

Morven Offshore Wind Farm

Morven Hawthorn Pit Grid Connection Project

Preliminary Environmental Information Report

Volume 2, Annex 8.1: Navigational Risk Assessment

MVCNS-J4029-ATC-00002
October 2026
B01

anatec

Document status

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

Prepared by:

Anatec

Prepared for:

Morven Offshore Wind Limited

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Glossary of Terms

Term	Definition
Advisory safe passing distance	Advisory safe passing distance to discourage vessels from passing close to sensitive activities such as the laying of cable.
Automatic Identification System (AIS)	A system by which vessels automatically broadcast their identity, key statistics including location, destination, length, speed and current status. Most commercial vessels and European Union fishing vessels over 15 metre (m) in length are required to carry AIS.
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.
Cumulative effect	Likely significant effects resulting from the MHPGC Project assessed together with effects from one or more different projects and plans on the same receptor/resource.
Cumulative effects assessment	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.
Decommissioning	The period during which a development and its associated processes are removed from active operation.
Electromagnetic Field (EMF)	An electric and magnetic force field that surrounds a moving electrical charge.
Embedded mitigation measure	Embedded mitigation includes both primary and tertiary mitigation measures.
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 Organization (IMO).
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 inclusive of all construction works.
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.
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).

Term	Definition
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 a 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 ('MBAGC Project')	An additional proposed grid connection for Morven North and Morven South, comprised of an export cable and onshore land substation. This is not part of the applications for the MHPGC 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 ('MHPGC Project')	The MHPGC Project is comprised of the offshore export cable in Scottish and English waters from the Morven North or the Morven South offshore substation platforms (OSP(s)), the onshore export cable in England and the onshore land substation (LSS) in England. Also referred to in this report as the MHPGC Project, for ease of reading.
Morven North Offshore Wind Array Project ('Morven North') Morven North Offshore Wind Array Project (hereafter 'Morven North')	The Morven North Offshore Wind Array Project entirely in Scottish waters, which includes the wind turbines and foundations, OSP(s) and foundations, inter-array and inter-connector 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 entirely in Scottish waters, which includes the wind turbines and foundations, OSPs and foundations, inter-array and inter-connector cables and associated infrastructure located within the Morven South Boundary.
Navigational Risk Assessment (NRA)	A document which is required by the MCA under MGN 654 which assesses the hazards to Shipping and Navigation users of the MHPGC Project based upon Formal Safety Assessment (FSA).
Offshore export cable corridor	The proposed offshore area in which the offshore export cables will be laid, from either the Morven North OSP or Morven OSP to the transition joint bay (TJB) at landfall.

Term	Definition
Offshore export cables	HVDC cables which bring electricity from either the Morven North or Morven South offshore substation platform to the TJB at landfall.
the Study Area	For each environmental topic, the baseline environment will be characterised, and the potential environmental impacts 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 potential impacts of the MHPGC Project may be experienced by the relevant receptors (i.e. Zone of Influence). For Shipping and Navigation, the Study Area is defined as a five nautical mile buffer from the offshore extent of the MHPGC Project PEIR Red Line Boundary seaward of MHWS.
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 Table

Abbreviation	Definition
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
AtoN	Aid to Navigation
CBRA	Cable Burial Risk Assessment
CD	Chart Datum
Cefas	Centre for Environment Fisheries and Aquaculture Science
CFLO	Company Fisheries Liaison Office
CLB	Cable Lay Barge
CLV	Cable Lay Vessel
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
CSIP	Cable Specification and Installation Plan
CTV	Crew Transfer Vessel
DfT	Department for Transport

Abbreviation	Definition
EGL	Eastern Green Link
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
ERCoP	Emergency Response Co-operation Plan
ES	Environmental Statement
ESRI	Environmental Systems Research Institute
ETRS89	European Terrestrial Reference System 1989
EU	European Union
FLO	Fisheries Liaison Officer
FLOWW	Fishing Liaison with Offshore Wind and Wet Renewables Group
FPSO	Floating Production Storage Offloading
FSA	Formal Safety Assessment
GIS	Geographic Information System
GLA	General Lighthouse Authority
GT	Gross Tonnage
HDD	Horizontal Directional Drilling
HMCG	His Majesty's Coastguard
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
ICES	International Council for the Exploration of the Sea
IMO	International Maritime Organization
JRCC	Joint Resue Coordination Centre
LAT	Lowest Astronomical Tide
LOA	Length Overall
LPG	Liquefied Petroleum Gas
MAIB	Marine Accident Investigation Branch
MBAGC	Morven Branxton Area Grid Connection
MCA	Maritime and Coastguard Agency
MD-LOT	Marine Directorate – Licensing Operations Team
MDS	Maximum Design Scenario
MEAC	Marine Emergency Action Card
MGN	Marine Guidance Note
MHPGC	Morven Hawthorn Pit Grid Connection
MHWS	Mean High Water Springs

Abbreviation	Definition
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MPCP	Marine Pollution Contingency Plan
MRCC	Marine Rescue Coordination Centre
MvOWL	Morven Offshore Wind Limited
NLB	Northern Lighthouse Board
NRA	Navigational Risk Assessment
NSP	Navigational Safety Plan
O&M	Operations and Maintenance
OEMP	Offshore Environmental Management Plan
OREI	Offshore Renewable Energy Installation
OWF	Offshore wind farm
PDE	Project Design Envelope
PEIR	Preliminary Environmental Impact Report
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
SOLAS	International Convention for the Safety of Life at Sea
SoS	Secretary of State
SOV	Service Operation Vessel
TCE	The Crown Estate
TCES	The Crown Estate Scotland
TJB	Transition Joint Bay
UK	United Kingdom
UKHO	UK Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
USV	Unmanned Survey Vessel
UXO	Unexploded Ordnance
VMS	Vessel Monitoring System

Abbreviation	Definition
VTMP	Vessel Traffic Management Plan
VTS	Vessel Traffic Service

Table of Units

Unit	Definition
km	Kilometre
m	Metre
nm	Nautical mile

Executive Summary

The Navigational Risk Assessment (NRA) presents an assessment of hazards associated with the Morven Hawthorn Pit Grid Connection Project (hereafter 'MHPGC Project') Preliminary Environmental Information Report (PEIR) Red Line Boundary relating to shipping and navigation, based on baseline analysis, expert opinion and feedback received through consultation. Hazards have been identified and assessed for the construction, operation and maintenance (O&M) and decommissioning phases, in line with the International Maritime Organization's (IMO) Formal Safety Assessment (FSA) process.

The NRA includes an overview of the shipping and navigation baseline in terms of navigational features and vessel traffic data, as well as a review of potential changes to the environment over the MHPGC Project lifetime. Feedback gathered through consultation is also presented, including Scoping responses and targeted consultation carried out as part of the NRA process.

The NRA presents a risk assessment of the hazards to shipping and navigation users as a result of the MHPGC Project. The significance of all hazards has been assessed to be either broadly acceptable or tolerable with mitigation, with all hazards assessed to be As Low as Reasonably Practicable (ALARP), assuming embedded mitigation measures are implemented.

A cumulative risk assessment was also carried out, finding that the significance of all hazards remained broadly acceptable or tolerable with mitigation.

Following the publication of the PEIR, the NRA will be reviewed based on any feedback received and further consultation will be carried out if required. All received feedback will be incorporated into a finalised NRA and Environmental Statement (ES) chapter as part of the Development Consent Order (DCO) and Marine Licence applications.

1 Introduction

1.1 Background

1. Anatec Ltd were commissioned by GoBe on behalf of Morven Offshore Wind Farm Limited (MvOWL) (hereafter 'the Applicant') to undertake a Navigational Risk Assessment (NRA) for the Morven Hawthorn Pit Grid Connection Project (hereafter 'MHPGC Project').

2. This NRA presents information on the MHPGC Project relevant to existing and estimated future navigational activity and forms the technical appendix to **Volume 2, Chapter 8: Shipping and Navigation, of the Preliminary Environmental Information Report (PEIR)**.

1.2 Objectives of the Navigational Risk Assessment

3. An NRA is an important component of the Environmental Impact Assessment (EIA) process which identifies and assesses the environmental effects of a project, both positive and negative, from a shipping and navigation perspective. The NRA methodology follows the Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 (MCA, 2021a) taking into consideration that the MHPGC Project consists of subsea cables and associated protection only, and there is no surface infrastructure. This NRA includes:

   - Overview of NRA methodology;
   - Summary of consultation undertaken with shipping and navigation stakeholders to date;
   - Lessons learnt from previous offshore wind farm and subsea cable projects;
   - Summary of the project description relevant to shipping and navigation;
   - Summary of relevant guidance and legislation that informs the NRA;
   - Baseline characterisation of the existing environment;
   - Future case vessel traffic characterisation;
   - Assessment of navigational risk (following the Formal Safety Assessment (FSA) process) both for the MHPGC Project alone, the whole Morven Programme and cumulatively with other projects and plans;
   - Outline of embedded and additional mitigation measures;
   - Completion of the MGN 654 Checklist.

4. Potential hazards are considered for each phase of the development as follows:

   - Construction/installation;
   - Operations and maintenance (O&M);
   - Decommissioning.

5. The assessment of the MHPGC Project is based on a parameter-based Project Design Envelope (PDE) approach, in accordance with industry best practice. This approach

allows for a project to be assessed on the basis of maximum project design parameters (i.e., the worst-case scenario) and includes conservative assumptions to form a Maximum Design Scenario (MDS), which is considered and assessed for all hazards.

6. The shipping and navigation baseline and risk assessment has been undertaken based upon the information available and consultation responses received at the time of preparation.

2 MHPGC Project overview

7. This section describes the MHPGC Project in relation to shipping and navigation. Full details of the PDE are presented in **Volume 1, Chapter 2: Project Description, of the PEIR**.

2.1 MHPGC Project location

8. The offshore export cable corridor connects the offshore substation platform (OSP) in either Morven North Offshore Wind Array Project or Morven South Offshore Wind Array Project (hereafter 'Morven North or Morven South') to onshore export cables at a transition joint bay (TJB), with a landfall south of Seaham, on the north-east coast of England. The offshore export cable corridor is contained within the MHPGC Project PEIR Red Line Boundary, which comprises the area in which works would take place and infrastructure installed.

2.2 Details of works

2.2.1 Project design

9. **Table 2.1** presents the maximum design scenario associated with the MHPGC Project.

Table 2.1: Maximum design scenario

Parameter	Maximum design
Number of cables	Up to 2 power conductors Up to 2 fibre optic cables
Length of offshore export cable (OSP to MHWS) (per cable)	Up to 176 nautical miles (nm) (326 kilometres (km)), consisting of up to 52nm (98km) in Scottish waters and up to 123nm (228km) in English waters.
Length of offshore export cable (OSP to exit pit) (per cable)	Up to 175nm (324.67km consisting of up to 52nm (98km) in Scottish waters and up to 123nm (226.67km) in English waters.
Number of trenches	Up to two
Number of trenchless drill exit pits	Up to four located between 360m and 1,660m from Mean Low Water Springs (MLWS) in water depths of a minimum of 4m below LAT
Maximum trench separation	50m
Minimum burial depth (as informed by the **Volume 2, Annex 8.2: Cable Burial Risk Assessment, of the PEIR**)	0.5m (where burial is feasible)
External protection methods	Concrete mattresses, rock bags, rock installation or cable protection systems
Maximum height of external protection	Up to 2m

Parameter	Maximum design
	0.35m above the seabed at exit pits at the landfall, with the intention to restore to seabed level
Percentage of route requiring cable protection from OSP to exit pit	Up to 10.69%
Number of crossings with existing and planned infrastructure	Up to 16
Maximum height of protection at crossings	2m
Offshore export cable type	High Voltage Direct Current (HVDC)
Maximum magnetic field strength	440µT

2.2.2 Construction phase

10. The construction phase is anticipated to last up to four years, noting that construction activities will not be continuous throughout the full period. Construction will comprise a number of route preparation activities, cable installation and installation of protection measures. Works at the landfall location, where the offshore export cables connect to the onshore export cables via a TJB, will also be required.

2.2.2.1 Pre-Installation Activities

11. Prior to installing the offshore export cables, route preparation works will be required. This may include geophysical surveys, sandwave clearance, pre-lay grapnel runs (PLGR), boulder/debris clearance, works relating to unexploded ordnance (UXO), seabed ploughing or pre-lay trenching and the installation of a rock carpet. Sandwave clearance is expected to be required along up to 16% of the offshore export cable corridor (comprised of up to 31km in Scottish waters, 18km in English offshore waters and 4km in English territorial waters). Boulder clearance is expected to be required along up to 19% of the offshore export cable corridor (comprised of up to 31km in Scottish waters, 30km in English offshore waters and 8km in English territorial waters).

2.2.2.2 Cable Laying

12. The cable lay will be undertaken by up to two cable lay vessels (CLV) which will be restricted in their ability to manoeuvre (RAM) due to the nature of the laying operation. Cable installation will take place on a 24/7 basis to reduce the overall installation time and subsequent disruption. Depending on the technique selected as part of the final construction plan, the cable may be unprotected on the seabed following cable lay, prior to burial or protection works being carried out. Guard vessels may be deployed during the construction period to warn other vessels of the ongoing installation, and to protect areas of laid cable prior to protection or burial works.

2.2.2.3 Burial and Protection Works

13. Burial is anticipated to be the primary means of cable protection where feasible, with details of the burial and minimum burial depth of 0.5m identified by the Cable Burial Risk Assessment (CBRA) (see **Volume 2, Annex 8.2: Cable Burial Risk Assessment, of the PEIR**), with external protection applied where this is not possible. External protection may take the shape of rock berms, concrete mattresses, rock bags or cable protection systems. Rock berms are anticipated to lead to the greatest reduction in water depth, with a height of up to 2m above the seabed. External protection is anticipated to be required along up to 10.69% of the full route, with up to 8.32% of this being rock berms, concrete mattresses or rock bags. The remainder will be protected using cable protection systems.

2.2.2.4 Landfall Works

14. The Landfall is located in the vicinity of Blast Beach, south of Seaham. Landfall related works will be undertaken using trenchless techniques. Up to four exit pits are expected to be between approximately 360m and 1,660m offshore and will be located in water depths between 4m and 20m Lowest Astronomical Tide (LAT).

15. Installation of the offshore export cable within the landfall area, including the cable pull-in activity, will require up to 250 vessel movements, with up to 14 vessels on site at any one time, including vessels which may be RAM such as CLVs and a single jack-up vessel.

2.2.2.5 Vessels Required for the Construction Phase

16. **Table 2.2** presents the type and number of vessels required for the construction phase, along with the total number of round trips expected for each vessel type.

Table 2.2: Construction phase vessel numbers

Vessel type	Offshore export cables		Landfall and pull-in works	
	Maximum vessels on site	Total number of round trips	Maximum vessels on site	Total number of round trips
CLV	2	50	2	40
Trenching support vessel	2	40	0	0
Installation support vessel	2	40	2	40
Guard vessel	10	100	2	40
Survey vessel	2	40	0	0
PLGR vessel	1	15	0	0
Out-of-service cable removal vessel	1	5	0	0
Boulder clearance vessel	1	15	0	0

Vessel type	Offshore export cables		Landfall and pull-in works	
	Maximum vessels on site	Total number of round trips	Maximum vessels on site	Total number of round trips
Dredging vessel	1	25	1	30
Crew transport vessel (CTV)	2	100	1	20
Rock dumping vessel	2	50	0	0
Construction support vessel (CSV)	1	10	0	0
Tug anchor handler	4	40	4	60
Cable barge	2	20	1	10
Dive support vessel	0	0	1	10
Total	**33**	**550**	**14**	**250**

17. Additionally, landfall installation jack-up operations will require the following additional vessels: one jack-up vessel, one barge, four barge support tugs, one CSV, and one supply vessel.

2.2.3 Operation and Maintenance phase

18. The operational lifetime of the offshore export cables is anticipated to be 35 years.

19. During the O&M phase, routine vessel movements are expected to be minimal, with up to eight surveys per year undertaken using survey vessels and unmanned survey vessels (USV). During the early years of the O&M phase, it is expected that campaigns will be undertaken more frequently, becoming less frequent as the O&M phase progresses.

20. Remediation and repair activities will be undertaken on a campaign basis as the need for them is identified, with up to 62 vessel trips associated with remediation anticipated to be required each year. Up to 41 repair events are anticipated over the lifetime of the MHPGC Project.

21. The vessel types and numbers anticipated to be involved in the O&M phase over the operational lifetime of the MHPGC Project are detailed in **Table 2.3**.

Table 2.3: O&M phase vessel numbers

O&M Activity	Vessel types required	Maximum Vessels on Site	Indicative Annual Number of Round Trips
Routine inspection (survey vessel)	Survey vessel	2	12
Routine inspection (USV)	USV, guard vessels	5	220

O&M Activity	Vessel types required	Maximum Vessels on Site	Indicative Annual Number of Round Trips
Remediation Activities	CSV, Service Operation Vessel (SOV), guard vessel, rock-dumping vessel, CTV/workboats	4	62
Repair Activities	CLV, jack-up, CSV, CTV, rock-dumping vessel	4	7

2.2.4 Decommissioning phase

22. It is currently proposed that the offshore export cables will be removed where possible and appropriate to do so. However, this approach will be reviewed at the time of decommissioning following the most up to date and best available guidance. Where part or all of the offshore export cables remaining *in situ* is considered the MDS, this has been assumed for the decommissioning phase.

23. In the absence of specific decommissioning details, it is anticipated that decommissioning will involve largely similar processes to the construction phase.

2.3 Maximum Design Scenario

24. The MDS is presented within **Volume 2, Chapter 8: Shipping and Navigation, of the PEIR**.

3 Guidance and legislation

3.1 Legislation

25. The following legislation has been considered in this assessment:

- United Nations Convention on the Law of the Sea (UNCLOS) (UNCLOS, 1982);
- Submarine Telegraph Act (1885) (United Kingdom (UK) Government, 1885);
- International Regulations for Preventing Collisions at Sea (COLREGS) (IMO, 1972/77);
- International Convention for the Safety of Life at Sea (SOLAS) Chapter V Safety of Navigation (IMO, 1974)

3.2 Primary guidance

26. The primary guidance documents used during the assessment are given below:

- MGN 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response and its annexes (MCA, 2021a);
- Revised Guidelines for FSA for use in the IMO Rule-Making Process (IMO, 2018).

27. Although MCA's MGN 654 focuses on offshore renewables, it highlights issues to be taken into consideration when assessing the effects of offshore developments on navigational safety and includes guidance on cable protection and burial within UK waters. It is therefore considered relevant to the MHPGC Project.

28. As required under MGN 654, hazards on shipping and navigation users are assessed using an FSA in line with International Maritime Organization (IMO) guidelines.

3.3 Secondary guidance

29. The secondary guidance document used during the assessment is:

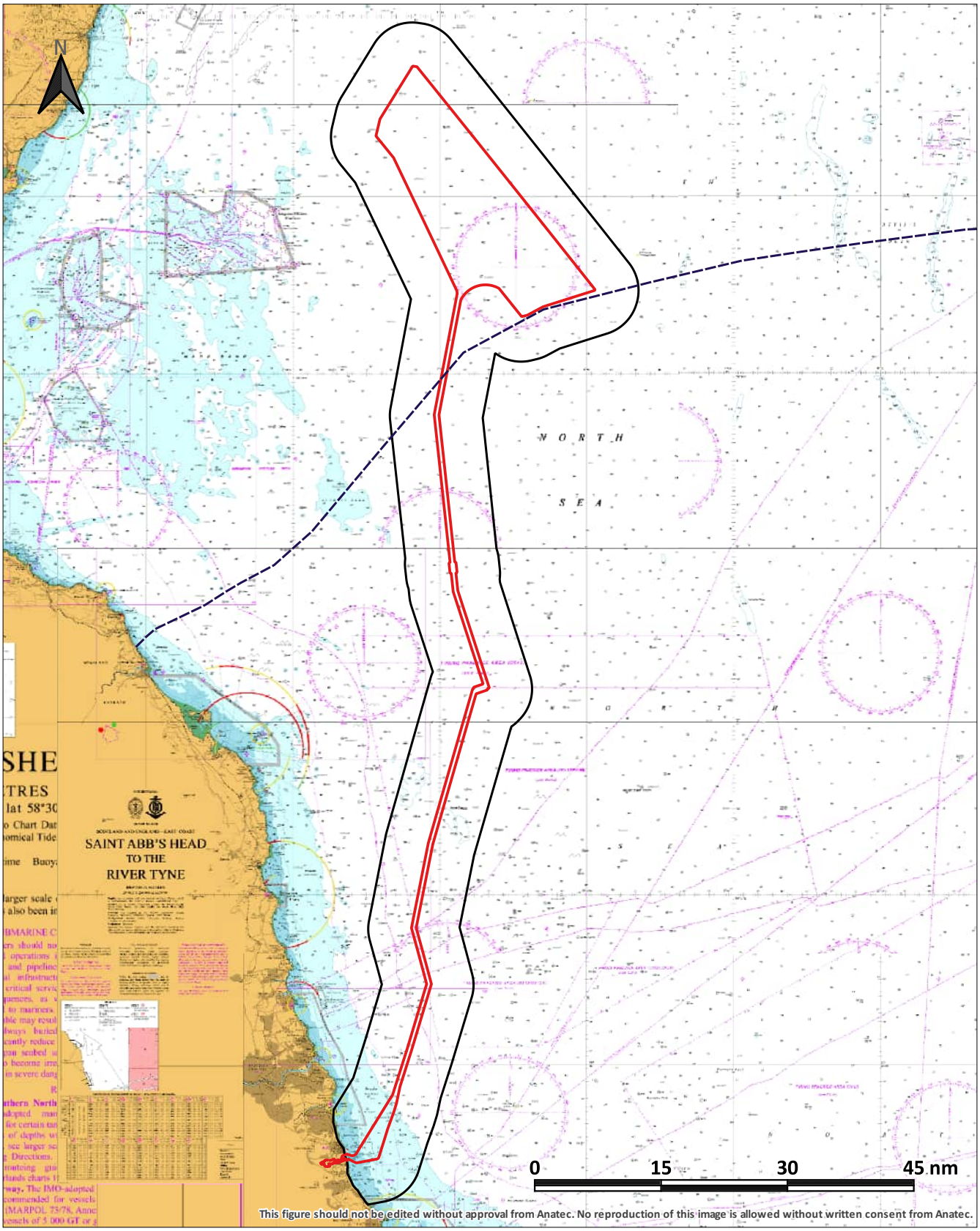
- MGN 661 (Merchant and Fishing) Navigation – Safe and Responsible Anchoring and Fishing Practices (MCA, 2021b).
- RYA Position on Offshore Renewable Energy Developments: Paper 1 (of 4) – Wind Energy (RYA, 2019).
- Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW) Best Practice Guidance for Fisheries Liaison with Offshore Renewables Developments (FLOWW, 2025).

4 Navigational Risk Assessment methodology

4.1 Shipping and Navigation Study Area

30. The Shipping and Navigation Study Area has been defined comprising a minimum 5nm buffer around the MHPGC Project PEIR Red Line Boundary seaward of MHWS. This is considered sufficient to encompass relevant shipping and navigational features which may influence routeing in proximity to the development. Where relevant, features such as ports and harbours outside of the study area have also been considered. The Marine Directorate Licensing and Operations Team (MD-LOT) agreed with the proposed study area in their scoping response [see **Table 5.1**].

