels to drop anchor in emergency situations rather than safely drifting while attempting to resolve mechanical failures. In particular a vessel suffering engine failure in the area between Seagreen and Berwick Bank on the west, and Bowdun, Morven North and Morven South on the east may prefer to drop anchor to avoid drifting towards an offshore wind farm. It is however noted that there is sufficient sea room with no subsea hazards to anchor elsewhere in this area. This may be reduced slightly by the presence of the proposed EGL2 cable passing through the area. However, charting of both the MHPGC Project and the EGL2 are expected to sufficiently inform mariners when deciding to anchor. Based on these factors it is considered that the frequency of occurrence in Scottish waters is increased by the presence of cumulative developments. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is extremely unlikely. In English waters, the frequency of occurrence is considered to be remote.
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation, which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per the construction phase, vessels displaced by cumulative developments may lead to an increase in vessel traffic within the MHPGC Project PEIR Red Line Boundary. Vessels may also be more likely to drop anchor to arrest a drifting situation and avoid potential allisions with wind farm structures, which may lead to a greater risk of anchor interaction with the offshore export cables. Based on these factors it is considered that the frequency of occurrence in Scottish waters is increased by the presence of cumulative developments. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In both Scottish and English waters, it is anticipated the frequency of occurrence is extremely unlikely.

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Severity of consequence	The severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In both Scottish and English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In both Scottish and English waters, it is anticipated the frequency of occurrence is extremely unlikely .
Severity of consequence	The severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In both Scottish and English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

8.10.9 Fishing gear interaction with subsea cables

- 8.10.9.1 If fishing vessels are displaced from current fishing grounds by other projects and plans, this may lead to an increased risk of fishing gear interaction with subsea cables.
- 8.10.9.2 As vessels may be displaced by either new surface developments such as offshore wind farms, or by the presence of project vessels associated with other developments, all cumulative developments are screened in for this impact.
- 8.10.9.3 The summary of the whole project assessment, Morven Programme assessment and CEA for fishing gear interaction with subsea cables are presented in **Table 8.36, Table 8.37 and Table 8.38**, respectively.

Table 8.36: Whole project assessment for fishing gear interaction with subsea cables

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Assessment of effect	As noted in the same impact in Section 8.8.2 , the majority of fishing activity was noted within English waters, particularly in the southern section of the Shipping and Navigation Study Area. Given the location of Morven North and Morven South, it is considered unlikely that the presence of either wind farm leads to a change in the impact compared with the MHPGC Project alone assessment in Section 8.8.2 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .	
Severity of consequence	As per the MHPGC Project assessment in Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.	
O&M phase		
Assessment of effect	As per the construction phase, the presence of Morven North or Morven South is not expected to change the impact of fishing gear interaction beyond the MHPGC Project alone assessment presented in Section 8.8.3 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .	
Severity of consequence	As per the MHPGC Project assessment in Section 8.8.3 , the severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	
Decommissioning phase		

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .	
Severity of consequence	As per the O&M phase, the severity of consequence is considered to be moderate for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.	

Table 8.37: Morven Programme assessment for fishing gear interaction with subsea cables

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Construction phase	
Assessment of effect	The presence of Morven North and Morven South, plus the MBAGC Project, are not expected to lead to increased risk of fishing gear interaction with subsea cables beyond the assessment presented in Section 8.8.2 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be remote .
Severity of consequence	As per the MHPGC Project assessment in Section 8.8.2 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
O&M phase	
Assessment of effect	As per the construction phase, the presence of Morven North and Morven South is not expected to change the impact of fishing gear interaction beyond the MHPGC Project alone assessment presented in Section 8.8.3 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the MHPGC Project assessment in Section 8.8.3 , the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the O&M phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

Table 8.38: CEA for fishing gear interaction with subsea cables

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Construction phase	
Assessment of effect	The presence of cumulative developments may lead to changes in fishing patterns, particularly in the south of the MHPGC Project PEIR Red Line Boundary where the EGL1 cable project may mean that more fishing vessels may fish within the MHPGC Project PEIR Red Line Boundary than recorded in the baseline AIS data. However, promulgation of information regarding the installation of the MHPGC Project, particularly using means targeted towards the fishing industry, will provide fishers with the information to carry out their own informed risk assessment. Therefore, it is not considered that cumulative developments will lead to an increase in the risk of fishing gear interaction with the offshore export cables beyond the findings of the MHPGC Project assessment. It is also possible that offshore wind farms such as Morven North, Morven South and Ossian may displace fishing activity towards the MHPGC Project PEIR Red Line Boundary, however limited fishing was recorded in these areas. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible. In English waters, the frequency of occurrence is considered to be remote.
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.2, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is remote and the severity of consequence is moderate. Therefore, the significance of effect is considered to be tolerable with mitigation, which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per the construction phase, it is not considered that the presence of other cumulative developments will increase the risk of fishing gear interaction beyond the level found in the MHPGC Project assessment presented in Section 8.8.3. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible. In English waters, the frequency of occurrence is considered to be extremely unlikely.
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms.