31. **Figure 4.1** presents an overview of the Shipping and Navigation Study Area and the MHPGC Project PEIR Red Line Boundary.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 4.1: Overview of the Shipping and Navigation Study Area	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

4.2 Formal Safety Assessment methodology

32. A shipping and navigation user can only be exposed to a risk caused by a hazard if there is a pathway through which a risk can be transmitted between the source activity and the user. In cases where a user is exposed to a risk, the overall significance of risk to the user is determined. This process incorporates a degree of subjectivity.

33. The assessment presented for shipping and navigation users has considered the following factors:

- Baseline data and analysis;
- Expert opinion;
- Lessons learned from previous projects;
- Level of stakeholder concern;
- Number of transits of specific vessels and/or vessel types.

4.3 Formal Safety Assessment process

34. The IMO FSA process approved under the IMO circular MSC-MEPC.2/Circ.12/Rev.2 (IMO, 2018) has been applied within this risk assessment. This is a structured and systematic methodology based on risk analysis and cost benefit analysis (if applicable) to reduce impacts to As Low as Reasonably Practicable (ALARP). There are five basic steps within this process:

- **Step 1** – Identification of hazards (a list of all relevant accident scenarios with potential causes and outcomes);
- **Step 2** – Risk assessment (evaluation of risk factors);
- **Step 3** – Risk control options (devising regulatory measures to control and reduce the identified risks);
- **Step 4** – Cost benefit analysis (determining cost effectiveness of risk control measures);
- **Step 5** – Recommendations for decision-making (information about the hazards, their associated risks and the cost effectiveness of alternative risk control measures).

35. A flow diagram illustrating the FSA methodology is presented in **Figure 4.2**.



Figure 4.2: FSA Process

36. The FSA Process assigns each hazard a "severity of consequence" and "frequency of occurrence" to evaluate the significance during the construction, O&M and decommissioning phases of the MHPGC Project. **Table 4.1** and **Table 4.2** identify how the severity of consequence and the frequency of occurrence has been defined, respectively. The tier levels described in **Table 4.1** are defined within The UK National Contingency Plan for Responding to Marine Pollution Incidents (HM Government, 2024).

Table 4.1: Severity of consequence ranking definitions

Rank	Description	Definition			
		People	Property	Environment	Business
1	Negligible	No perceptible risk	No perceptible risk	No perceptible risk	No perceptible risk
2	Minor	Slight injury(ies)	Minor damage to property, i.e., superficial damage	Tier 1 - local assistance required	Minor reputational risks – limited to users
3	Moderate	Multiple minor or single serious injury	Damage not critical to operations	Tier 2 - limited external assistance required	Local reputational risks

Rank	Description	Definition			
		People	Property	Environment	Business
4	Serious	Multiple serious injuries or single fatality	Damage resulting in critical risk to operations	Tier 2 - regional assistance required	National reputational risks
5	Major	More than one fatality	Total loss of property	Tier 3 - national assistance required	International reputational risks

Table 4.2 Frequency of occurrence ranking definitions

Rank	Description	Definition
1	Negligible	Less than 1 occurrence per 10,000 years
2	Extremely unlikely	1 per 100 to 10,000 years
3	Remote	1 per 10 to 100 years
4	Reasonably probable	1 per 1 to 10 years
5	Frequent	Yearly

37. The severity of consequence and frequency of occurrence are then used to define the significance of risk via a tolerability matrix approach as shown in **Table 4.3**. The significance of risk is defined as Broadly Acceptable (low risk), Tolerable with Mitigation (intermediate risk) or Unacceptable (high risk).

Table 4.3: Tolerability matrix and risk rankings

Severity of consequence							
	Major	5					
	Serious	4					
	Moderate	3					
	Minor	2					
	Negligible	1					
			1	2	3	4	5
			Negligible	Extremely unlikely	Remote	Reasonably probable	Frequent
			Frequency of occurrence				

	Unacceptable (high risk)
	Tolerable with Mitigation (intermediate risk)
	Broadly Acceptable (low risk)

38. Once identified, the significance of risk is assessed to ensure it is ALARP. Further risk control measures may be required to further mitigate a hazard in accordance with the ALARP principles. Unacceptable risks are not considered to be ALARP while Tolerable with Mitigation or Broadly Acceptable risks are considered to be ALARP.

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

4.4 Cumulative Risk Assessment methodology

40. The application of FSA also extends to the review of hazards on a cumulative level. The hazards assessed for the offshore export cable corridor in isolation are again considered but in combination with other plans or projects. A screening exercise is undertaken to identify the relevant plans or projects to include in the cumulative risk assessment and a tiered approach used to ensure all reasonably foreseeable future scenarios are suitably considered.

41. The tiers considered for planned developments are based on status as follows:

- **Tier 1 - highest certainty:**
  - Existing developments either built (operational) or under construction; approved developments awaiting implementation; and permitted applications, but not yet determined, plus Morven North and Morven South.
- **Tier 2 – moderate certainty:**
  - 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 – lowest certainty:**
  - All plans/projects assessed under Tier 1 and 2, plus Morven Branxton Area Grid Connection (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).

42. Only plans or projects located within 10nm of the MHPGC Project PEIR Red Line Boundary are considered in the screening exercise on the basis that beyond this distance there is no clear pathway through which a shipping and navigation user may be affected by the combination of the MHPGC Project and a plan or project.

43. The cumulative risk assessment assesses four distinct scenarios to consider various configuration of the Morven Programme:

- Scenario 1: MHPGC Project and Morven North;
- Scenario 2: MHPGC Project and Morven South;
- Scenario 3: MHPGC Project, Morven North, Morven South and MBAGC Project);
- Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3(including MBAGC Project).

5 Consultation and engagement

5.1 Scoping

44. A Scoping Report for the MHPGC Project was issued to the Planning Inspectorate and MD-LOT in February 2025 (RPS, 2025). Following consultation with the appropriate statutory bodies, PINS (on behalf of the Secretary of State (SoS)) and MD-LOT both provided Scoping Opinions in March 2025 (PINS, 2025; MD-LOT, 2025, respectively). Key comments raised during the scoping process specific to the shipping and navigation NRA are summarised in **Table 5.1**.

45. It is noted that MHPGC Project Scoping Opinions were provided based on the MHPGC Project Scoping Boundary, which has been refined for the PEIR. The MCA provided similar feedback in both the PINS and MD-LOT Scoping Opinions. To avoid repetition, this has only been included once below.

Table 5.1: Summary of responses to consultees from MHPGC Project Scoping responses relevant to shipping and navigation

Consultee	Issue raised	How and where considered in the NRA?	Relevant jurisdiction
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 hazards provided in **Section 11** and has been scoped out of the assessment for the O&M phase.	English waters
	(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 hazards provided in **Section 11** and has been scoped out of the assessment for the O&M phase. Disruption to fishing and recreational activities is assessed fully in V**olume 2, Chapter 7: Commercial Fisheries, of the PEIR** and **Volume 2, Chapter 10: Infrastructure and Other Sea Users, of the PEIR**.	English waters
	(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 hazards provided in **Section 11**.	English waters
	(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 hazards provided in **Section 11**.	English waters
	(Scoping Opinion ID 3.9.5) *During ongoing construction works and prior to being removed entirely during decommissioning (if removal is sought), the*	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 hazards provided in **Section 11**.	English waters

Consultee	Issue raised	How and where considered in the NRA?	Relevant jurisdiction
	presence of infrastructure could result in anchor interaction so this should not be scoped out of the assessment.		
	(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 hazards provided in **Section 11.**	English waters
	(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 hazards provided in **Section 11.** The impact is also scoped in for the construction phase to consider the period when the offshore export cables are energised during testing.	English waters
MD-LOT (March 2025)	(Scoping Opinion ID 5.10.1) Agree with the study area identified in the MHPGC Project Scoping Report.	Noted, and a 5nm buffer around the offshore extent of the MHPGC Project PEIR Red Line Boundary seaward of MHWS has been adopted for the Shipping and Navigation Study Area accordingly.	Scottish waters
	(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.	Scottish waters
MCA	(MCA Scoping Responses) Attention should be paid to vessel routeing 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 15**. Main commercial routes are identified in the baseline analysis in **Section 9**, including those of commercial ferries. In-combination, or inter-related effects are assessed in **Volume 4, Chapter 5: Inter-related Effects, of the PEIR**.	Scottish and English waters

Consultee	Issue raised	How and where considered in the NRA?	Relevant jurisdiction
	(MCA Scoping Responses) A completed MGN checklist should be completed as part of the NRA.	A completed MGN 654 checklist is presented in **Appendix B** of this report.	Scottish and English waters
	(MCA Scoping Responses) As the scope of this report concerns mainly cable laying areas and no fixed structures are planned, then Automatic Identification System (AIS) only data is acceptable on this occasion.	The NRA analyses 12 months of Automatic Identification System (AIS) data in **Section 9** to ensure that any seasonal variations in vessel traffic are sufficiently accounted for.	Scottish and English waters
	(MCA Scoping Responses) 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.	Under keel clearance is assessed in **Section 13**, 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 General Lighthouse Authority (GLA) (Northern Lighthouse Board (NLB) in Scottish waters and Trinity House in English waters) will be required (CoT52) and this is acknowledged in the measures in **Section 12**.	Scottish and English waters
	(MCA Scoping Responses) 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) (as per CoT06), as outlined in **Section 12**.	Scottish and English waters
	(MCA Scoping Responses) 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 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 EMF on ship's compasses. MCA may request for a deviation survey post the cable being laid; this	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 exceed the limits outlined by the MCA. CoT53 states 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.	Scottish and English waters

Consultee	Issue raised	How and where considered in the NRA?	Relevant jurisdiction
	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).	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).. Interference with navigational equipment is considered within the risk assessment presented in **Section 13**.	

5.2 Further consultation and engagement

5.2.1 Stakeholders

46. The following shipping and navigation stakeholders have been consulted as part of the NRA process:

- MCA;
- Trinity House;
- NLB;
- RYA;
- RYA Scotland;
- Cruising Association;
- UK Chamber of Shipping;
- Port of Sunderland;
- PD Ports (Teesport);
- The Port of Seaham;
- DFDS Seaways.

5.2.2 Consultation responses

47. **Table 5.2** presents a summary of the feedback received during consultation with shipping and navigation stakeholders. A virtual meeting was held on 21 November 2025, attended by the MCA, Trinity House, UK Chamber of Shipping, NLB, RYA Scotland and the Port of Seaham. RYA and the Cruising Association were unable to attend this meeting, but were provided with the minutes for comment to ensure full representation of recreational users, as agreed during the meeting with RYA Scotland. Direct consultation with DFDS Seaways and the Port of Sunderland was undertaken via email. Information on the MHPGC Project was also provided to PD Ports (Teesport) via email, with no feedback provided.

Table 5.2: Summary of feedback received in consultation with shipping and navigation stakeholders

Date	Consultee	Point raised	How and where considered in the NRA?	Relevant jurisdiction
05 November 2025 – Email Correspondence	DFDS Seaways	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 13**.	English waters
21 November 2025 – Virtual Meeting	Port of Seaham	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) has been considered as an additional data source to cover fishing activity [see **Section 9.4.4**]. The use of additional data sources	English waters

Date	Consultee	Point raised	How and where considered in the NRA?	Relevant jurisdiction
			such as VMS was presented during consultation. Disruption to fishing activities is considered within the assessment presented in **Section 13**. Assessment of commercial considerations 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 9.5** and is consistent with the feedback given by the Port of Seaham. Anchor interaction is assessed in **Section 13**.	English waters
	RYA Scotland	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 13**, noting that recreational activities are under-represented.	Scottish and English waters
		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 11** presents embedded mitigation, including promulgation of information. This measure includes target information being provided to fishing and recreational bodies, such as Sail Training International.	Scottish and English waters
27 November 2025 – Email Correspondence	Port of Sunderland	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 13**, with navigation warnings included as embedded mitigation (as per CoT04) as noted in Section **12.1.**	English waters
04 December 2025 – Email	MCA	The MCA were content for targeted consultation meetings in place of a hazard workshop,	A hazard log has been prepared and it is included in **Appendix A**.	Scottish and English waters

Date	Consultee	Point raised	How and where considered in the NRA?	Relevant jurisdiction
Correspondence		provided a hazard log is included as part of the NRA.		

6 Data sources

48. The main data sources used to inform the assessment are presented in **Table 6.1**, and described in additional detail in the following subsections.

Table 6.1: Summary of data sources used

Data Source	Period/publication	Coverage
The Crown Estate (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 to 06 December 2024 20 June 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

6.1 AIS data

49. The baseline vessel traffic analysis is primarily based on 12 months of AIS data, recorded between October 2024 and September 2025 and is hereafter referred to as the “data period”. The AIS data was recorded from a combination of onshore, offshore, and satellite receivers to ensure the best possible coverage.

50. As the dataset is AIS only, it assumes that vessels under a legal obligation to broadcast via AIS would do so and assumes that the details broadcast via AIS are accurate (such as vessel type and dimensions) unless there is clear evidence to the contrary.

51. AIS equipment is required to be fitted on all vessels of 300 Gross Tonnage (GT) and upwards engaged on international voyages, cargo vessels of 500GT and upwards not engaged on international voyages, and passenger vessels irrespective of size, built on or after 01 July 2002. Under the Merchant Shipping (Vessel Traffic Monitoring and Reporting Requirements) Regulations 2004 (as amended in 2011), fishing vessels of 15m or more in length overall (LOA), UK registered or operating in UK waters, must be fitted with an approved (Class A) AIS (regulation 8A). In addition, all European Union (EU) registered fishing vessels of length 15m and above are required to carry AIS equipment by EU Directive. Smaller fishing vessels (below 15m) as well as recreational craft are not required to carry AIS, but a proportion do so voluntarily, typically utilising a Class B AIS device. It is also noted that military vessels are not obligated to broadcast on AIS at all times. Therefore, such vessels may be underrepresented within the AIS data.

52. Vessel-based surveys capturing 28 days of AIS, radar and visual observation data (14 days summer and 14 days winter) were carried out for Morven North and Morven South (MvOWL, 2026). The data captured during these surveys has been reviewed as a validation exercise.

6.2 VMS data

53. In addition to AIS data, VMS satellite data has been used to inform on fishing activity within the Shipping and Navigation Study Area. VMS data was provided by MD-LOT for the International Council for the Exploration of the Sea (ICES) rectangles in Scotland for the entirety of 2025. The MMO provides VMS data for a density-based grid for primarily for English waters (noting that there is some limited coverage of Scottish waters), with the latest available year being 2020.

6.3 Helicopter tasking data

54. The DfT provide data on SAR helicopter taskings for the UK. **Section 8.2** presents analysis of this data from April 2015 to March 2025.

6.4 Marine Accident Investigation Branch incident data

55. All UK commercial vessels are required to report accidents to the MAIB. Non-UK vessels do not have to report unless they are in a UK port or are inside the 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. The MAIB will record details of significant accidents of which they are notified by bodies such as His

Majesty's Coastguard (HMCG), or by monitoring news and other information sources for relevant accidents. Data from 2016 to 2025 is reviewed in **Section 8.4**.

6.5 Royal National Lifeboat Institution incident data

56. The RNLI provide data on lifeboat callouts, with data from 2016 to 2025 analysed in **Section 8.3**. It is noted that false alarms and hoaxes are recorded as part of the data, however these have been excluded from the analysis. Any incident to which a RNLI resource was not mobilised has not been accounted for in this dataset.

6.6 United Kingdom Hydrographic Office Admiralty Charts

57. Admiralty Charts, nautical charts issued by the UKHO, have been used to inform navigational features in proximity to the MHPGC Project PEIR Red Line Boundary. The main charts used within the baseline assessment are chart numbers 1191, 1192, 1407, 1409 and 273. The Admiralty Charts are updated periodically and therefore the information shown may not reflect real time features with total accuracy. Consultation input has been sought from relevant stakeholders to ensure the characterisation of navigational features is accurate.

6.7 UKHO Admiralty Sailing Directions

58. Admiralty Sailing Directions are used by mariners to identify established routes when on passage, as well as coastline features, anchorages, ports etc. Admiralty Sailing Directions, North Sea (West) Pilot NP54 12th Edition (UKHO, 2021) has been used in this assessment to identify the key navigational features in the vicinity of the MHPGC Project PEIR Red Line Boundary.

6.8 Spoil grounds

59. Information on spoil grounds has been gathered from Admiralty charts, in addition to the Cefas UK Disposal Site Layer (Cefas, 2023). The layer provides information on areas of UK waters designated for disposal of waste material, including the status, name and location of the site. It is noted that some minor differences between the UK Disposal Site layer and the Admiralty charts were noted due to chart resolution, particularly at the Nose's Point Spoil Ground. In these cases, the UK Disposal Site Layer has been considered as the accurate boundary of the spoil ground, as Cefas are commissioned by the Department for Environment Food and Rural Affairs (Defra) to maintain the layer, and the layer is not dependent on chart scale or detail.

7 Navigational features

60. A plot of the navigational features within and in proximity to the MHPGC Project PEIR Red Line Boundary is presented in **Figure 7.1**, with an overview of those in proximity to the landfall presented in **Figure 7.2**. Each of the features shown are discussed in the following subsections and have been identified using the most detailed UKHO Admiralty Chart available.

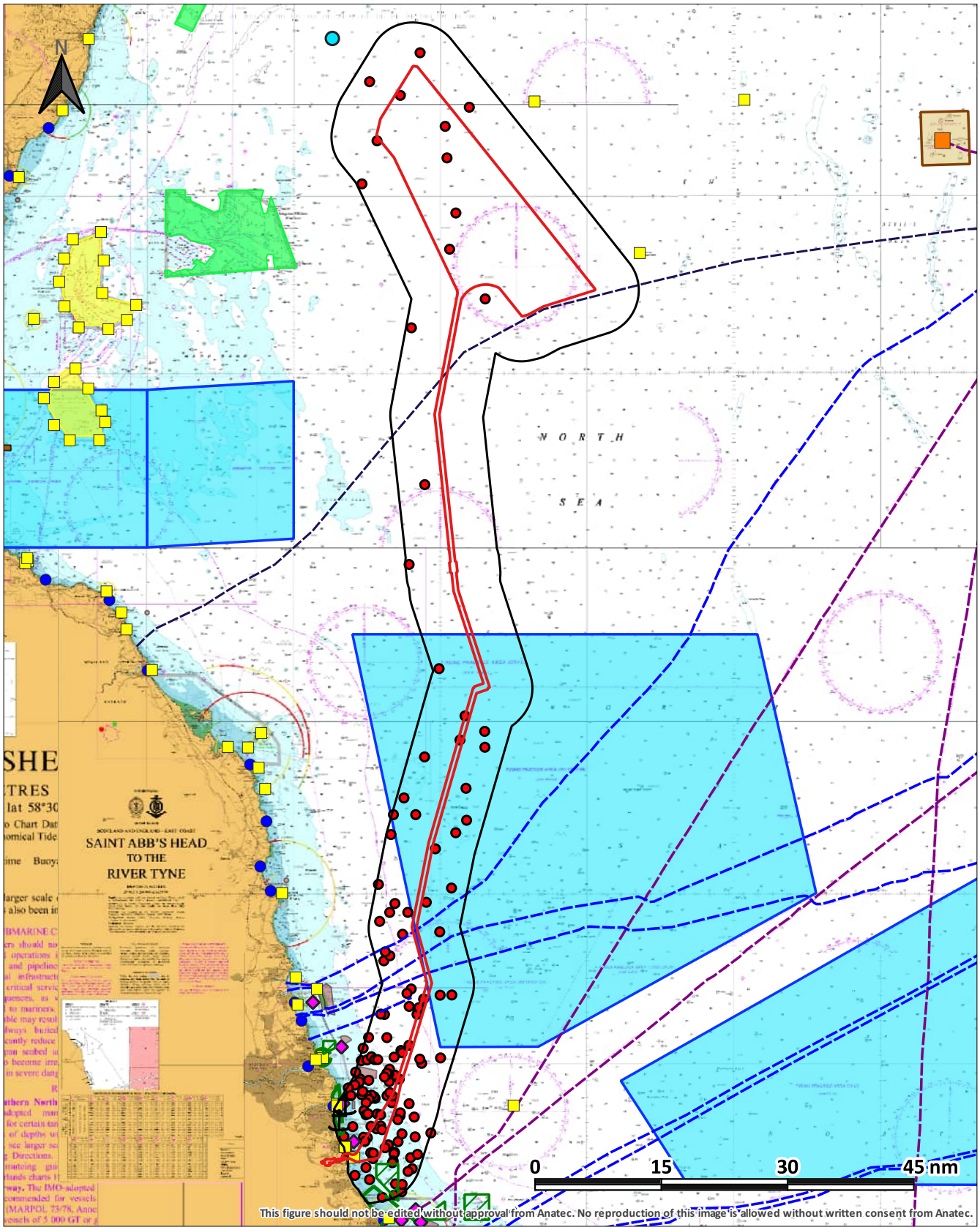
7.1 Ports, harbours and related facilities

61. **Figure 7.3** presents an overview of the main ports and harbours in proximity to the MHPGC Project PEIR Red Line Boundary, in addition to related facilities, such as anchorage areas and pilot boarding stations in both English and Scottish waters.

62. The key ports and harbours of relevance are those close to the landfall located within English waters. Seaham Harbour is the closest of these, with the port limits approximately 250m from the MHPGC Project PEIR Red Line Boundary, all of which is located in English waters. The limits of Port of Sunderland are located approximately 2.5nm to the north of the landfall, while the limits of Teesport is located approximately 3nm to the south; both of which are located in English waters. 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. 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.

63. Pilotage is in operation at Seaham, with the pilot boarding location 1.3nm offshore, approximately 1.0nm west of the MHPGC Project PEIR Red Line Boundary in English waters. 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.

64. 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 in English waters. The Sunderland Marina, located at the entrance to the Port of Sunderland also provides facilities for recreational vessels.