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
	In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.
Decommissioning phase	
Assessment of effect	If the offshore export cables remain in-situ during the decommissioning phase, the impact is expected to be similar in nature to the O&M phase, and therefore for this impact the significance of effect is considered to be the same as determined for the O&M phase. The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be extremely unlikely .
Severity of consequence	As per the O&M phase, the severity of consequence is considered to be moderate for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms.

8.10.10 Interference with navigation, communications and position-fixing equipment

- 8.10.10.1 The displacement of third-party vessels into the MHPGC Project PEIR Red Line Boundary may lead to an increased risk of interference with navigational equipment such as magnetic compasses, as additional vessels may pass over the MHPGC Project PEIR Red Line Boundary.
- 8.10.10.2 As vessels may be displaced by either new surface developments such as offshore wind farms, or by the presence of project vessels associated with other developments, all cumulative developments are screened in for this impact.
- 8.10.10.3 The summary of the whole project assessment, Morven Programme assessment and CEA for interference with navigation, communications and position-fixing equipment are presented in **Table 8.39**, **Table 8.40** and **Table 8.41**, respectively.

Table 8.39: Whole project assessment for interference with navigation, communications and position-fixing equipment

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Assessment of effect	Interference with navigational equipment due to electromagnetic field effects from the MHPGC Project is most likely to affect vessels close to the landfall in shallow waters. Therefore, Morven North or Morven South is not expected to have any effect on the significance of the impact beyond that presented in Section 8.8.2 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be reasonably probable .	
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be minor for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.	
O&M phase		
Assessment of effect	As per the construction phase, Morven North or Morven South is not expected to have any effect on the significance of the impact beyond that presented in Section 8.8.3 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the whole project assessment.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be frequent .	
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be minor for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is frequent and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.	

Table 8.40: Morven Programme assessment for interference with navigation, communications and position-fixing equipment

	Morven Programme assessment
	Scenario 3: The Morven Programme (Morven North + Morven South + MHPGC Project + MBAGC Project)
Construction phase	
Assessment of effect	As per Table 8.39 , the presence of Morven North and Morven South, plus the MBAGC Project, is not expected to affect vessels closest to the shore, where the electromagnetic field effects are most likely to cause noticeable interference. Therefore, the significance of effect is considered to be as per the MHPGC Project assessment presented in Section 8.8.2 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be reasonably probable .
Severity of consequence	The severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.
O&M phase	
Assessment of effect	As per the construction phase, the presence of Morven North and Morven South is not expected to affect vessels closest to the shore, where the electromagnetic field effects are most likely to cause noticeable interference. Therefore, the significance of effect is considered to be as per the MHPGC Project assessment presented in Section 8.8.3 . The mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the Morven Programme assessment.
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be frequent .
Severity of consequence	The severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is frequent and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.

Table 8.41: CEA for interference with navigation, communications and position-fixing equipment