Legend

- MHPGC Project PEIR Red Line Boundary
- English-Scottish Maritime Boundary
- Shipping and Navigation Study Area

Navigational Features

- Aids to Navigation
- Charted Anchorage
- FPSO
- Pilot Boarding Stations
- Ports and Harbours
- Wells
- Wrecks and Obstructions
- Ammunition Dumping Ground (Disused)
- Cables
- Pipelines
- Anchorage Area
- Development Area
- Firing Practice Area
- Port Limits
- Spoil Ground

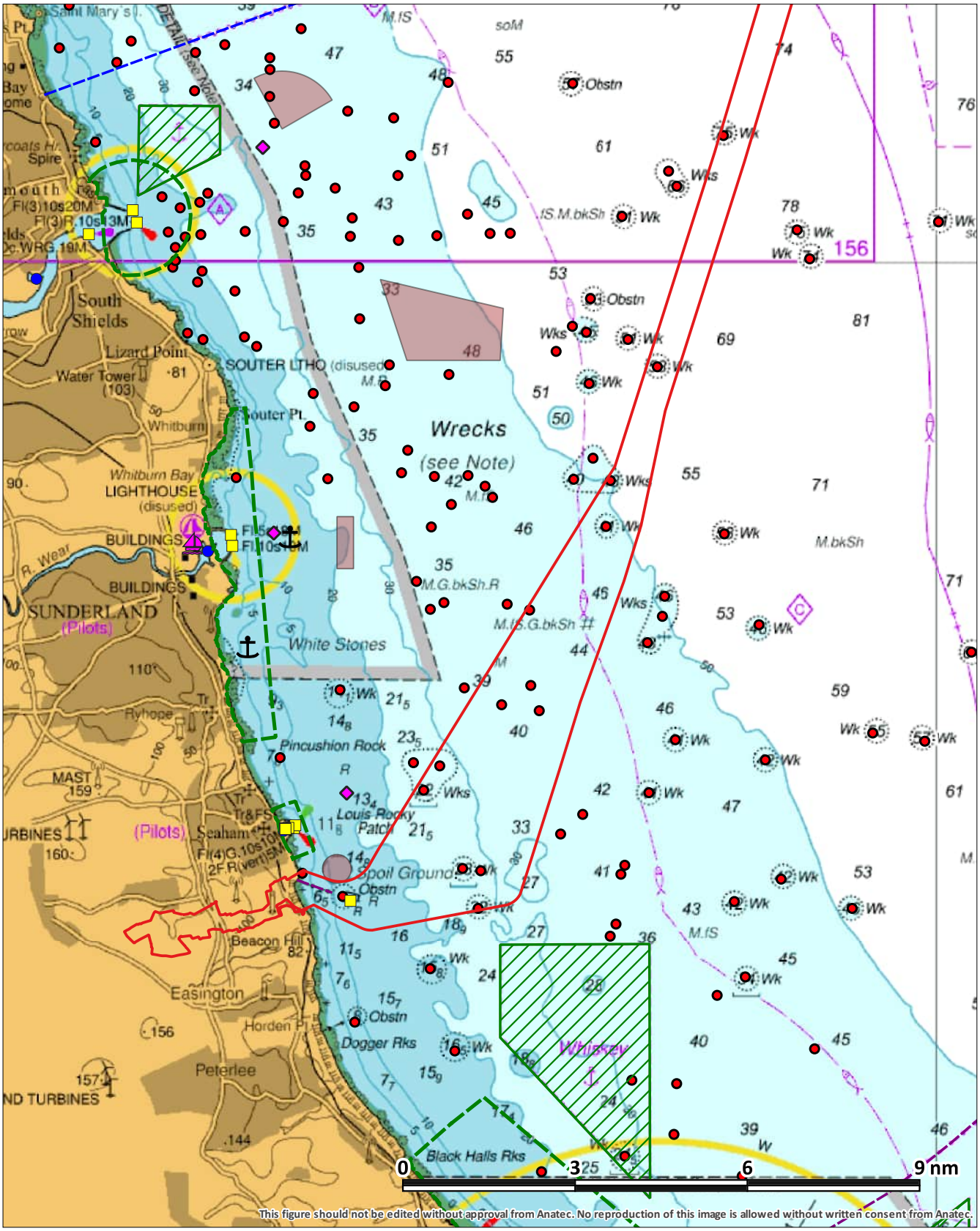
Offshore Wind Farms

- Under Construction
- Operational



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 7.1: Navigational Features	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		



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Legend

- MHPGC Project PEIR Red Line Boundary
- Anchorage Area
- Port Limits
- Spoil Ground

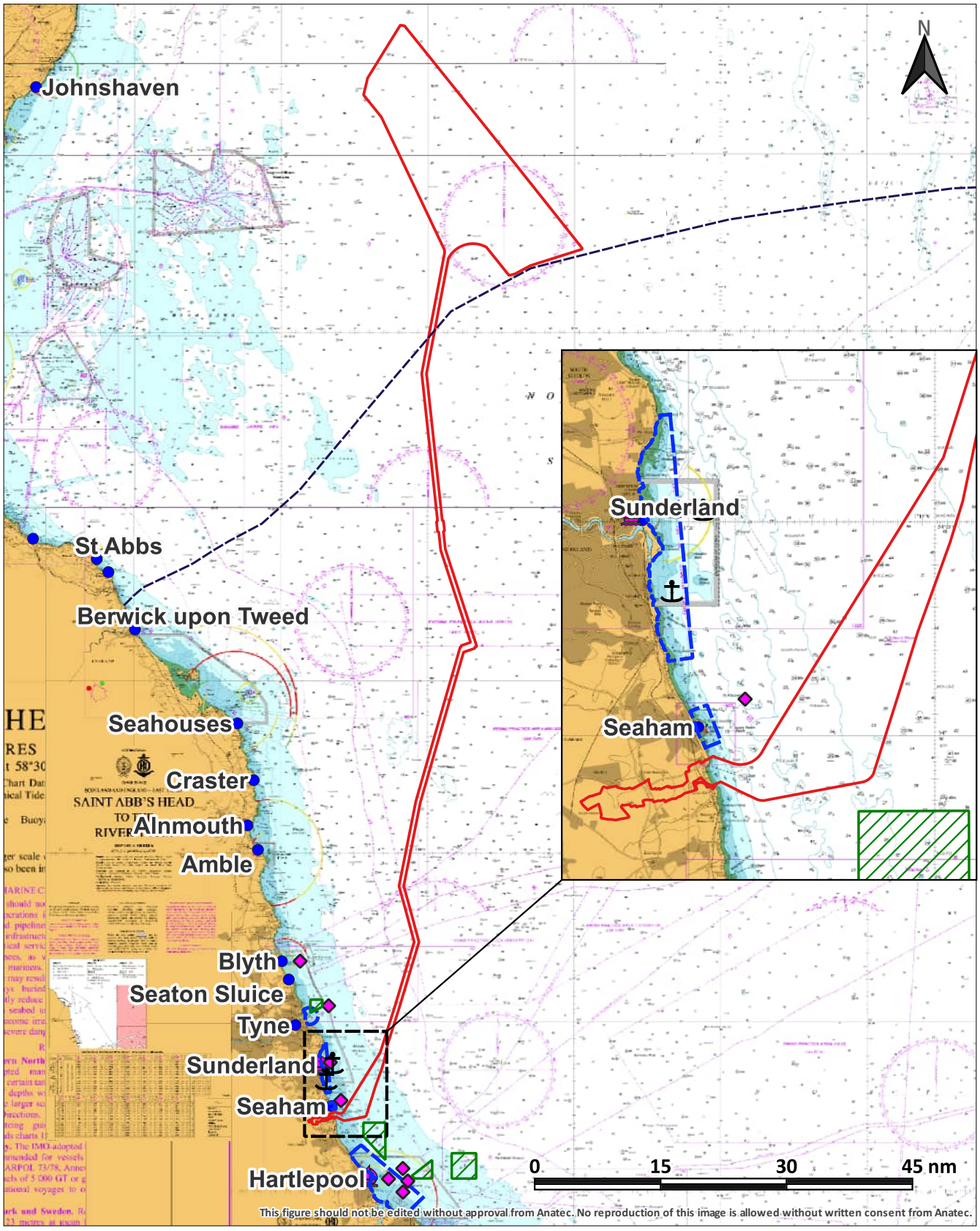
Navigational Features

- Aids to Navigation
- Boat Marina
- Charted Anchorage
- Pilot Boarding Stations
- Ports and Harbours
- Wrecks and Obstructions
- Cables
- Pipelines



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 7.2: Navigational Features in Proximity to the Landfall	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		



Legend

- MHPGC Project PEIR Red Line Boundary
- English-Scottish Maritime Boundary

Navigational Features

- Boat Marina
- Charted Anchorage
- Pilot Boarding Stations
- Ports and Harbours
- Anchorage Area
- Port Limits



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 7.3: Ports, Harbours and Related Facilities	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

7.2 Subsea infrastructure

65. **Figure 7.4** presents the locations of charted subsea infrastructure in proximity to the MHPGC Project PEIR Red Line Boundary. It is noted that the baseline environment covers only existing infrastructure. There are no planned crossings with charted subsea infrastructure in Scottish waters.

66. Three charted subsea cables cross the MHPGC Project PEIR Red Line Boundary within English waters, 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 91 and 95m LAT.

67. In addition to the crossings, a disused charted cable also stops short of the MHPGC Project PEIR Red Line Boundary in a similar area, and a further four subsea cables are located approximately 13nm south of the MHPGC Project landfall, all in English waters. Future subsea cables are considered as part of the cumulative screening in **Section 14**.

68. There are no planned crossings with existing charted oil and gas pipelines, with the closest of these to the MHPGC Project PEIR Red Line Boundary is the oil pipeline to the Ekofisk field located approximately 9nm southeast of the landfall in English waters. There is a charted water outfall pipe located within the MHPGC Project PEIR Red Line Boundary in the landfall area.

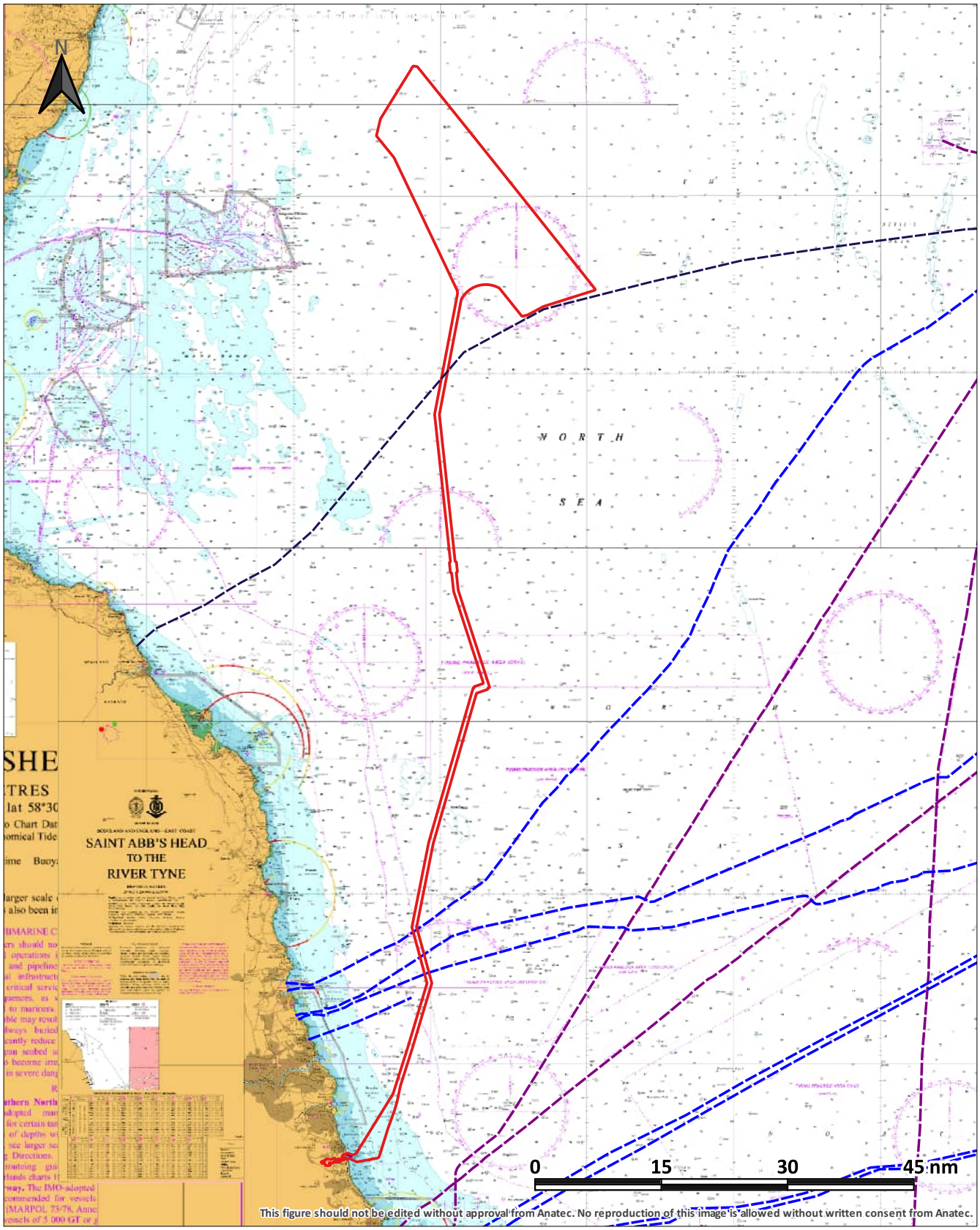
7.3 Military practice and exercise areas

69. **Figure 7.1** presents the locations of the military firing practice areas in proximity the Shipping and Navigation Study Area. One of these overlaps the MHPGC Project PEIR Red Line Boundary in English waters, with this being the Royal Air Force (RAF) firing practice area D513.

70. Other nearby exercise areas include submarine exercise areas to the west of the Shipping and Navigation Study Area in Scottish waters, and another RAF area D412 to the southeast in English waters. A chart note states that no restrictions are placed on navigation at any time, and that the areas are operated on a clear range procedure. Exercises only take place in the areas when they have been considered to be clear of all shipping.

7.4 Oil and gas infrastructure

71. There is limited oil and gas infrastructure in proximity to the MHPGC Project PEIR Red Line Boundary, with the closest charted well located 9.7nm northwest of the northern extent in Scottish waters. As noted previously, a number of pipelines make landfall at the entrance to the Tees, approximately 9nm south of the landfall of the MHPGC Project PEIR Red Line Boundary in English waters.



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Legend

- MHPGC Project PEIR Red Line Boundary
- English-Scottish Maritime Boundary

Navigational Features

- Cables
- Pipelines



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 7.4: Subsea Infrastructure	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

7.5 Offshore wind farms

72. **Figure 7.1** presents the locations of operational and under construction offshore wind farms in proximity to the Shipping and Navigation Study Area. To the north of the MHPGC Project PEIR Red Line Boundary in Scottish waters are Seagreen offshore wind farm (OWF), located approximately 15nm to the west, with Kincardine floating OWF located approximately 23nm to the northwest. Inch Cape and Neart na Gaoithe are currently under construction and are located within 40nm of the MHPGC Project PEIR Red Line Boundary, again in Scottish waters.

73. In English waters, the closest offshore wind farms are Teesside and Blyth Demonstrator, each located approximately 10nm from the MHPGC Project PEIR Red Line Boundary.

74. Future offshore wind farms are discussed in more detail as part of the future baseline in **Section 10.1**, considered as part of the cumulative screening in **Section 14**.

7.6 Spoil grounds

75. The charted Nose's Point spoil ground is located close to the landfall on the 160m north of the MHPGC Project PEIR Red Line Boundary in English waters, as shown in **Figure 7.2**. There is another two spoil grounds off Sunderland and Tynemouth, approximately 2nm and 2.5nm from the MHPGC Project PEIR Red Line Boundary; again both in English waters. There are no aggregate dredging areas in proximity to the MHPGC Project PEIR Red Line Boundary.

7.7 Other navigational features

76. There are a number of other navigational features in the area, including charted wrecks and aids to navigation, as presented in **Figure 7.1**.

77. Aids to navigation (AtoN) are generally located along the coast, and are associated with port or harbour entrances, or marking the coast itself. The only charted AtoN within the MHPGC Project PEIR Red Line Boundary is at the landfall in English waters, marking the end of an outfall pipe which extends approximately 1nm out from the shore, on the northern edge of the MHPGC Project PEIR Red Line Boundary. Other than this, the closest AtoNs to the MHPGC Project PEIR Red Line Boundary are located at the entrance to Seaham Harbour, approximately 0.9nm north of the landfall in English waters.

78. Charted wrecks are present throughout, with a particularly large number in nearshore areas in both English and Scottish waters. There are 22 charted wrecks located within the MHPGC Project PEIR Red Line Boundary; five within Scottish waters and 17 within English waters.

8 Emergency response overview

79. This section summarises the existing emergency response resources (including SAR) and reviews historical maritime incident data to establish baseline incident rates in proximity to the MHPGC Project PEIR Red Line Boundary.

8.1 Marine rescue co-ordination centres and joint rescue co-ordination centres

80. HMCG is a division of the MCA, and is responsible for requesting and tasking SAR resources available to other authorities and for coordinating subsequent SAR operations (except for those which fall within military jurisdiction) in both English and Scottish waters.

81. All of the MCA's operations, including those relating to SAR, are divided into 18 distinct geographical regions. The MHPGC Project PEIR Red Line Boundary spans three of these:

- Area 3: "East Scotland";
- Area 4: "Inner Clyde to River Tay and East Scottish Border";
- Area 5: "North East England".

82. SAR operations are coordinated via a network of 11 Maritime Rescue Coordination Centres (MRCCs), including a Joint Rescue Coordination Centre (JRCC) in Hampshire. The closest MRCCs to the MHPGC Project PEIR Red Line Boundary are Aberdeen MRCC (approximately 35nm northwest of the MHPGC Project PEIR Red Line Boundary in Scottish waters), and the Humber MRCC in Bridlington (approximately 56nm south of the landfall in English waters). It is noted that incident response is not necessarily coordinated by the closest MRCC, as calls may be re-routed to other MRCCs if nearby operators are unavailable.

8.2 Search and rescue helicopters

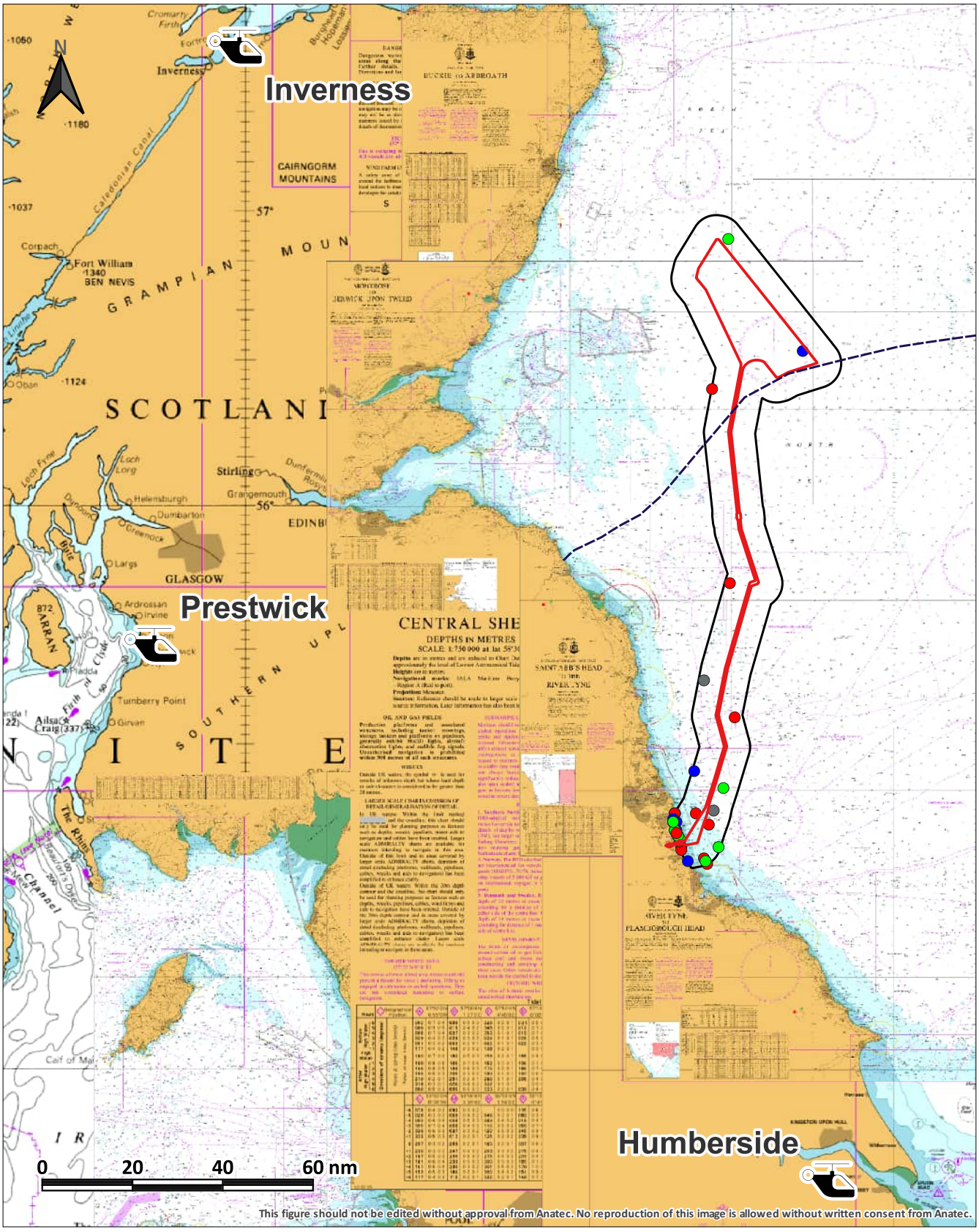
83. UK SAR helicopter operations have been conducted by the Bristow Group under contract from the MCA (as an executive agency of the DfT) since April 2015, with a new 10 year contract beginning in September 2024 for both English and Scottish waters.

84. SAR helicopters are operated from 10 bases around the UK, with two further seasonal bases (operating April to September) in Oban and Carlisle opening in 2026 (UK Government, 2025). The permanent bases relevant to the MHPGC Project PEIR Red Line Boundary are Humberside (80nm south), Inverness (100nm northwest) and Prestwick (120nm west), as shown in **Figure 8.1** alongside SAR helicopter tasking data recorded between April 2015 and March 2025 provided by the DfT.

85. Over the 10-year period, there were 46 taskings recorded within the Shipping and Navigation Study Area, corresponding to an average of approximately four to five per

year. Three of these incidents occurred within Scottish waters, with Prestwick responding to one incident and Inverness responding to two. The remaining 41 taskings occurred within English waters with the majority of these taskings mobilised from the Humberside base (89%), with the majority located in coastal areas around the landfall location.

86. The most common tasking type was rescue/recovery, making up 43% of all taskings, with support (30%) and search only (20%) taskings also making up a significant proportion.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

SAR Helicopter Tasking Type

- Aborted/not Required
- Rescue/recovery
- Search Only
- Support

SAR Helicopter Base



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Project	Figure Title	Date: 29/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 8.1: SAR Helicopter Bases and Helicopter Taskings (April 2015 - March 2025)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

8.3 Royal National Lifeboat Institution

87. The RNLI operates out of more than 230 lifeboat stations across the UK, with over 400 active lifeboats in the fleet, including all-weather and inshore lifeboats. The RNLI is organised into six divisions, with the MHPGC Project PEIR Red Line Boundary located within the "North and East" and "Scotland" divisions. RNLI stations along the east UK coast in proximity to the MHPGC Project PEIR Red Line Boundary are presented in **Figure 8.2**, along with incident data detailing RNLI lifeboat callouts from 2016 to 2025 colour coded by incident type in both English and Scottish waters.