		CEA
		Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
Construction phase		
Assessment of effect	The presence of additional subsea cables may increase the severity of interference with magnetic compasses due to the combination of electromagnetic fields from cables in close proximity to each other. Due to the water depths at crossings with EGL2 and EGL4, it is not expected that there are significant effects on magnetic compasses at crossings with these cables. A section of the EGL1 cable route runs along a similar route to the MHPGC Project PEIR Red Line Boundary in the approaches to the respective landfalls, which may result in a greater combined electromagnetic field in this area. Given both the EGL1 project and the MHPGC Project will be required to demonstrate adherence to the MCA’s limits on compass deviation, and that even in this nearshore area water depths are approximately 40m, it is not expected that the frequency of occurrence or severity of consequence exceeds that of the MHPGC Project alone. In addition, vessels in coastal areas may use coastal features for navigation, where conditions allow, reducing the likelihood of vessels being solely reliant on magnetic compasses for navigation. Accordingly, the mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible . In English waters, the frequency of occurrence is considered to be reasonably probable .	
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be minor for both Scottish and English waters.	
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable , which is not significant in EIA terms. In English waters, the frequency of occurrence is reasonably probable and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation , which is not significant in EIA terms.	
O&M Phase		
Assessment of effect	The presence of additional subsea cables may increase the severity of interference with magnetic compasses due to the combination of electromagnetic fields from cables in close proximity to each other. Due to the water depths at crossings with EGL2 and EGL4, it is not expected that there are significant effects on magnetic compasses at crossings with these cables. A section of the EGL1 cable route runs along a similar route to the MHPGC Project PEIR Red Line Boundary in the approaches to the respective landfalls, which may result in a greater combined electromagnetic field in this area. Given both the EGL1 project and the MHPGC Project will be required to demonstrate adherence to the MCA’s limits on compass deviation, and that even in this nearshore area water depths are approximately 40m, it is not expected that the frequency of occurrence or severity of consequence exceeds that of the MHPGC Project alone. In addition, vessels in coastal areas may use coastal features for navigation, where conditions allow, reducing the likelihood of vessels being solely reliant on magnetic compasses for navigation. Accordingly, the mitigation measures described for the assessment of this impact for the MHPGC Project alone are also considered relevant for the CEA.	
Frequency of occurrence	In Scottish waters, it is anticipated the frequency of occurrence is negligible .	

	CEA
	Scenario 4: MHPGC Project and Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in
	In English waters, the frequency of occurrence is considered to be frequent .
Severity of consequence	As per the MHPGC Project assessment presented in Section 8.8.3 , the severity of consequence is considered to be minor for both Scottish and English waters.
Significance of effect	In Scottish waters, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of effect is considered to be broadly acceptable, which is not significant in EIA terms. In English waters, the frequency of occurrence is frequent and the severity of consequence is minor. Therefore, the significance of effect is considered to be tolerable with mitigation, which is not significant in EIA terms.

8.10.11 Proposed Monitoring

8.10.11.1 No significant effects were identified for shipping and navigation, therefore no additional mitigations or monitoring measures are required beyond the commitments outlined in **Section 8.7**.

8.11 Transboundary effects

- 8.11.1.1 A screening of transboundary impacts has been carried out and any potential for likely significant transboundary effects with regard to shipping and navigation from the construction, O&M and decommissioning phases of the MHPGC Project upon interests of other states has been assessed as part of the PEIR.
- 8.11.1.2 Given the international nature of vessel routeing (including to international ports such as Rotterdam, Le Havre as well as Norwegian, Icelandic and Faroese ports), all impacts assessed within **Section 8.8** are relevant. In the transboundary screening exercise carried out in **Volume 1, Annex 4.3: Transboundary Screening, of the PEIR**, Denmark, the Netherlands, Norway and Iceland were identified as potentially having transboundary shipping and navigation impacts. Vessels on routes to all of these destinations were recorded within the AIS data presented in **Section 8.4.5**.
- 8.11.1.3 Individual transits may have the potential to be associated with vessels that are internationally owned or located, however, any such transits have been captured within the baseline assessment of vessel traffic as per **Section 8.4**, with further detail provided in **Volume 2, Annex 8.1: Navigational Risk Assessment, of the PEIR**. In particular, AIS is an internationally recognised and implemented means of broadcasting vessel information. As such, no transboundary effects other than those already assessed in **Section 8.8** are anticipated.

8.12 Inter-related effects

- 8.12.1.1 Inter-related effects are the combined impact of multiple aspects of the MHPGC Project on a single receptor. These are as follows:
- **Project lifetime effects:** Assessment of the scope for effects that occur throughout more than one phase of the MHPGC Project (construction, O&M and decommissioning), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three phases.
 - **Receptor led effects:** Assessment of the scope for all effects (including inter-relationships between environmental topics) to interact, spatially and temporally, to create inter-related effects on a receptor.
- 8.12.1.2 Inter-related effects are assessed within **Volume 4, Chapter 5: Inter-related Effects, of the PEIR**.

8.13 Summary

8.13.1 Summary of effects

- 8.13.1.1 This chapter has assessed the potential impacts on shipping and navigation from the construction, O&M and decommissioning phases of the MHPGC Project.
- 8.13.1.2 **Table 8.42** present a summary of impacts and confirms the residual effects for Scottish and English waters.