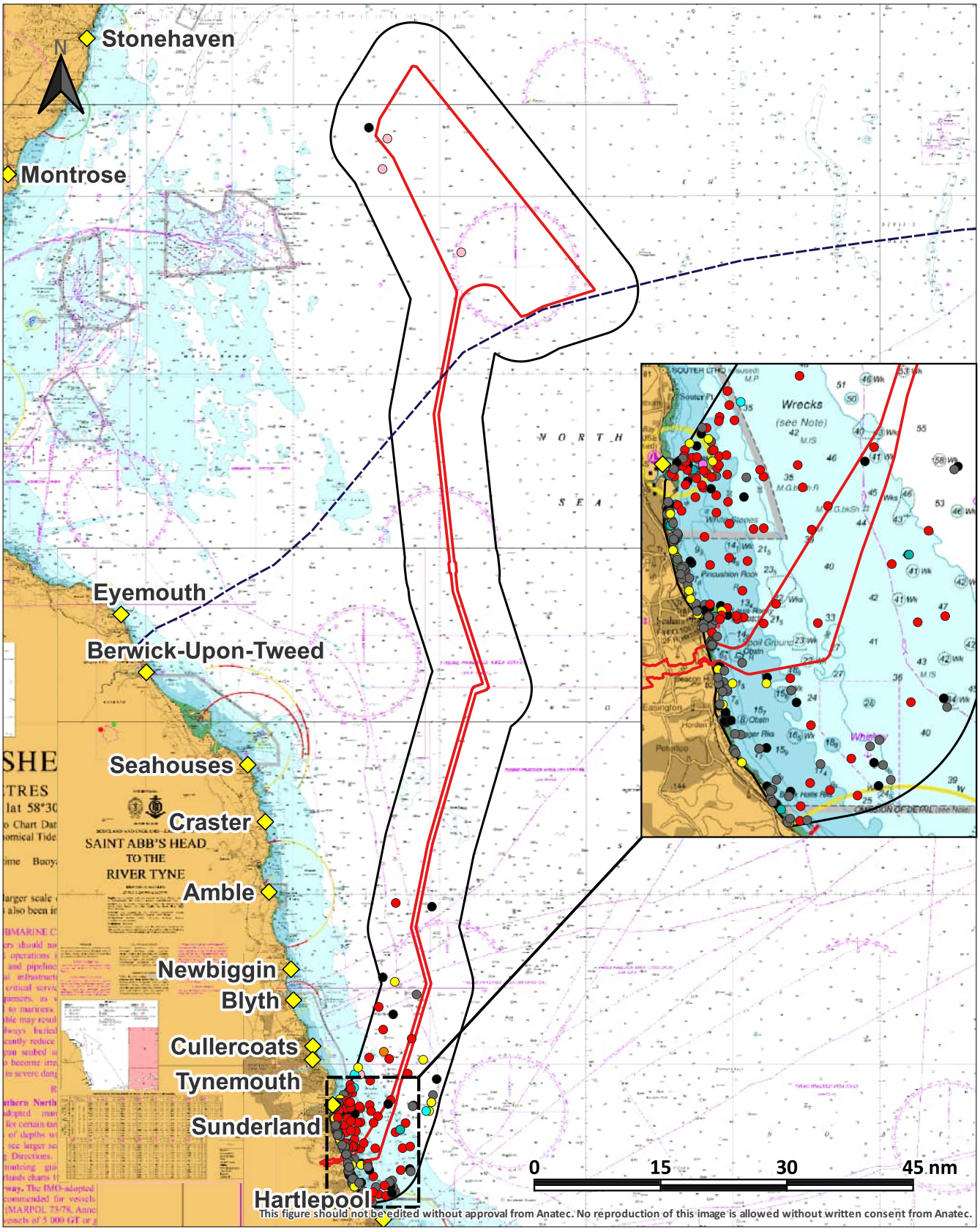
88. The closest stations to the MHPGC Project PEIR Red Line Boundary are those around the landfall, with Sunderland located approximately 5.8nm north of the landfall and Hartlepool approximately 7nm south. Although the RNLI may provide assistance to incidents anywhere in UK waters, the vast majority of responses are to incidents within UK territorial waters (12nm). Therefore, it can be expected that should an incident occur within the offshore sections of the MHPGC Project PEIR Red Line Boundary then HMCG are likely to be the first and primary responder, although it remains possible the RNLI may support.

89. Incident data detailing RNLI lifeboat callouts from 2016 to 2025 has been analysed. It is noted that hoaxes and false alarms have been excluded from the analysis, with 32 of these recorded in the 10 year period within the Shipping and Navigation Study Area.

90. Over the 10 year period, 321 incidents were reported within the Shipping and Navigation Study Area, corresponding to an average of 32 incidents per year. Of these, four were located in Scottish waters, with the remaining 317 in English waters. Incidents in English waters were predominantly in nearshore areas, particularly around the landfall.

91. 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 (28%). The most common vessel types were recreational (19%, between powered, sailing and other recreational) and fishing (13%) vessels.

92. The most common stations responding to incidents within the Shipping and Navigation Study Area were those in proximity to the landfall in English waters, led by Sunderland (58%), Hartlepool (27%) and Tynemouth (11%). No other station responded to more than 2% of incidents. For those incidents in Scottish waters, Montrose responded to three incidents while Aberdeen responded to one.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary
- RNLI Stations

RNLI Incident Type

- Capsize
- Collision
- Grounding
- Machinery Failure
- Other
- Person in Danger
- Sail Failure
- Steering Failure
- Unspecified
- Vessel May be in Trouble
- Fire/Explosion



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 8.2: RNLI Lifeboat Stations and Incidents by Incident Type (2016 - 2025)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

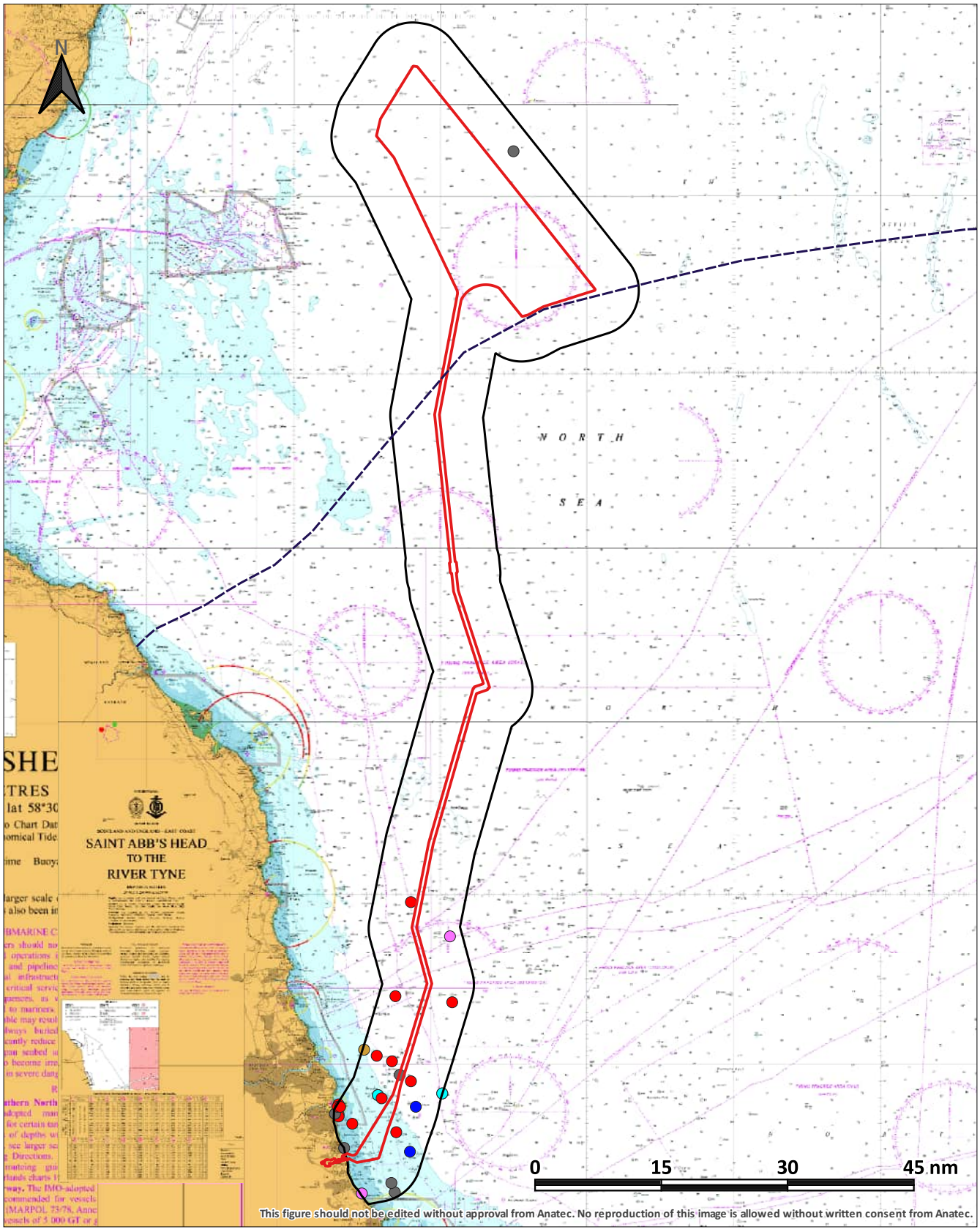
8.4 Marine Accident Investigation Branch

93. Incident data is also provided by the MAIB, covering a 10-year period between 2016 and 2025. This data is presented within the Shipping and Navigation Study Area colour coded by incident type in **Figure 8.3**.

94. In total there were 30 incidents recorded by the MAIB over the 10-year period, corresponding to an average of three per year. One of these incidents was located in Scottish waters, with the remaining 29 of these incidents occurred with English waters.

95. The most common incident types were machinery failures (43%), followed by accidents to person (20%). Two collision incidents were recorded within English waters with one of these involving two fishing vessels, and another involving a cargo vessel and fishing vessel. Neither collision resulted in injuries or fatalities, with the only consequence being minor damage in the case of the collision involving two wooden hulled fishing vessels.

96. Fishing vessels accounted for 47% of incidents, with recreational vessels (17%), cargo vessels (17%) and tankers (13%) also involved. Similarly to the other incident data sources, MAIB incidents were more frequent in coastal areas, with only one reported beyond 20nm offshore (the incident in Scottish waters).



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

MAIB Incident Type

- Accident To Person
- Capsizing/listing
- Collision
- Damage / Loss Of Equipment
- Fire/explosion
- Flooding/foundering
- Machinery Failure



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 8.3: MAIB Incidents by Incident Type (2016 - 2025)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9 Vessel traffic movements

9.1 Overview

97. This section characterises vessel traffic movements in relation to the MHPGC Project PEIR Red Line Boundary. Analysis of vessel traffic data is undertaken within the Shipping and Navigation Study Area identified in **Section 2.1**, primarily via analysis of the pre-defined data period; 12 months of AIS data spanning from October 2024 to September 2025 [see **Section 6.1**]. VMS data was also reviewed as an additional source for fishing vessel movements [see **Section 6.2**].

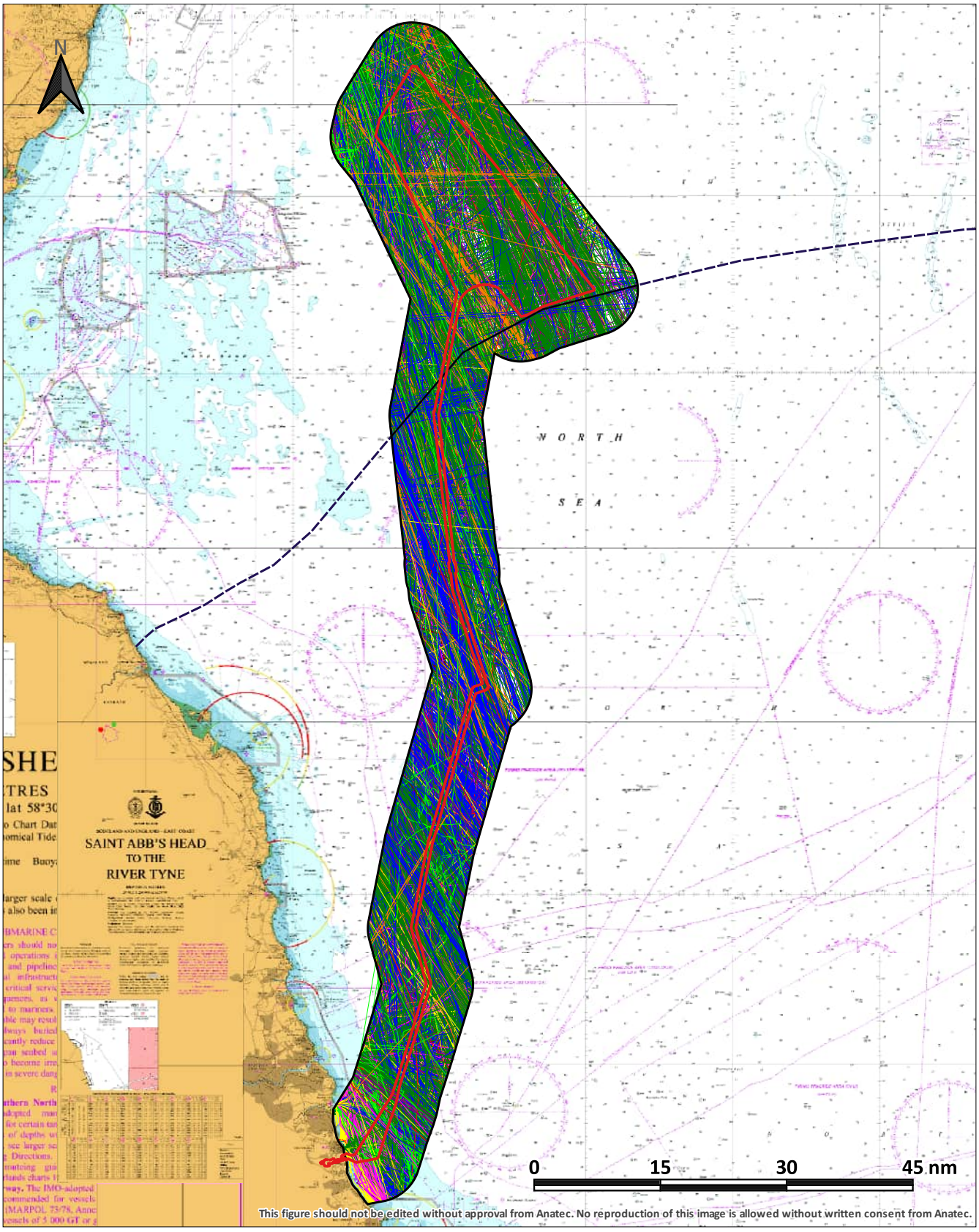
98. To ensure a dataset that is representative of typical vessel traffic movements, a proportion of the traffic recorded within the Shipping and Navigation Study Area was excluded as temporary (non-routine) in nature. This included traffic associated with:

- Construction of offshore wind farms such as Neart na Gaoithe, Sofia, and the Dogger Bank developments;
- Guard vessels and installation vessels for subsea cables under construction;
- Survey/research vessels actively undertaking such activities;
- Temporary drilling operations (including temporary drilling rigs).

99. These vessels were excluded from the analysis below and overall accounted for 9% of all vessel tracks recorded across the data period.

100. Although included in the Shipping and Navigation Study Area, vessels moored within Seaham Harbour have also been removed to ensure the analysis focuses on vessels active in the open sea. Transits to/from Seaham Harbour have been retained.

101. An overview of all remaining vessel traffic included in the analysis throughout this section in presented in **Figure 9.1**.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Type

- Unspecified
- Fishing
- Military
- Dredging
- Underwater Ops
- Tug
- Passenger
- Cargo
- Tanker
- Other
- Recreational
- Oil and Gas
- Wind Farm



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.1: Overview of Vessel Traffic Movements with Maritime National Limit (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.2 Vessel numbers

102. The average number of unique vessels recorded per day for each month of the data period within the Shipping and Navigation Study Area, categorised by vessel type, is presented in **Figure 9.2**. The breakdown of these vessel numbers by English and Scottish waters is then included in **Section 9.4.1**.

103. Unspecified and military vessels were recorded in low volumes across the data period and while included in the dataset, their numbers are too low to be visible in **Figure 9.2**. Vessel type distribution is assessed in **Section 9.4**.

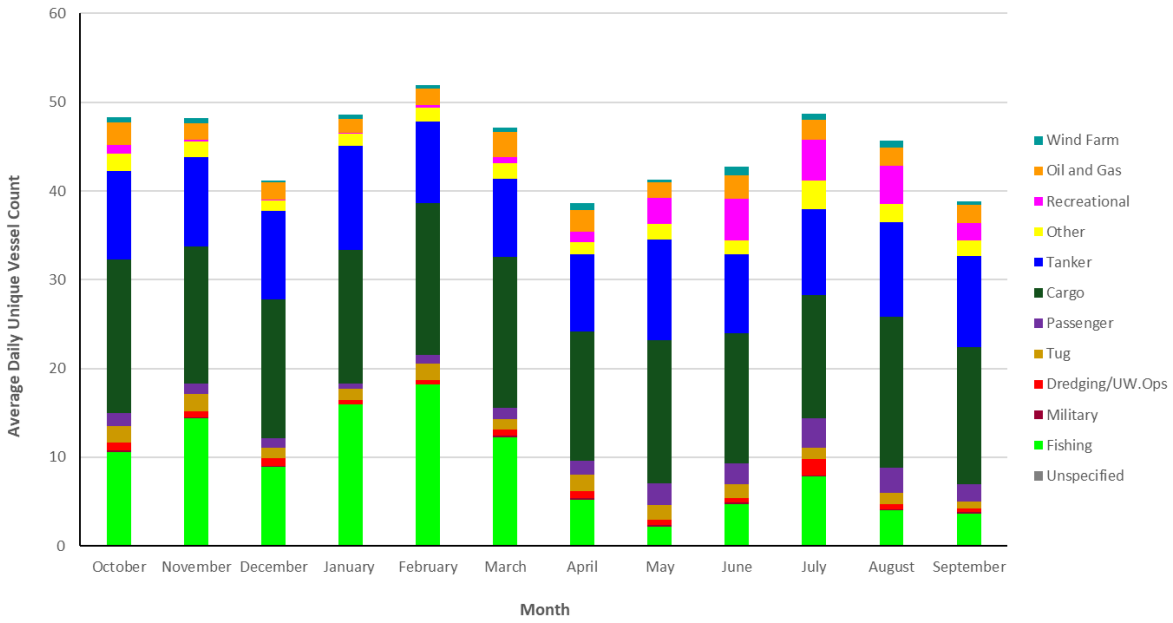


Figure 9.2: Daily average number of vessels within Shipping and Navigation Study Area per month per vessel type (12 Months, 2024/25)

104. 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.

105. There was some variation in overall traffic levels within the Shipping and Navigation Study Area. Traffic levels were generally at their highest during the winter months when fishing vessel activity peaked but this was somewhat offset during the summer months when passenger and recreational vessel activity peaked. Volumes for the

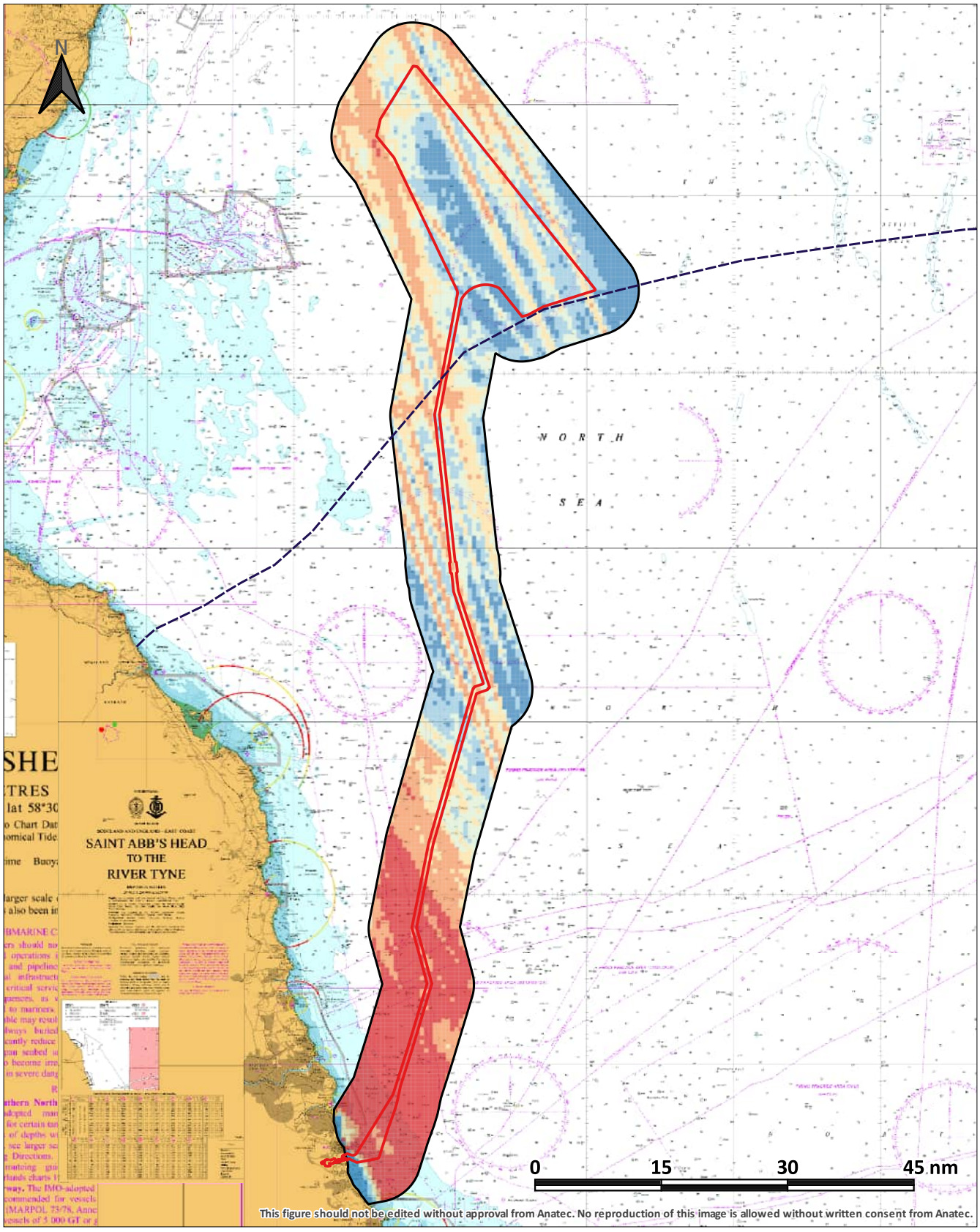
two leading vessel types, cargo vessels and tankers, were relatively consistent over the data period.

9.3 Vessel density

106. **Figure 9.3** presents a vessel density plot of the dataset within a 0.5 × 0.5nm grid spanning the Shipping and Navigation Study Area.

107. Vessel traffic density was greatest in the coastal areas overlapping the southern portion of the Shipping and Navigation Study Area, typically resulting from vessels making coastal passages, as well as the presence of small craft likely to be present further inshore that that seen in the northern portion of the Shipping and Navigation Study Area. Aligning with this, the lowest areas of vessel traffic density occur to the north at the regions further offshore.

108. Defined routeing can also be identified from the vessel density illustrated in **Figure 9.3**. North-south and east-west routeing primarily associated with tankers can be seen in the centre of the Shipping and Navigation Study Area, with cargo vessel routeing also identified in the northern portion of the Shipping and Navigation Study Area.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Density

- Highest
- Lowest



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.3: Vessel Density Within Shipping and Navigation Study Area (12 Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.4 Vessel type

109. **Figure 9.4** presents the distribution of vessel types recorded within the Shipping and Navigation Study Area. Vessel type was available for nearly all unique vessels recorded across the data period (more than 99.9%). Unspecified vessels were excluded from the analysis where relevant.