8.13.2 Summary of secondary mitigation and monitoring

- 8.13.2.1 No significant effects were identified for shipping and navigation, therefore no additional mitigations or monitoring measures are required beyond the within the commitments outlined in **Section 8.7**.

Table 8.42: Summary of potential impacts and residual effects

Impact	Jurisdiction	Frequency of occurrence	Severity of consequence	Significance of effect	Secondary mitigation and monitoring	Residual effect
Construction phase						
Increased vessel to vessel collision risk (MHPGC Project vessel to third-party)	Scotland	Extremely unlikely	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Remote	Moderate	Tolerable with mitigation		Tolerable with mitigation
Increased vessel to vessel collision risk (third-party to third-party)	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Moderate	Broadly acceptable		Broadly acceptable
Reduced access to local ports and harbours	Scotland	Negligible	Minor	Broadly acceptable	N/A	Broadly acceptable
	England	Reasonably probable	Minor	Tolerable with mitigation		Tolerable with mitigation
Disruption to third-party marine activities	Scotland	Negligible	Minor	Broadly acceptable	N/A	Broadly acceptable
	England	Remote	Minor	Broadly acceptable		Broadly acceptable
Reduction in under keel clearance	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Moderate	Broadly acceptable		Broadly acceptable
Anchor interaction with subsea cables	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Remote	Moderate	Tolerable with mitigation		Tolerable with mitigation
Fishing gear interaction with subsea cables	Scotland	Negligible	Serious	Broadly acceptable	N/A	Broadly acceptable
	England	Remote	Serious	Tolerable with mitigation		Tolerable with mitigation
Interference with navigation, communication and position-fixing equipment	Scotland	Negligible	Minor	Broadly acceptable	N/A	Broadly acceptable
	England	Reasonably probable	Minor	Tolerable with mitigation		Tolerable with mitigation

Impact	Jurisdiction	Frequency of occurrence	Severity of consequence	Significance of effect	Secondary mitigation and monitoring	Residual effect
O&M phase						
Increased vessel to vessel collision risk (MHPGC Project vessel to third-party)	Scotland	Extremely unlikely	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Moderate	Broadly acceptable		Broadly acceptable
Increased vessel to vessel collision risk (third-party to third-party)	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Negligible	Moderate	Broadly acceptable		Broadly acceptable
Disruption to third-party marine activities	Scotland	Negligible	Minor	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Minor	Broadly acceptable		Broadly acceptable
Reduction in under keel clearance	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Moderate	Broadly acceptable		Broadly acceptable
Anchor interaction with subsea cables	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Moderate	Broadly acceptable		Broadly acceptable
Fishing gear interaction with subsea cables	Scotland	Negligible	Serious	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Serious	Broadly acceptable		Broadly acceptable
Interference with navigation, communications and position-fixing equipment	Scotland	Negligible	Minor	Broadly acceptable	N/A	Broadly acceptable
	England	Frequent	Minor	Tolerable with mitigation	N/A	Tolerable with mitigation
Decommissioning phase						
Increased vessel to vessel collision risk (MHPGC Project vessel to third-party)	Scotland	Extremely unlikely	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Remote	Moderate	Tolerable with mitigation		Tolerable with mitigation
Increased vessel to vessel collision risk (third-party to third-party)	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Moderate	Broadly acceptable	N/A	Broadly acceptable
	Scotland	Negligible	Minor	Broadly acceptable	N/A	Broadly acceptable

Impact	Jurisdiction	Frequency of occurrence	Severity of consequence	Significance of effect	Secondary mitigation and monitoring	Residual effect
Reduced access to local ports and harbours	England	Reasonably probable	Minor	Tolerable with mitigation		Tolerable with mitigation
Disruption to third-party marine activities	Scotland	Negligible	Minor	Broadly acceptable	N/A	Broadly acceptable
	England	Remote	Minor	Broadly acceptable		Broadly acceptable
Reduction in under keel clearance	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Extremely unlikely	Moderate	Broadly acceptable		Broadly acceptable
Anchor interaction with subsea cables	Scotland	Negligible	Moderate	Broadly acceptable	N/A	Broadly acceptable
	England	Remote	Moderate	Tolerable with mitigation		Tolerable with mitigation
Fishing gear interaction with subsea cables	Scotland	Negligible	Serious	Broadly acceptable	N/A	Broadly acceptable
	England	Remote	Serious	Tolerable with mitigation		Tolerable with mitigation