110. The breakdown of these vessel types by English and Scottish waters is then included in **Section 9.4.1**.

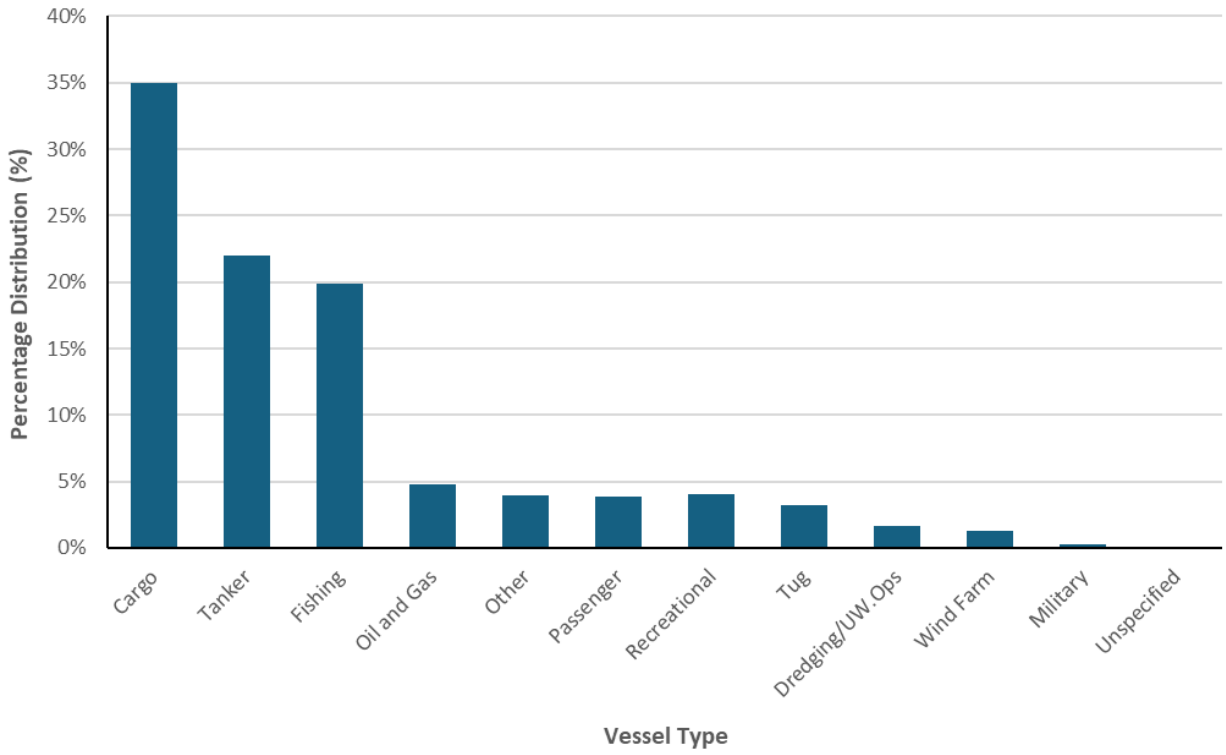


Figure 9.4: Distribution of vessel types (12 Months, 2024/25)

111. 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.

112. It is noted that vessels classed as “Other” accounted for 4% of all vessel traffic. These vessels included pilot vessels undertaking pilotage activity associated with the Port of Sunderland. These vessels were recorded on average once per day across the data period. No active pilotage occurred within the MHPGC Project PEIR Red Line Boundary and remained in proximity to the pilot boarding station. Other vessels grouped under “Other” include RNLI lifeboats, fishery patrol vessels, research and survey vessels under transit, and work and training vessels.

9.4.1 Breakdown by maritime national limits

113. The maritime national limit between Scotland and England passes through the Shipping and Navigation Study Area and is shown alongside the vessel traffic movements across the data period in **Figure 9.1**. The percentage breakdown of the vessel types recorded within the Shipping and Navigation Study Area for each of Scottish and English waters, and as a whole for comparison is shown in **Figure 9.5**. Following this, **Figure 9.6** shows the breakdown in average daily vessel counts per month within the Shipping and Navigation Study Area for each of Scottish and English waters, and as a whole for comparison.

114. A total of 91% of all vessel traffic recorded in the Shipping and Navigation Study Area intersects English waters and 21% intersects Scottish waters. Distribution of vessel counts across English waters within the Shipping and Navigation Study Area correlated to that of the Shipping and Navigation Study Area as a whole, with February displaying the highest daily average counts, as expected given the percentage of vessels recorded within English waters. As for Scottish waters, July exhibited the highest daily average counts.

115. In Scottish waters, cargo vessels and oil and gas vessels were recorded in greater proportions in Scottish waters when compared with English waters and the whole Shipping and Navigation Study Area, with fishing vessels, recreational vessels, and dredgers/underwater operations vessels considerably lower.

116. As the majority of vessels were recorded within English waters, vessel counts and vessel type distributions for English waters broadly align with the Shipping and Navigation Study Area as a whole.

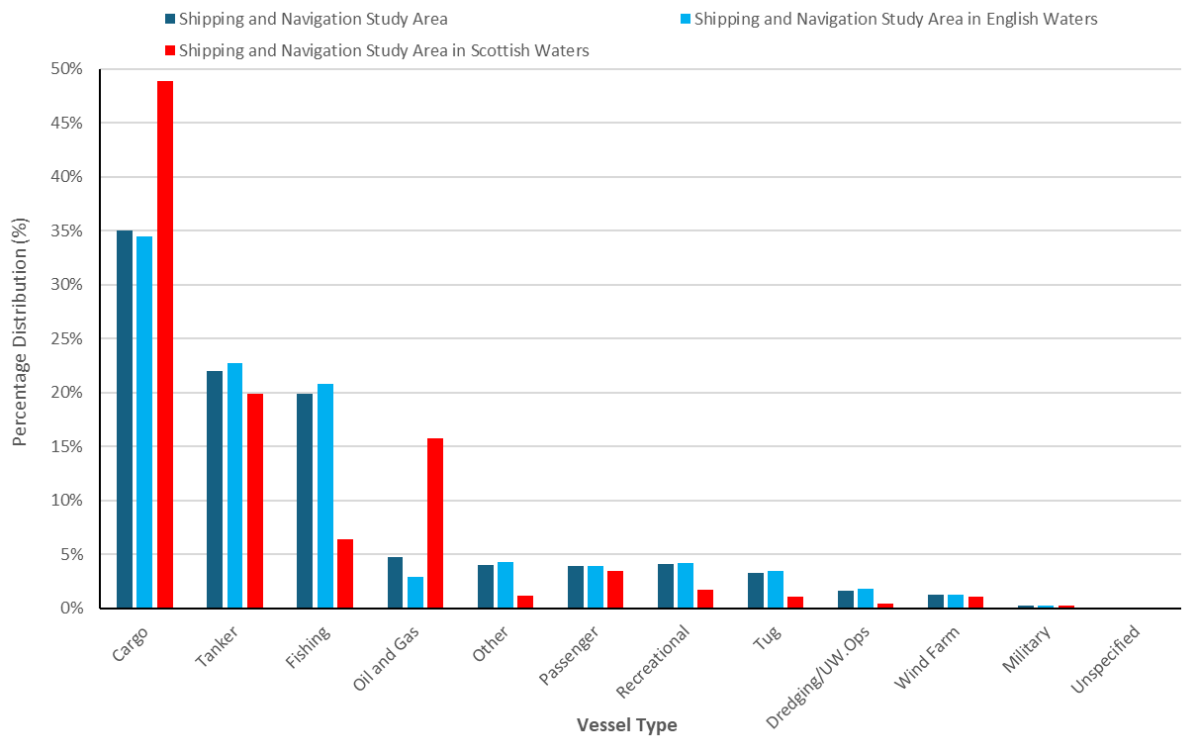


Figure 9.5: Distribution of vessel types across maritime national limit (12 Months, 2024/25)

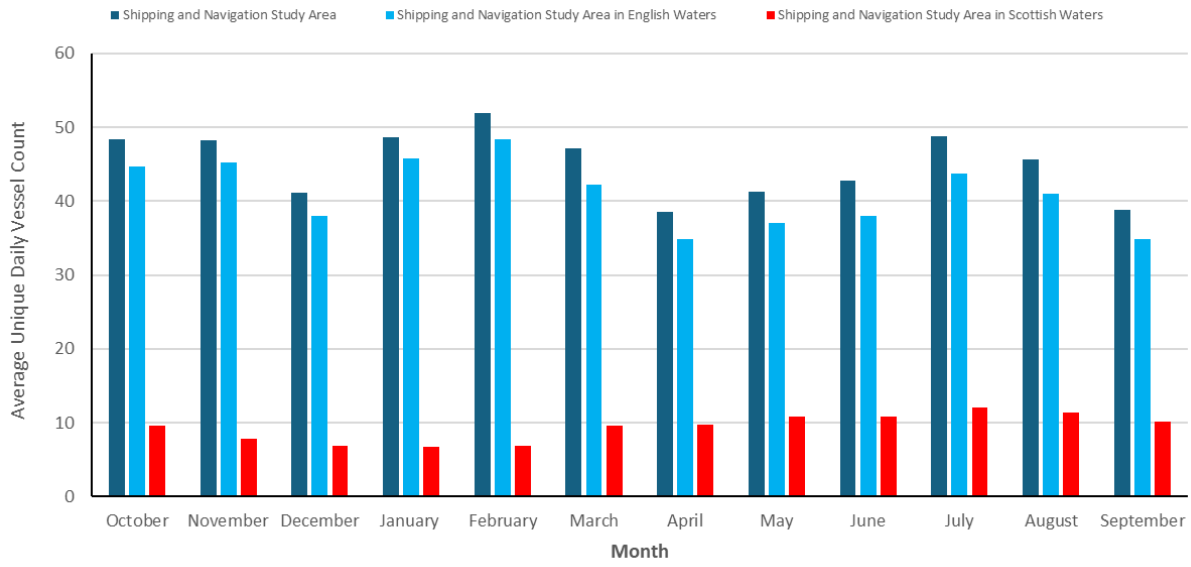


Figure 9.6: Daily average number of vessels across maritime national limit per month (12 Months, 2024/25)

9.4.2 Cargo vessels

117. **Figure 9.7** presents the cargo vessels recorded within the Shipping and Navigation Study Area across the data period.

118. Cargo vessels were the most commonly recorded vessel type across the data period with an average of 16 unique cargo vessels recorded per day. Seasonality was minor with cargo vessels recorded in slightly higher volumes in the autumn months with a peak of 17 to 18 unique vessels per day recorded in October and lowest numbers in July with an average of 14 unique vessels per day.

119. As for cargo vessel sub-type, the most commonly recorded was general cargo equating to 29% of all cargo vessels recorded. Following this, part-containerised (27%) and container cargo (18%) were also commonly recorded. Vehicle carrier (11%) and bulk carriers (10%) were the other sub-types which equated to more than 5% of all cargo vessels recorded.

120. Roll-On/Roll-Off cargo (RoRo) vessels were recorded at an average of one vessel per week (2.1% of all cargo vessels recorded). A regular 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. The vessel undertaking this route was swapped from the *Akranes* to the *Lista* in January 2025, part-way through the dataset (Shippax, 2025a). 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.

121. 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.

122. Other defined cargo vessel routeing included northwest southeast routeing through the north and centre of the Shipping and Navigation Study Area and mainly to the west of the MHPGC Project PEIR Red Line Boundary between a multitude of destinations including Aberdeen (UK), Immingham (UK) and other European ports as popular destinations. To the south of the Shipping and Navigation Study Area, cargo vessels were noted routeing primarily between the Port of Tyne (UK) and Dutch/Belgian ports on a west northwest to east southeast bearing. Other routeing vessels in this area were noted routeing to/from the Port of Sunderland to German ports; and routeing between Forth Ports (UK) and Rotterdam and Antwerp (Belgium).

123. A high number of cargo vessels were noted anchoring in the south of the Shipping and Navigation Study area, to the southeast of the MHPGC Project PEIR Red Line Boundary in the Whiskey anchorage and on approach to Seaham and Sunderland.

No anchoring activity occurred within the MHPGC Project PEIR Red Line Boundary with anchoring further discussed in **Section 9.5**.

9.4.3 Tankers

124. **Figure 9.8** presents the tankers recorded within the Shipping and Navigation Study Area across the data period.

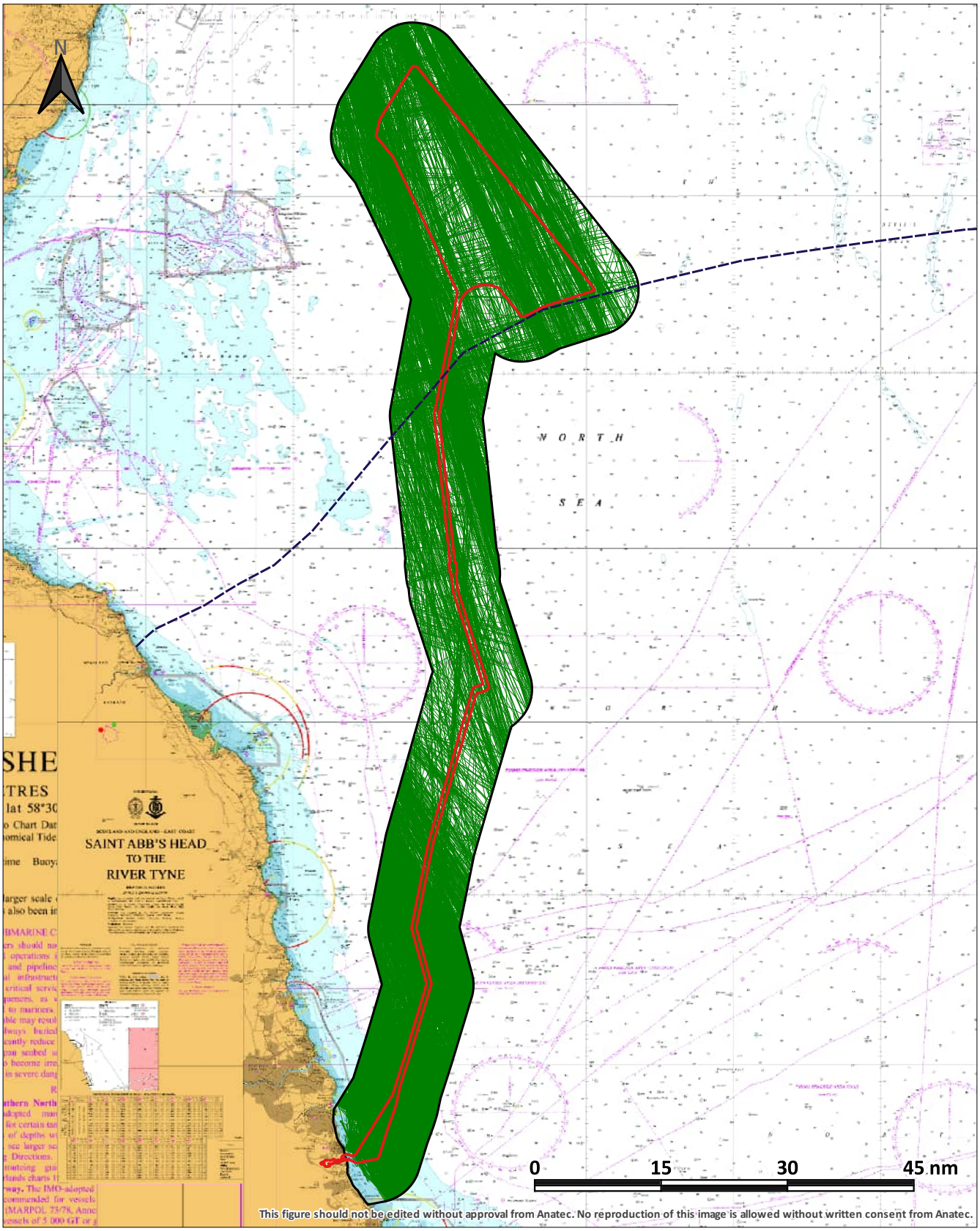
125. Tankers accounted for 20% of all vessels recorded across the data period with an average of 10 unique tankers recorded per day across the data period. Tankers displayed minor seasonality across the data period with a peak average of 11 to 12 unique vessels per day recorded in January to a low of eight to nine per day in April.

126. As for tanker sub-type, the most commonly recorded was combined oil/chemical tankers equating to 33% of all tankers recorded. Following this, product tankers (23%), chemical tankers (15%), Liquified Petroleum Gas (LPG) (13%) and crude oil tankers (10%) were also commonly recorded. No other sub-types equated to more than 5% of all tankers recorded.

127. 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. All of these tankers were routeing to and from the ports in the Firth of Forth, primarily Grangemouth and Braefoot (UK), and Dutch ports and Antwerp (Belgium). Tankers routeing at the south of the Shipping and Navigation Study Area were also noted routeing to/from Sunderland and various European ports.

128. Tankers were also noted routeing more north-south through the centre of the Shipping and Navigation Study Area on several defined routes between Immingham (UK) and north Scotland ports including Aberdeen, Peterhead, Inverness (UK).

129. As with cargo vessels, a high number of tankers were noted anchoring in the south of the Shipping and Navigation Study area, to the southeast of the MHPGC Project PEIR Red Line Boundary in the Whiskey anchorage and on approach to Sunderland. No anchoring activity occurred within the MHPGC Project PEIR Red Line Boundary and is further discussed in **Section 9.5**.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

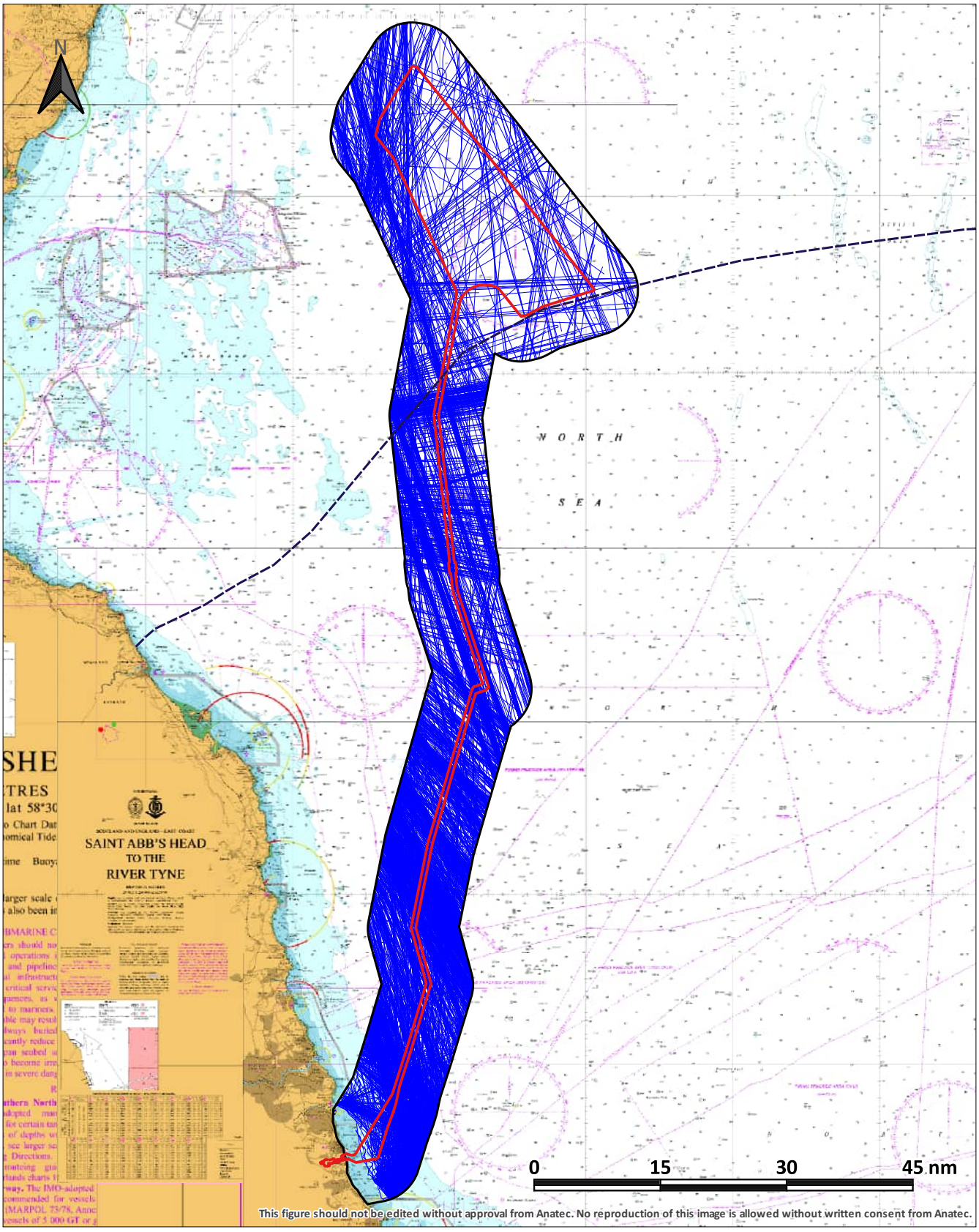
Vessel Type

- Cargo



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.7: Cargo Vessel Traffic Movements (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		



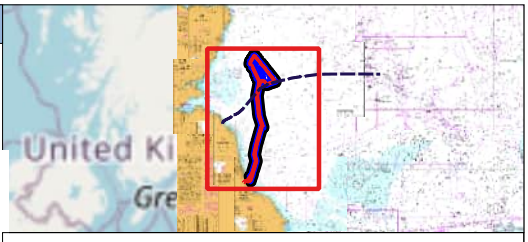
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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Type

- Tanker



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.8: Tanker Traffic Movements (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.4.4 Fishing vessels

9.4.4.1 AIS data

130. Fishing vessels accounted for 20% of all vessels recorded across the data period with an average of nine unique fishing vessels recorded per day. Fishing vessels displayed high levels of seasonality as illustrated in **Figure 9.9**, with vessels more prominent in the late autumn and winter months with a peak of 18 unique vessels per day recorded in February. Lower vessel numbers were recorded across the spring and summer months, with a drop to an average of two unique vessel per day in May. It is noted that fishing vessels may be under-represented on AIS, with it noted during consultation (see Section 5.2) that there is an active fleet of potters out of Sunderland which is not wholly represented on AIS.

131. **Figure 9.10** presents all fishing vessels recorded within the Shipping and Navigation Study Area across the data period, colour-coded by gear type.