8.14 References

- DESNZ (2025a). Overarching National Policy Statement for Energy (EN-1). London, The Stationery Office. Available at: <https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1-2025> (Accessed: February 2026).
- DESNZ (2025b). National Policy Statement for Renewable Energy Infrastructure (EN-3). London, The Stationery Office. Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3-2025> (Accessed: February 2026).
- DESNZ (2025c). National Policy Statement for Electricity Network Infrastructure (EN-5). London, The Stationery Office. Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5-2025> (Accessed: February 2026).
- FLOWW (2025). *Best Practice Guidance for Fisheries Liaison with Offshore Renewables Developments*. Available at: <https://www.datocms-assets.com/136653/1764233603-floww-best-practice-guidance-nov25-update.pdf> (Accessed: July 2026).
- HM Government (2011a). UK Marine Policy Statement. London, The Stationery Office. Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-ports> (Accessed: February 2026)
- HM Government (2021). North East Inshore and North East Offshore Marine Plan. London, Department for Environment, Food and Rural Affairs (DEFRA). Available at: <https://assets.publishing.service.gov.uk/media/5a7ec0eced915d74e33f2342/east-plan.pdf> (Accessed: February 2026).
- HM Government (2024). The United Kingdom National Contingency Plan for Responding to Marine Pollution Incidents. London, The Stationary Office. Available at: <https://www.gov.uk/government/publications/national-contingency-planncp>
- IEMA (2015). Environmental Impact Assessment Guide to: Delivering Quality Development. Lincoln, IEMA.
- IMO (1972/77). Convention on the International Regulations for Preventing Collisions at Sea 1972 (COLREGS). London, IMO.
- IMO (1974). International Convention for the Safety of Life at Sea (SOLAS). London, IMO. <https://www.imo.org/en/knowledgecentre/conferencesmeetings/pages/solas.aspx> (Accessed: February 2026).
- IMO (2018). Revised Guidelines for Formal Safety Assessment (FSA) For Use in the IMO Rule-Making Process. MSC-MEPC.2/Circ.12/Rev.2. London, IMO. Available at: <https://www.imo.org/en/ourwork/safety/pages/formalsafetyassessment.aspx> (Accessed: February 2026).
- Marine Directorate – Licencing Operations Team (2025). Scoping Opinion - Morven Offshore Wind Farm, Hawthorn Pit Grid Connection. Aberdeen, MD-LOT.
- MCA (2021a). Marine Guidance Note 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response. Southampton, MCA. Available at: <https://www.gov.uk/government/publications/mgn-654-mf-offshore-renewable-energy-installations-orei-safety-response> (Accessed: February 2026).

MCA (2021b). MGN 661 (Merchant and Fishing) Navigation – Safe and Responsible Anchoring and Fishing Practices. Southampton, MCA. Available at: <https://www.gov.uk/government/publications/mgn-661-mf-navigation-safe-and-responsible-anchoring-and-fishing-practices> (Accessed: February 2026).

MMO (2025). Scoping request under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 for the proposed Morven Offshore Windfarm Transmission Assets Project by Morven Offshore Wind Limited. DCO/2025/00005. Newcastle upon Tyne, MMO.

PINS (2025a). Scoping Opinion: Proposed Morven Hawthorn Pit Grid Connection Project - EN0210005. Slough, PINS.

PINS (2025b). Immingham Green Energy Terminal. Available at: <https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/TR030008> (Accessed: November 2025).

Port of Sunderland. (2025). Work Completes on Multi-Million Pound Port Expansion. Available at: <https://portofsunderland.org.uk/news/work-completes-multi-million-pound-port-expansion/> (Accessed: November 2025).

RPS (2025). Morven Hawthorn Pit Grid Connection Project Environmental Impact Assessment Scoping Report.

RYA (2019). *The RYA's position on offshore renewable energy developments. Paper 1 (of 4) – Wind Energy June 2019*. Available at: <https://www.rya.org.uk/environment-and-sustainability/guidance-notes/> (Accessed June 2026).

Scottish Government (2015). Scotland's National Marine Plan. Edinburgh, Scottish Government. Available at: <https://www.gov.scot/publications/scotlands-national-marine-plan/> (Accessed: February 2026).

UKHO (2021). Admiralty Sailing Directions, North Sea (West) Pilot NP54, 12th Edition. Taunton, UKHO.

UK Government (1885). Submarine Telegraph Act 1885. London, The Stationery Office.

UNCLOS (1982). United Nations Convention on the Law of the Sea. Montego Bay, UN.