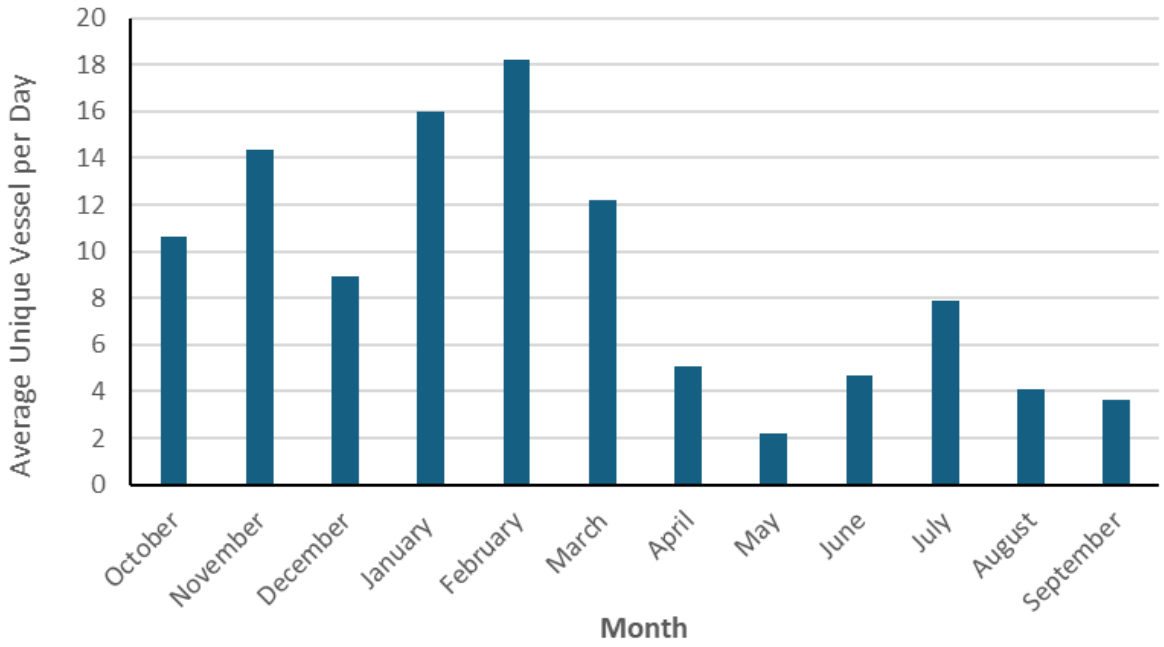


Figure 9.9: Daily average number of fishing vessels within Shipping and Navigation Study Area per month per vessel type (12 Months, 2024/25)

132. More than 99% of all fishing vessels were able to be associated with a gear type. Of those vessels with a valid gear type, 67% of vessels utilised otter bottom trawls. Pots and traps (14%) and otter twin trawls (8%) were also commonly recorded with no other gear type accounting for more than 5% of all fishing vessels recorded.

133. To highlight potential fishing vessel behaviour, average vessel speed along with vessel track behaviour and information broadcast via AIS can be used to identify vessels which may be engaged in active fishing as opposed to vessels on transit. For fishing vessels likely on transit, vessels 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.

134. 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. This activity was primarily from otter bottom trawls and otter twin trawls. Pots and traps, nephrop trawls, and boat dredgers were also recorded in the south likely engaged in active fishing but occurred closer to the coast. Two vessels were also recorded likely actively fishing to the north of the Shipping and Navigation Study Area, both vessels utilised pots and traps with the majority of this activity occurring outside the MHPGC Project PEIR Red Line Boundary.

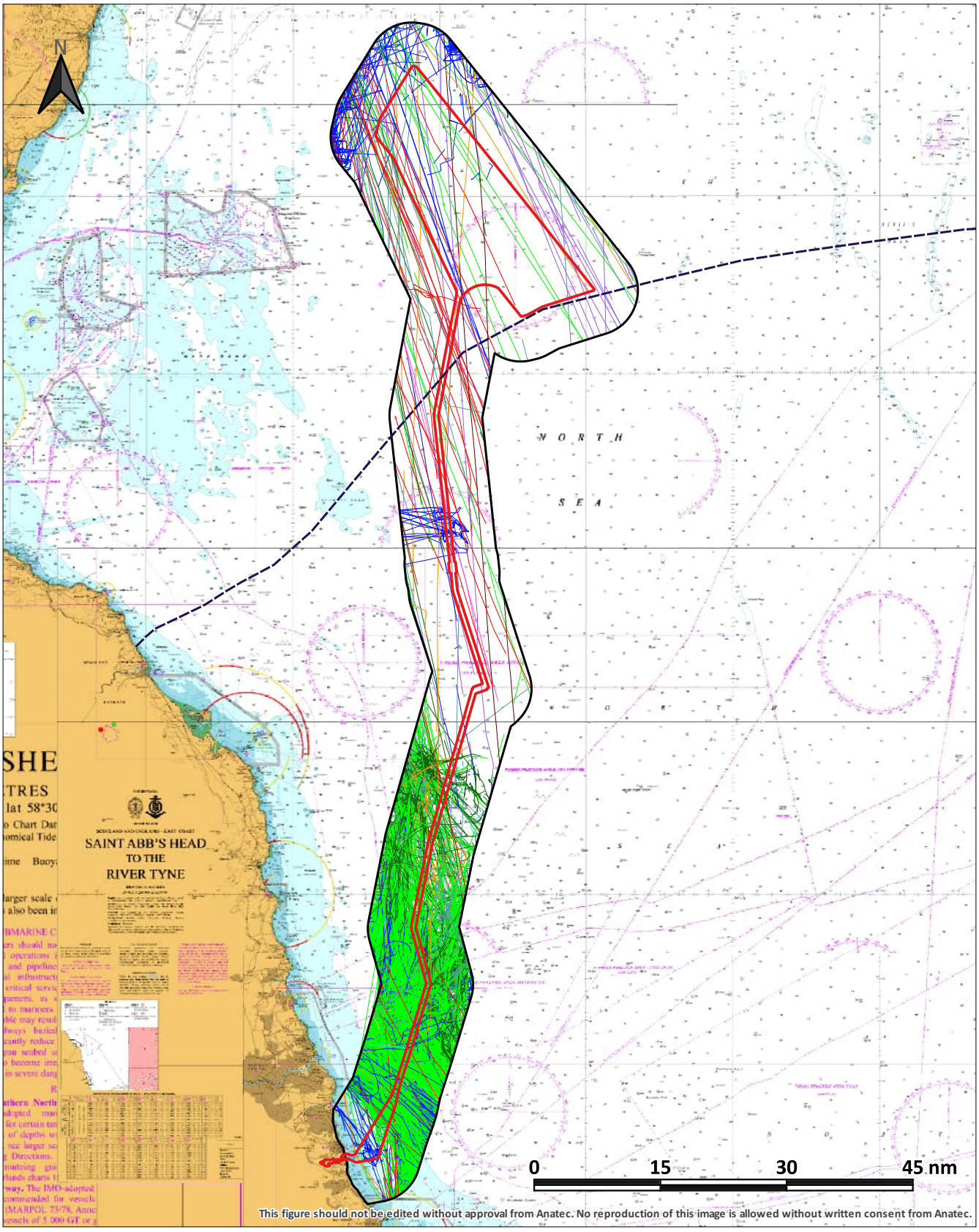
135. All fishing vessels were able to be associated with a country of registration. A total of 99% of all fishing vessels recorded were registered in the UK.

9.4.4.2 VMS data

136. VMS fishing data for Scottish waters provided by MD-LOT for 2025 has been reviewed and is presented in **Figure 9.11**.

137. VMS fishing data primarily for English waters provided by the MMO for 2020 has been reviewed and is presented in **Figure 9.12**. It is noted that data from 2020 is the latest available at the time of writing (November 2025). Satellite data captures fishing vessels that are at least 15m length and therefore those below 15m length may be under-represented.

138. The VMS data shown across both datasets broadly aligns with the AIS data reviewed in the previous subsection, indicating that fishing vessels are distributed towards the southern half of the Shipping and Navigation Study Area, with vessel numbers in the north being minimal and contained to the outer areas of the Shipping and Navigation Study Area.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

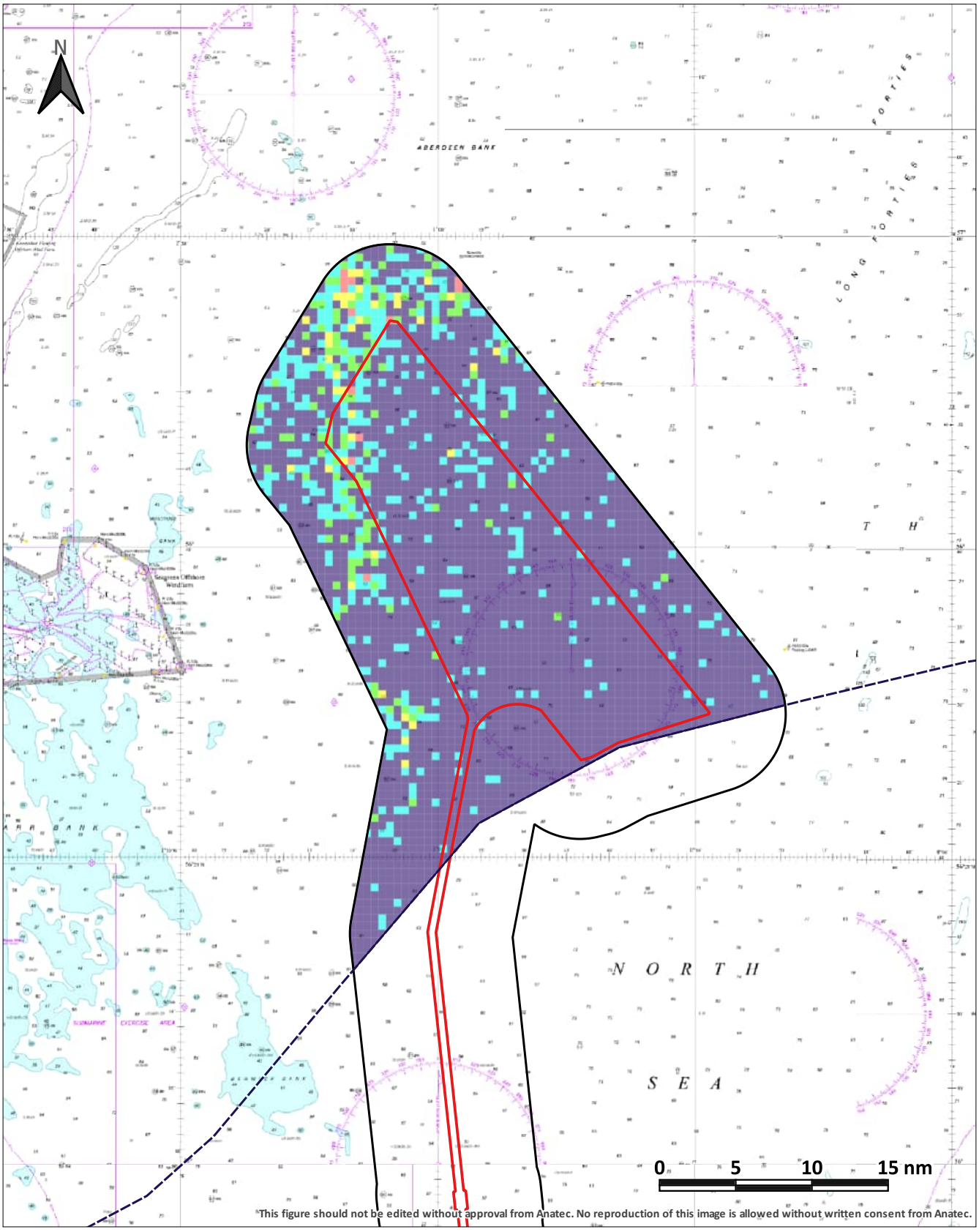
Fishing Vessel Gear Type

- Boat Dredges
- Bottom pair trawls
- Midwater pair trawls
- Midwater trawls (not specified)
- Nephrops Trawls
- Otter trawls - bottom
- Otter trawls - midwater
- Otter twin trawls
- Pots and Traps
- Scottish seines
- Set gillnets (anchored)
- Unknown gear



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.10: Fishing Vessel Traffic Movements by Gear Type (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

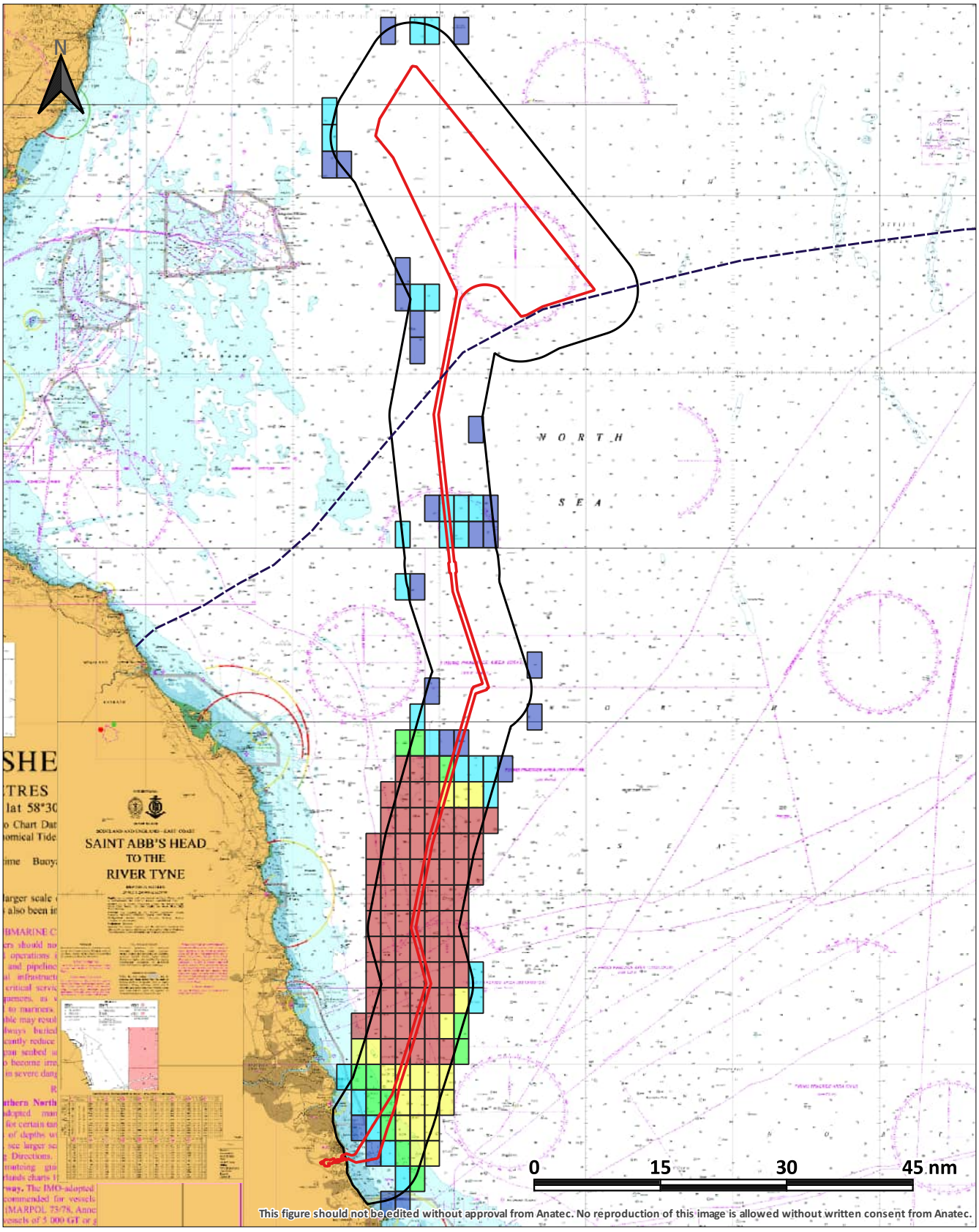
VMS Density

- Highest
- Lowest



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 9.11: MD-LOT VMS Data (12-Months, 2025)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

VMS Density

- Highest
- Lowest



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.12: MMO VMS Data (12-Months, 2020)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.4.5 Oil and gas vessels

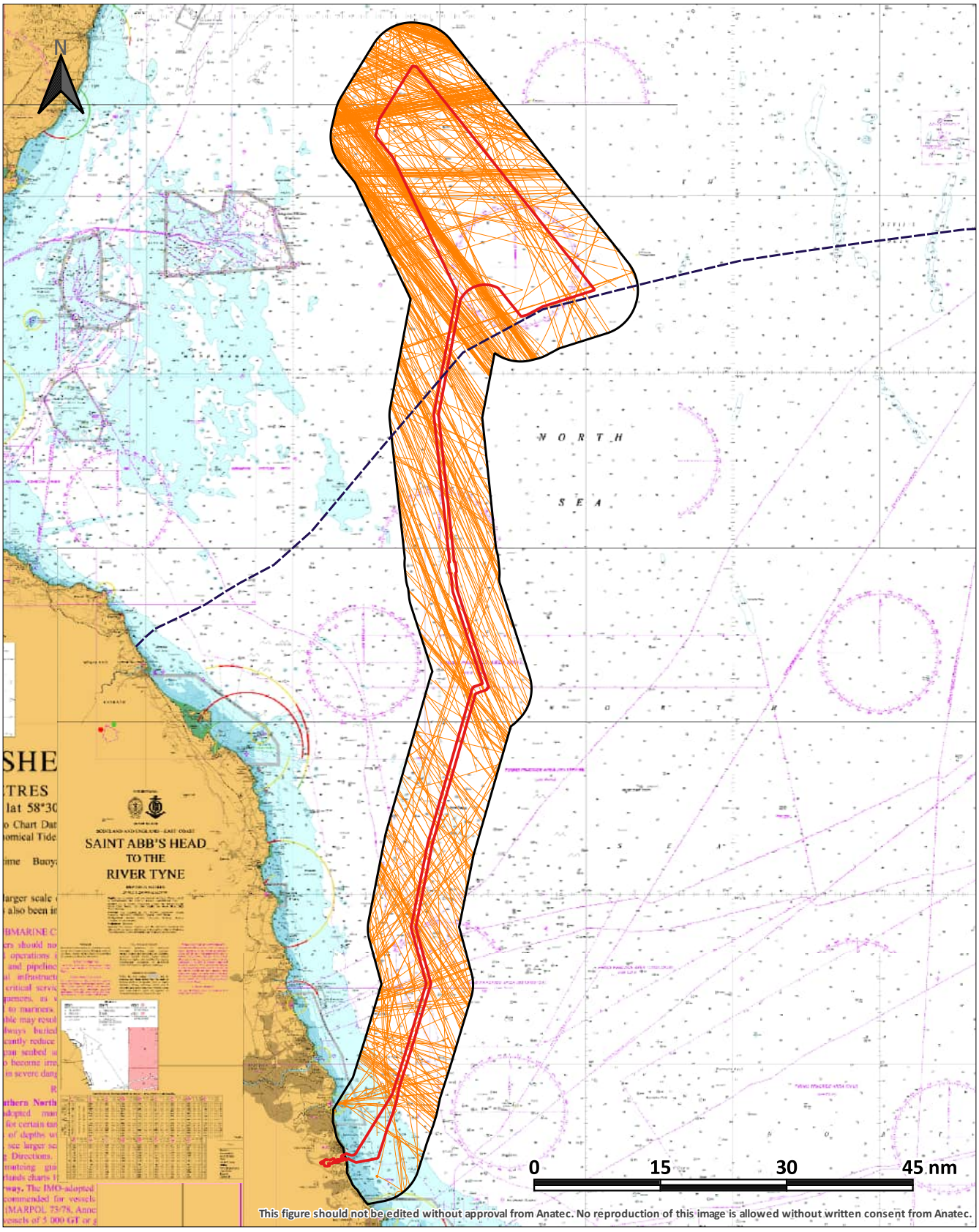
139. **Figure 9.13** presents the oil and gas vessels recorded within the Shipping and Navigation Study Area across the data period.

140. An average of two unique oil and gas vessels per day were recorded across the data period. Oil and gas vessels displayed minimal seasonality across the data period with a peak of an average of three unique vessels per day recorded in March to a low of one to two per day in January.

141. 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 Offloading (FPSO) and between Montrose and the Stella and Joanne fields. Routeing was also noted at the northern extreme of the Shipping and Navigation Study Area between Aberdeen and the Fulmar field. The majority of vessels routeing northwest-southeast through the centre of the Shipping and Navigation Study Area, and to the west of the MHPGC Project PEIR Red Line Boundary at the north were routeing between Aberdeen and oil and gas fields in the southern North Sea; primarily the Cygnus field.

142. Towards the south of the Shipping and Navigation Study Area vessels were also noted routeing between Blyth (UK) and offshore fields and ports in Scandinavia. Several vessels were also routeing northwest-southeast between many Scottish east coast ports and English and European ports. Several vessels were also recorded routeing to Sunderland across the data period.

143. On occasion oil and gas vessels were recorded anchoring or displaying waiting behaviours at the south of the Shipping and Navigation Study Area with anchoring further discussed in **Section 9.5**.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Type

- Oil and Gas



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.13: Oil and Gas Vessel Traffic Movements (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.4.6 Passenger vessels

144. An average of one to two unique passenger vessels per day were recorded across the data period. Passenger vessels displayed high levels of seasonality as illustrated in **Figure 9.14**. Passenger vessels were more prominent in the summer months with a peak of three to four per day recorded in July. Passenger vessels were noted in lower volumes across the winter and spring months, with a drop to an average of one unique vessels every two days in January. This seasonality is expected given the more favourable weather conditions and cruising schedules.

145. **Figure 9.15** presents the passenger vessels recorded within the Shipping and Navigation Study Area across the data period.

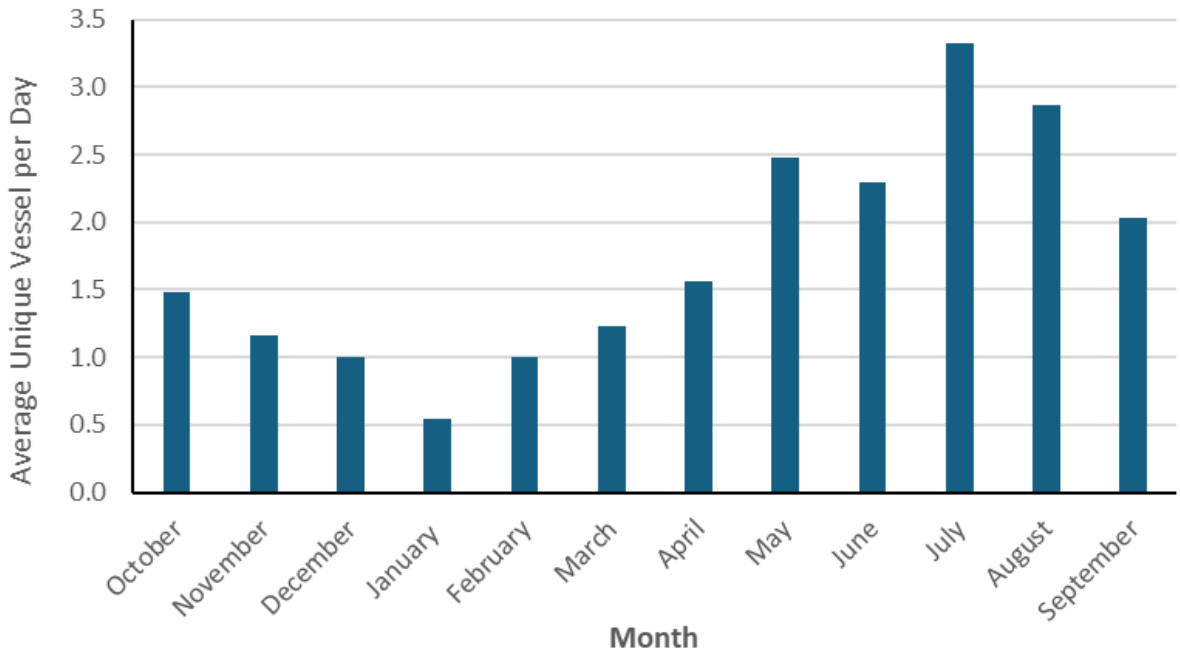


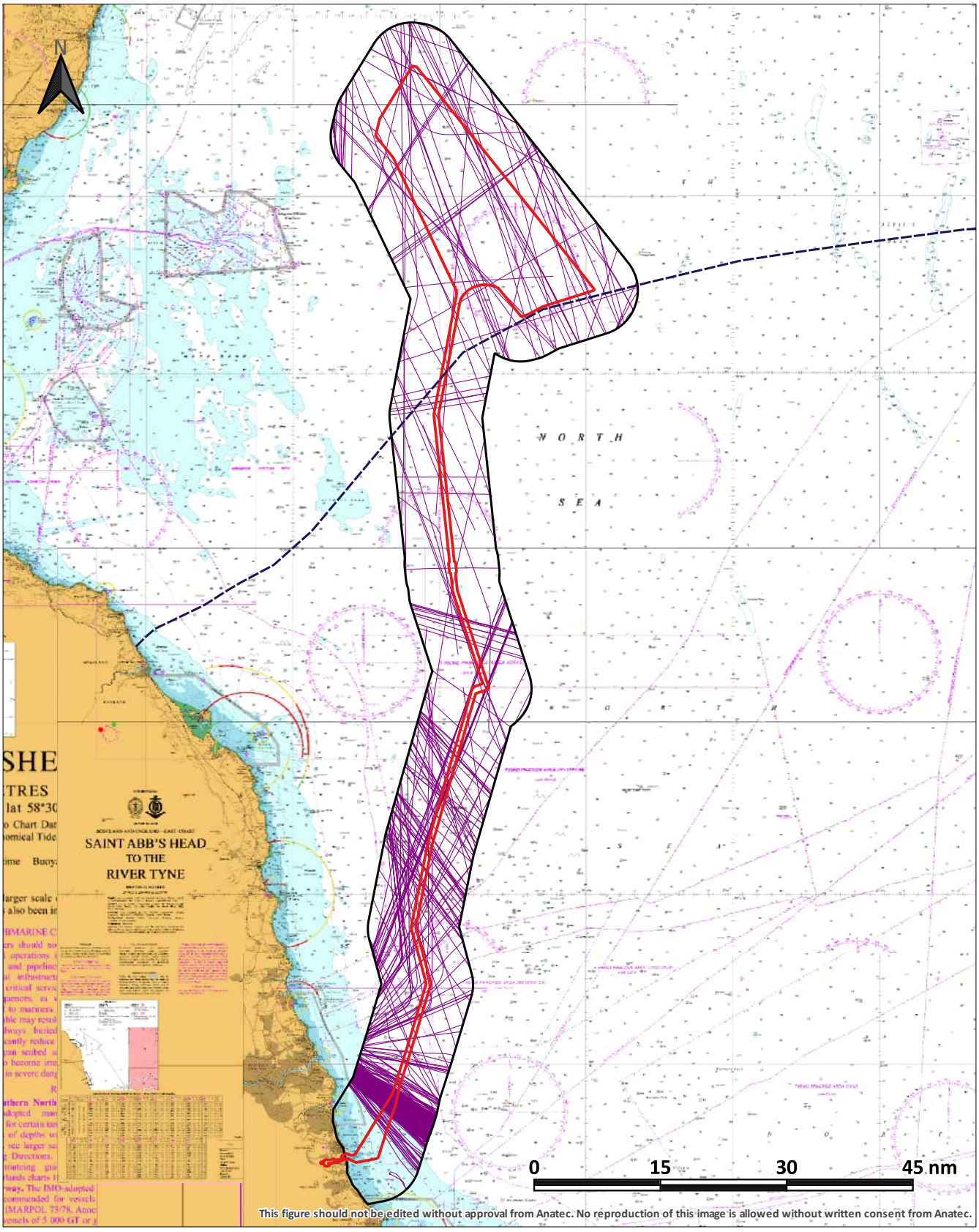
Figure 9.14: Daily average number of passenger vessels within Shipping and Navigation Study Area per month per vessel type (12 Months, 2024/25)

146. As for passenger vessel sub-type, Roll-On/Roll-Off passenger (RoPax) were the most common sub-type at 55% of all passenger vessels recorded. Cruise liners (37%) were also commonly recorded with large yachts (6%) and training vessels (2%) accounting for the remainder.

147. Two 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. A single transit was also made by a separate DFDS Seaways vessel between Aberdeen and Zeebrugge (Belgium) through the centre of the Shipping and Navigation Study Area. This transit occurred due to the vessel beginning a new charter after being in dry dock (Shippax, 2025b).

148. 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.

149. In addition to the peak of cruise liners in summer months, between 10 and 19 July 2025, passenger vessels inclusive of large yachts and sail training vessels were on route from Dunkirk (France) to Aberdeen as part of the Tall Ship Races (Sail Training International, 2025) and were recorded routeing north and northwest through the Shipping and Navigation Study Area.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Type

- Passenger



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.15: Passenger Vessel Traffic Movements (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.4.7 Recreational vessels

150. An average of one to two unique recreational vessels per day were recorded across the data period. Recreational vessels displayed high levels of seasonality as illustrated in **Figure 9.16**. Vessels were more prominent in the summer months with a peak of four to five unique recreational vessels per day recorded in June and July. Recreational vessels were noted in lower volumes across the winter months, with a drop to an average of one unique vessel recorded every 14 days in December and January. This seasonality is expected given the more favourable weather conditions. It is noted that recreational vessels are likely to be under-represented on AIS as recreational vessels are not required to broadcast on AIS, however it was noted by the RYA Scotland in consultation that the data was a good representation of activity (noting overall traffic volumes may be up to four times higher than recorded on AIS).

151. **Figure 9.17** presents the recreational vessels recorded within the Shipping and Navigation Study Area across the data period.

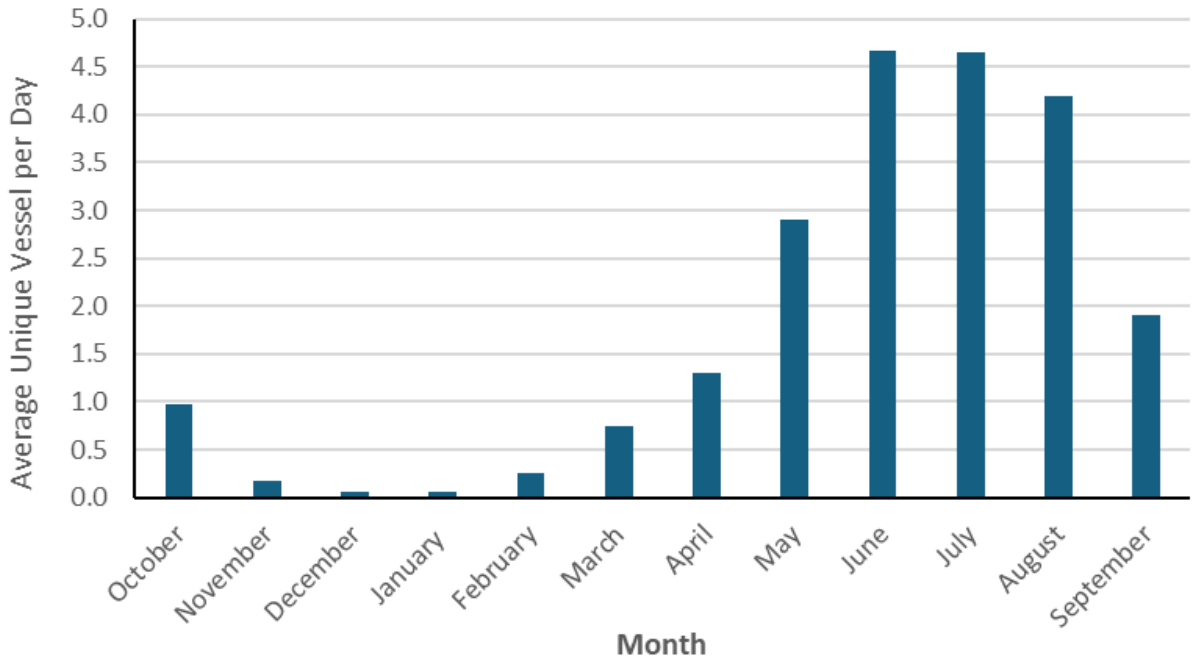
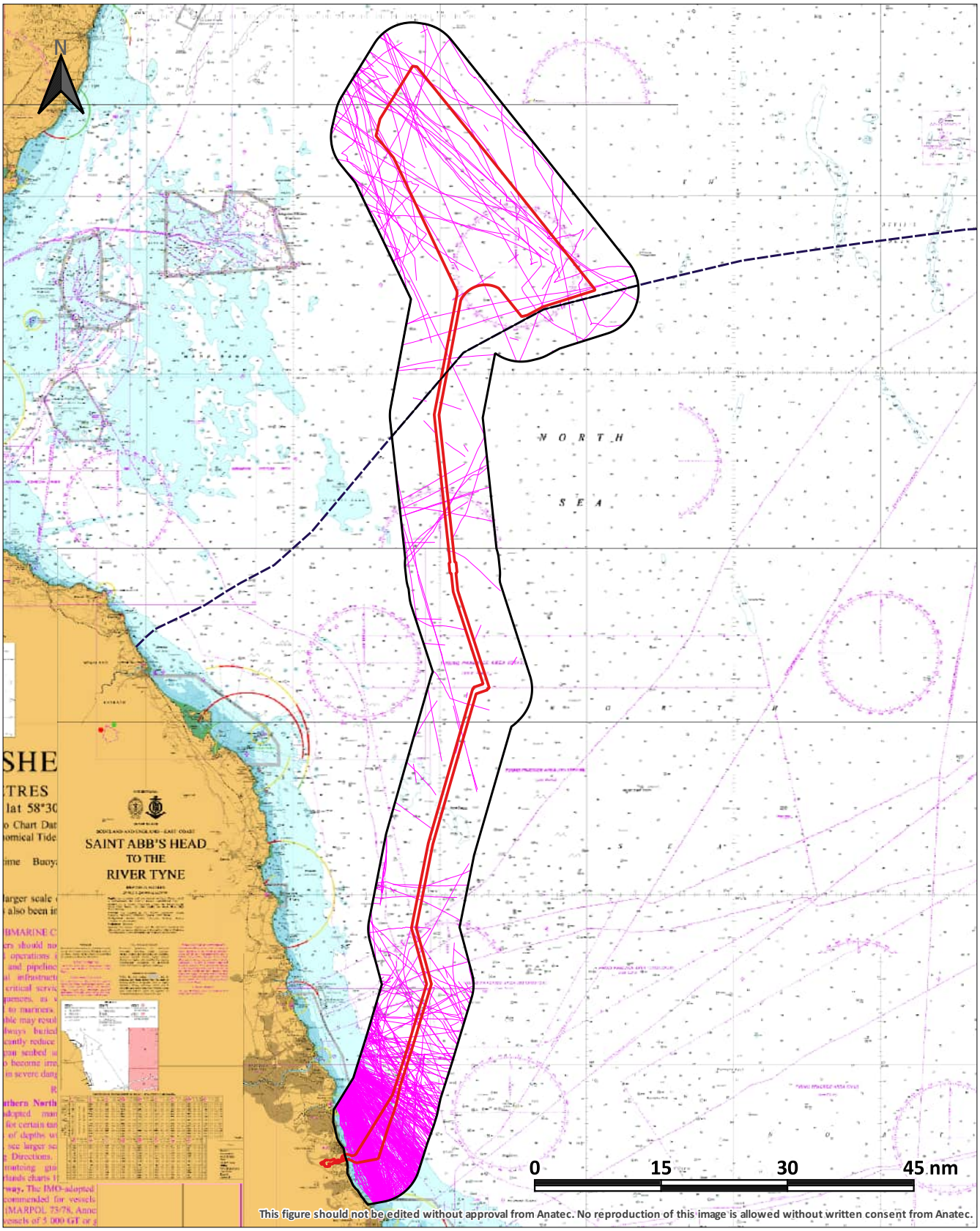


Figure 9.16: Daily average number of recreational vessels within Shipping and Navigation Study Area per month per vessel type (12 Months, 2024/25)

152. The majority of recreational vessels were recorded closer to the coast at the south of the Shipping and Navigation Study Area, 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.

153. 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. Some of these vessels were also partaking in the

Tall Ship Races previously mentioned in **Section 9.4.6**, routing to/from Aberdeen over the set days in July, aiding in the peak of recreational vessels recorded in the July during the data period.



Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Type

- Recreational



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.17: Recreational Vessel Traffic Movements (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

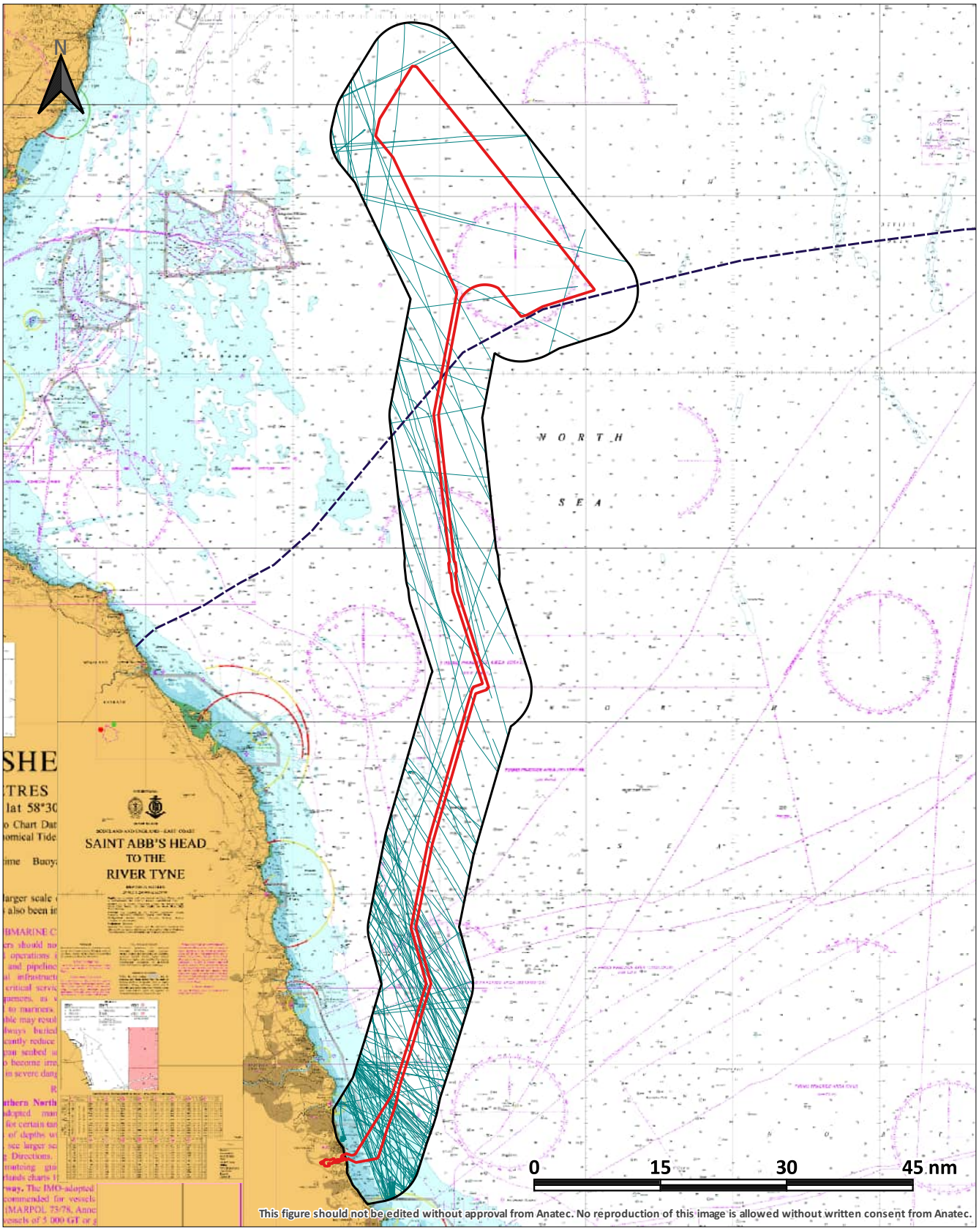
9.4.8 Wind farm vessels

154. **Figure 9.18** presents the wind farm vessels recorded within the Shipping and Navigation Study Area across the data period. As noted in **Section 9.1**, any wind farm vessels associated with under construction offshore wind farms have been removed from the analysis.

155. An average of one unique wind farm vessel every two days was recorded across the data period. Wind farm vessels displayed some seasonality with vessels more prominent in the summer months with a peak average of one unique wind farm vessel per day recorded in June, with a drop to an average of one unique vessel every six days in December.

156. 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.

157. 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.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Type

- Wind Farm



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 9.18: Wind Farm Vessel Traffic Movements (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.4.9 Dredgers/underwater operation vessels

158. **Figure 9.19** presents the dredger/underwater operation vessels recorded within the Shipping and Navigation Study Area across the data period, overlaid with the spoil grounds introduced in **Section 7.7**

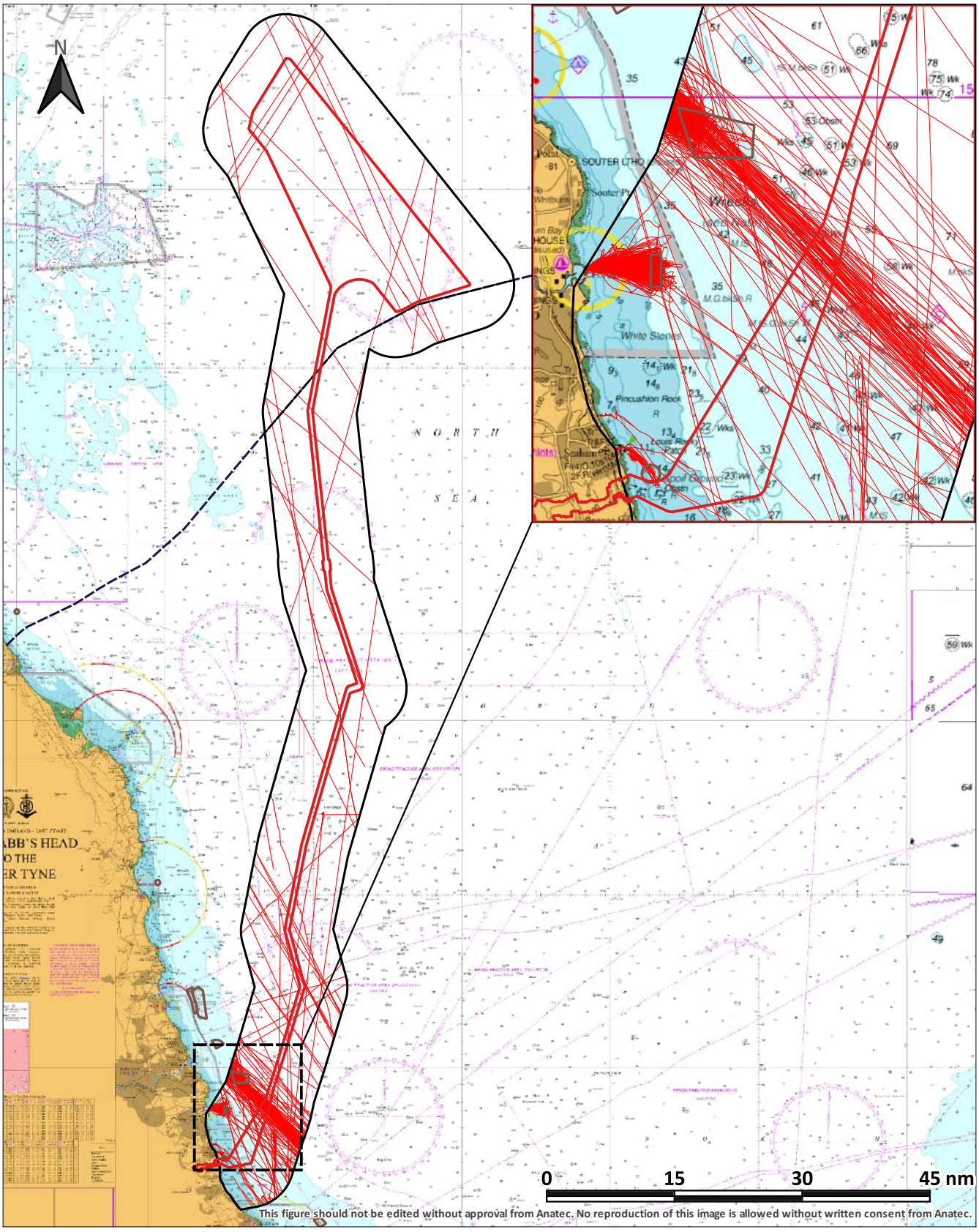
159. An average of one unique dredger/underwater operation vessel every one to two days was recorded across the data period. Dredger/underwater operation vessels displayed minor seasonality across the data period with a high peak recorded in July with an average of two unique vessels per day, the lowest vessels numbers recorded were in September with an average of one unique vessel every two days.

160. The peak in July was a result of a dredger being anchored within the south of the Shipping and Navigation Study Area, north of Seaham, for a period of 19 days.

161. 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.

162. Regular transits to and from the Port of Seaham and the Nose's Point spoil ground, which is located on the northern boundary of the MHPGC Project PEIR Red Line Boundary in English waters (approximately 0.4nm from the landfall location), were also recorded in November 2024.

163. Multiple vessels were recorded across the data period routeing northwest-southeast in the south of the Shipping and Navigation Study Area routeing between Tyne and licences aggregate areas to the southeast. Vessels were also noted on this route depositing at the spoil ground approximately 3nm offshore of Souter Point on the English east coast.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary
- Spoil Ground

Vessel Type

- Dredging or Underwater Ops



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 9.19: Dredgers/Underwater Operation Vessel Traffic Movements (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.5 Anchored vessels

164. Anchored vessels can be identified based upon the AIS navigational status which is programmed on the AIS transmitter on board a vessel. However, information is manually entered into the AIS, and therefore it is common for vessels not to update their navigational status if only at anchor for a short period of time.

165. For this reason, as an additional step, Anatec's "Speed Analysis" program was used to identify any vessels that may have been anchored despite not broadcasting as such over AIS; this program identifies any vessels that were travelling at a speed of below one knot for at least 30 minutes. The output of this program was manually reviewed and any additional cases of clear anchoring activity added to the result.

166. Following this, the vessel tracks of those vessels deemed to be at anchor within the Shipping and Navigation Study Area were isolated and are presented in **Figure 9.20**, colour-coded by vessel type. It is noted that no anchoring was identified in Scottish waters with all anchoring activity identified within the southern portion of the Shipping and Navigation Study Area in English waters and so this figure and following summary has been centred on this activity.

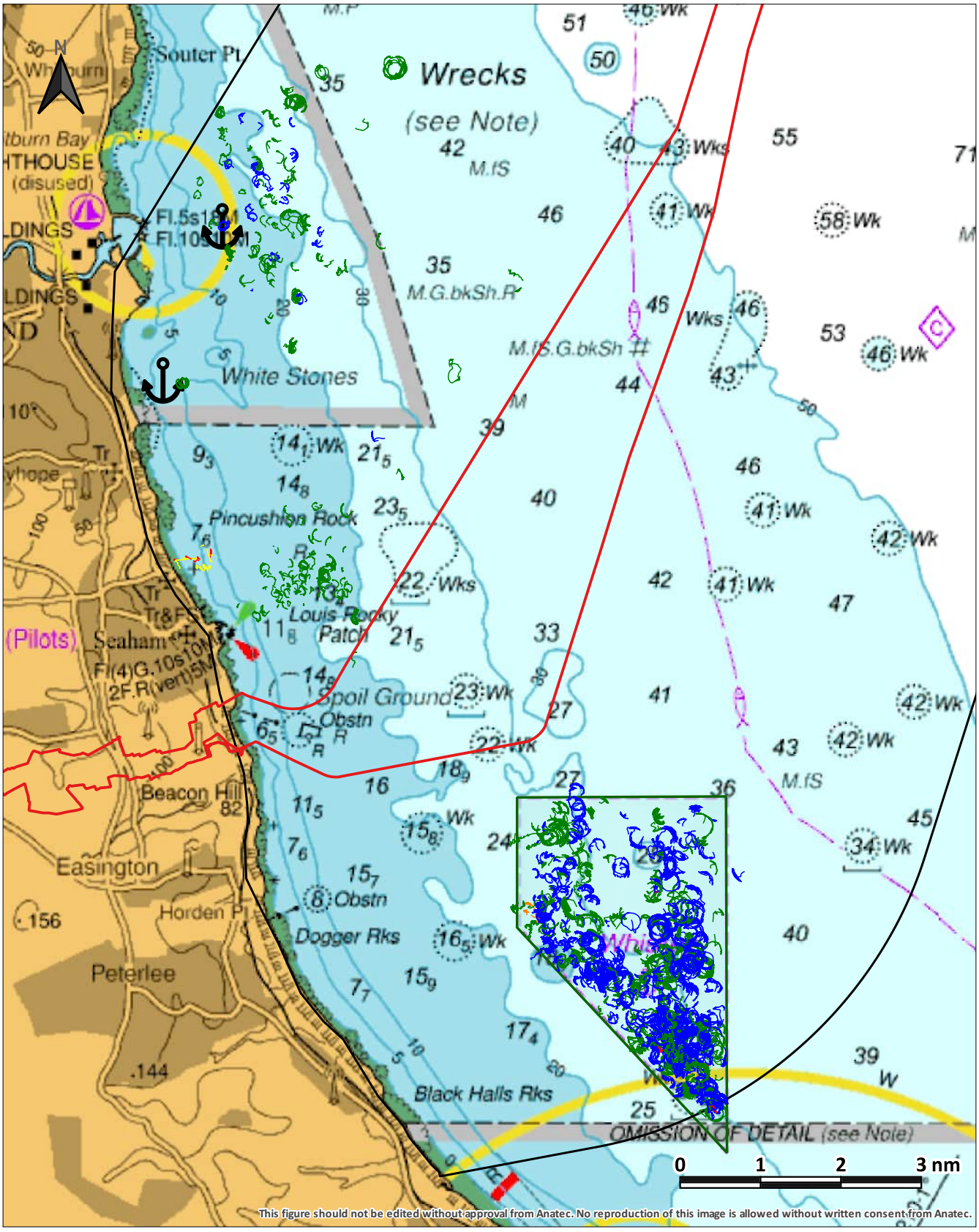
167. There was minimal seasonality with most instances of anchoring occurring in January and the least in April. As for vessel types, the most common vessels to anchor were tankers (53%) and cargo vessels (44%).

168. 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.

169. Cargo vessels and tankers were recorded at anchor on the approach to Sunderland at a charted anchoring location.

170. 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. A dredger and vessel classed as 'other' were recorded anchoring inshore, north of Seaham during July 2025.

171. 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.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- Anchorage Area
- Charted Anchorage

Vessel Type

- Dredging or Underwater Ops
- Passenger
- Cargo
- Tanker
- Other
- Oil and Gas



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 9.20: Anchored Vessels by Vessel Type (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.6 Vessel length

172. Vessel length was available for more than 99% of vessels recorded throughout the data period. Those vessels with unspecified vessel length were primarily recreational vessels or SAR vessels which were recorded on Class B. Subsequently, such vessels would likely be in the lowest vessel length category based on the requirements of AIS carriage [see **Section 6.1**]. These vessels with unspecified length have been removed from the analysis where relevant.

173. A distribution of vessel lengths across the data period is presented in **Figure 9.21**. Following this, vessel traffic movements are presented in **Figure 9.22**, colour-coded by vessel length.

174. Of vessels with a valid length, the average recorded was 91m. Vessel length ranged from 4m for a rescue daughter craft to 345m for a cruise liner routeing at the south of the Shipping and Navigation Study Area to Southampton (UK). The greatest range of vessel lengths was between 50m and 100m and mainly comprised of smaller commercial cargo, tanker and oil and gas vessels. Vessels with greater length were primarily cruise liners and tankers with those of smaller length including recreational, wind farm and fishing vessels.

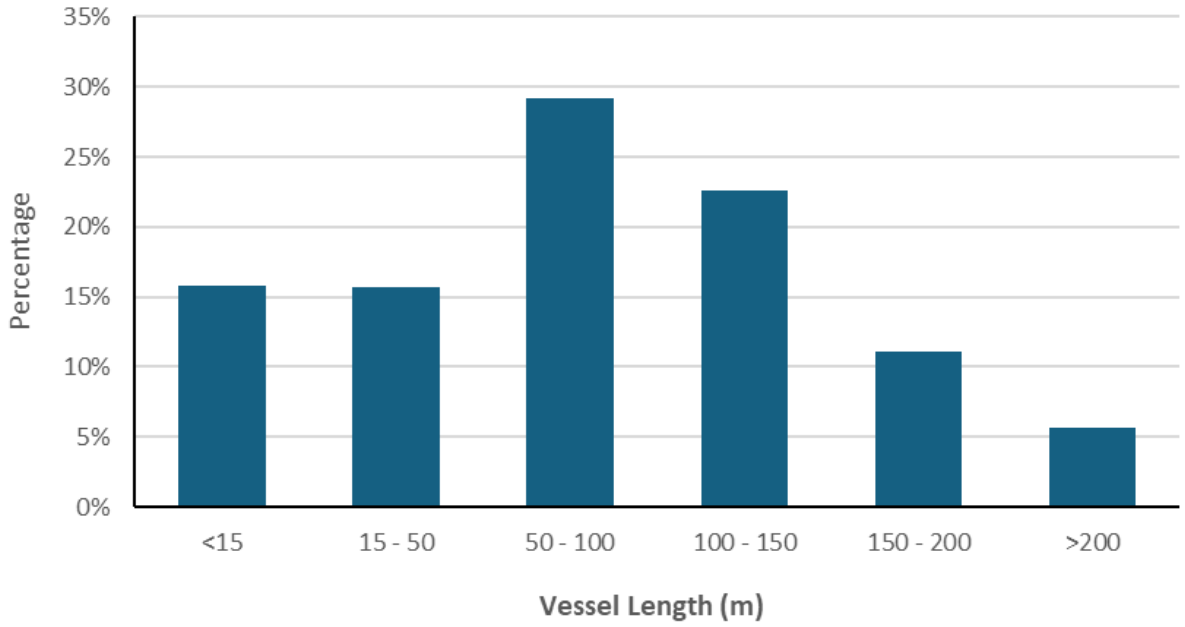
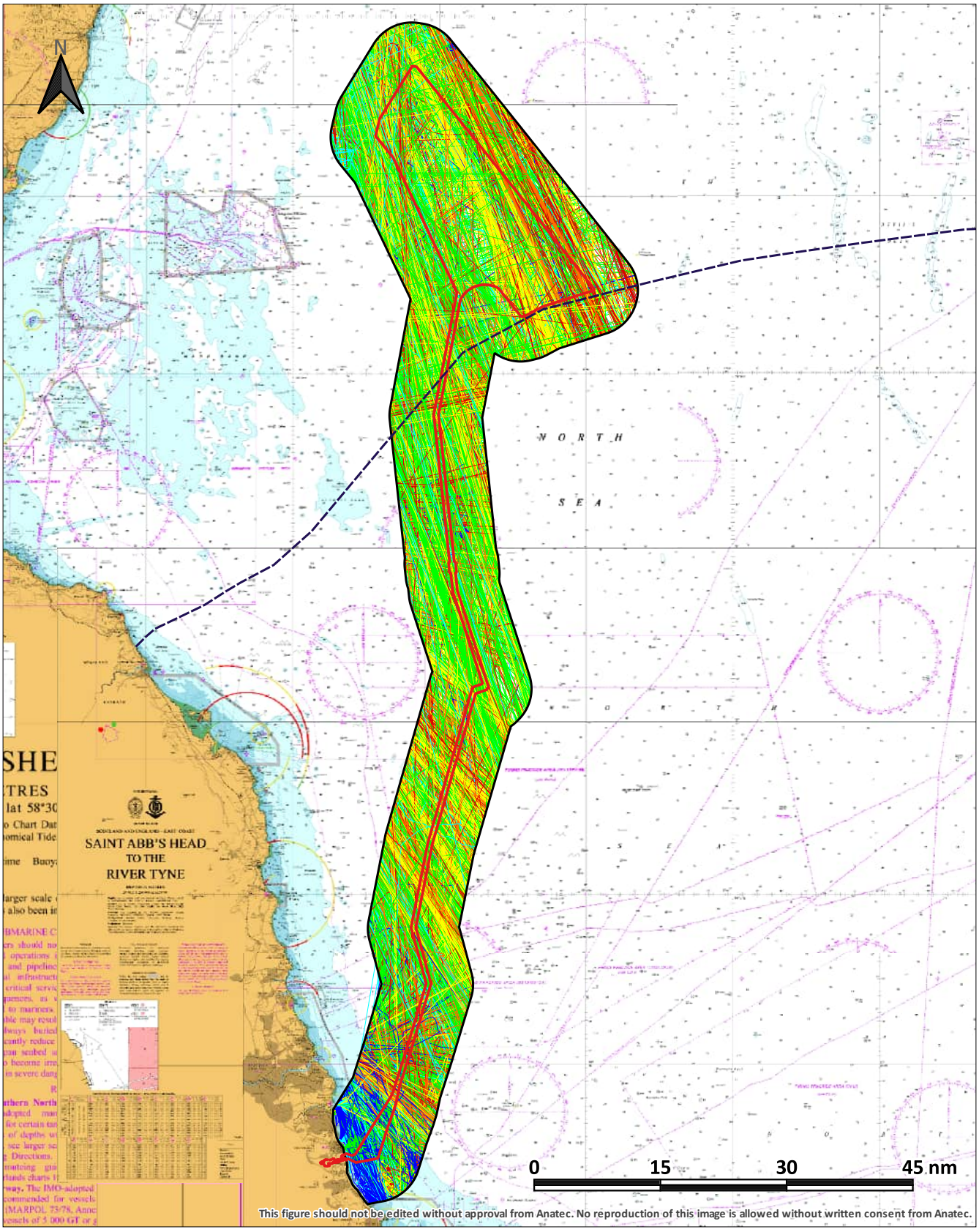


Figure 9.21: Vessel length distribution (12-Months, 2024/25)



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Length (m)

- Unspecified
- < 15
- 15 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- >= 200



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.22: Vessel Traffic Movements by Vessel Length (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

9.7 Vessel draught

175. Vessel draught was available for approximately 74% of all vessels recorded throughout the data period. Vessels with unspecified vessel draughts were primarily fishing vessels, recreational vessels or small craft classed as 'Other' vessel type including those carrying AIS Class B which does not include the broadcast of draught. Vessels with unspecified draughts have been removed from the analysis where relevant.

176. A distribution of vessel draughts recorded across the data period is presented in **Figure 9.23**. Following this, vessel traffic movements are presented in **Figure 9.24**, colour-coded by vessel draught.

177. Of vessels which broadcast a valid vessel draught, the average draught recorded was 5.6m. Vessel draught ranged from 0.2m for a fishing vessel to 20.6m for a crude oil tanker routeing across the centre of the Shipping and Navigation Study Area to Ningbo (China). The majority of vessels had a draught below 8m (88%) with the greatest range recorded between 4 and 6m. Vessels with a draught 10m and above accounted for only 2% and were larger cargo vessels and tankers.

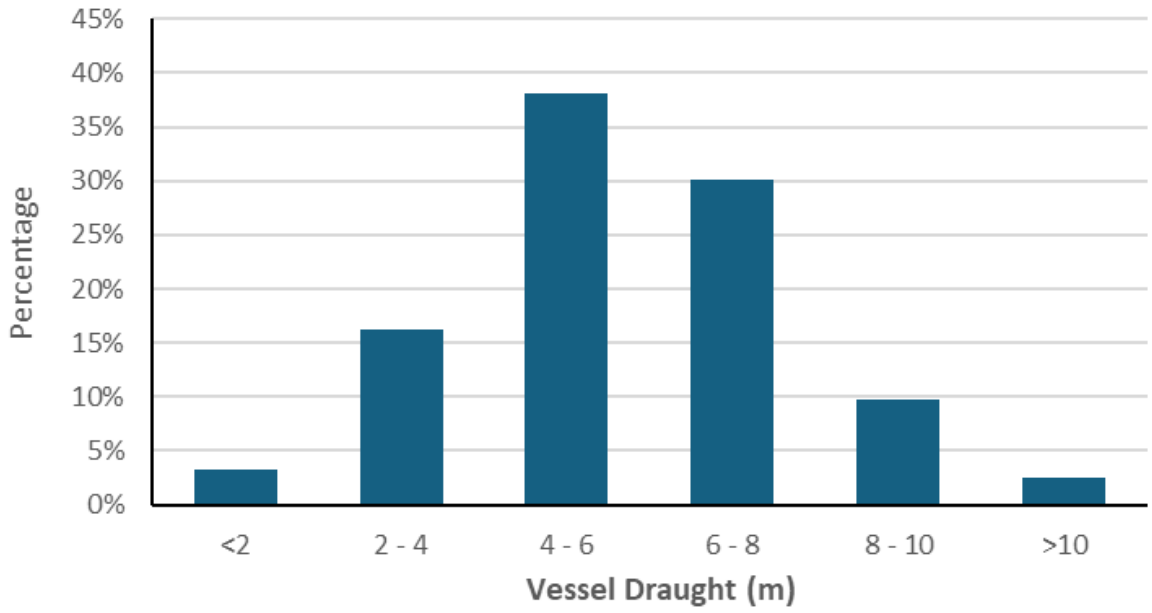
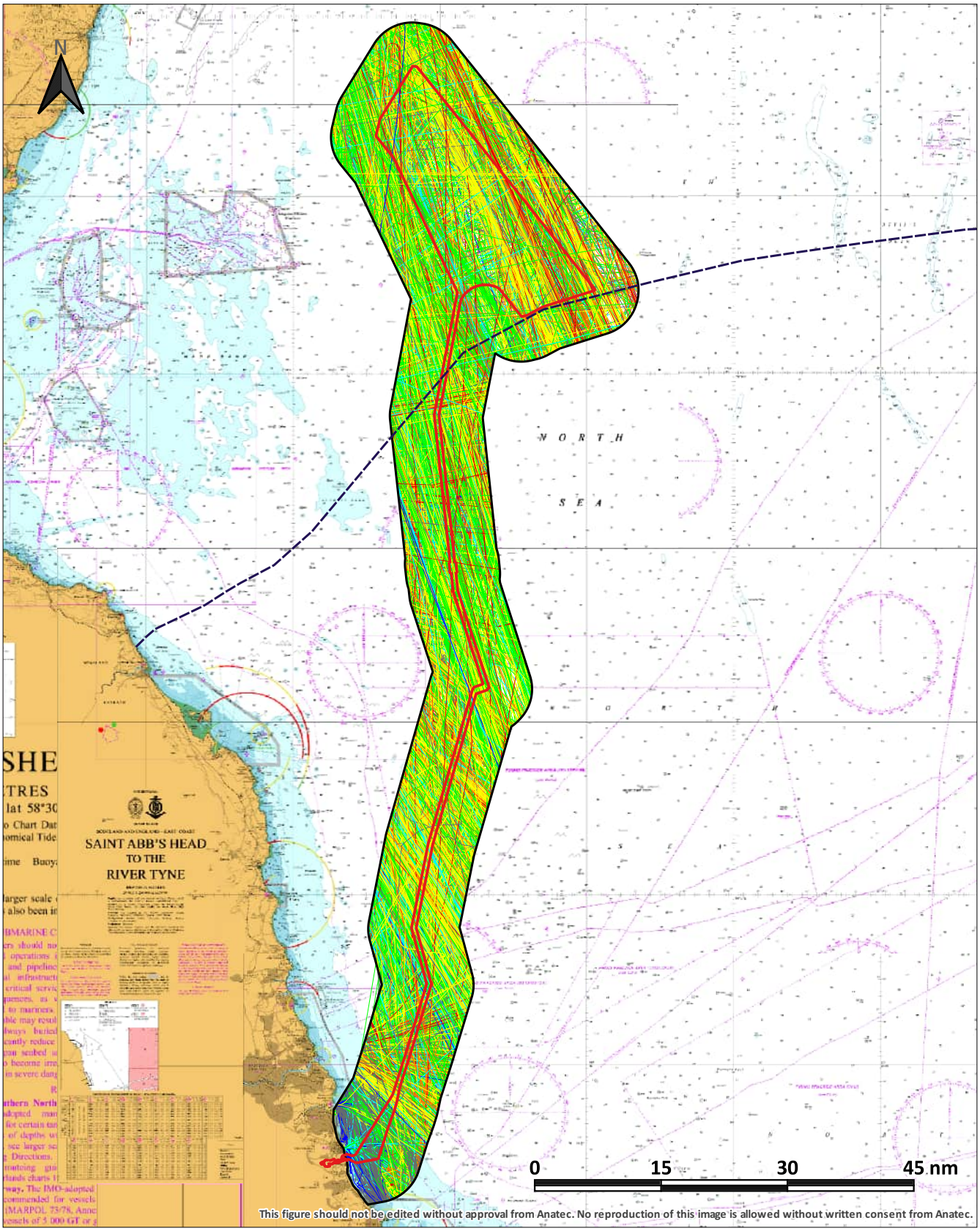


Figure 9.23 Vessel Draught Distribution (12-Months, 2024/25)



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Vessel Draught (m)

- Unspecified
- < 2
- 2 - 4
- 4 - 6
- 6 - 8
- 8 - 10
- >= 10



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Project	Figure Title	Date: 28/09/2026	Drawn: RR	Checked: JM
A5474 MHPGC Project NRA	Figure 9.24: Vessel Traffic Movements by Vessel Draught (12-Months, 2024/25)	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

10 Future baseline

178. This section presents an overview of potential changes to the shipping and navigation baseline over the 35-year lifetime of the MHPGC Project.

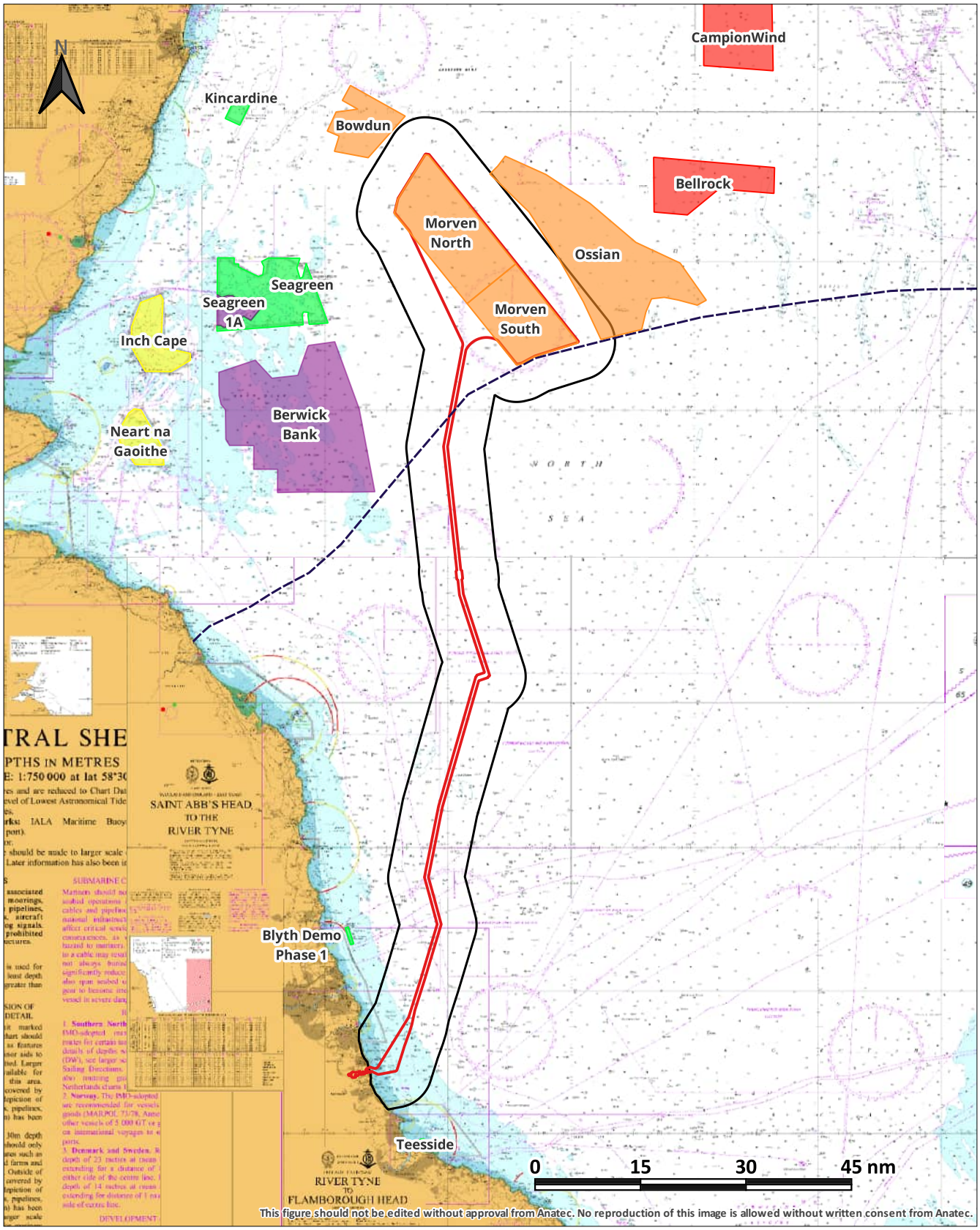
10.1 Offshore wind farms

179. **Figure 10.1** presents the locations of planned offshore wind farms which may become operational during the operational lifetime of the MHPGC Project.

180. This includes consented wind farms inshore of the MHPGC Project PEIR Red Line Boundary such as Berwick Bank and Seagreen 1A. Given these are inshore of the MHPGC Project PEIR Red Line Boundary, limited interaction with MHPGC Project vessels associated with these projects is anticipated. There is the possibility that Berwick Bank in particular may lead to changes to vessel traffic patterns in the future as vessels re-route to avoid the array.

181. Apart from Morven North and Morven South, which are contained within the MHPGC Project PEIR Red Line Boundary (the consent application for both of which has been submitted), the closest planned offshore wind farm to the MHPGC Project PEIR Red Line Boundary is Ossian (generation assets), which is currently under determination and is located approximately 3nm from the MHPGC Project PEIR Red Line Boundary at the closest point in Scottish waters. Given the location east of the MHPGC Project PEIR Red Line Boundary, project vessels associated with Ossian may pass through the Shipping and Navigation Area, increasing vessel numbers in Scottish waters in particular. Third-party vessels may also be deviated closer to the MHPGC Project PEIR Red Line Boundary as part of re-routeing to avoid the array.

182. The scoped Bowdun, Bellrock and CampionWind are also located within Scottish waters in proximity to the MHPGC Project PEIR Red Line Boundary and have the potential to alter vessel traffic patterns. Cumulative risk is assessed in **Section 15**.



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Legend

- MHPGC Project PEIR Red Line Boundary
- Shipping and Navigation Study Area
- English-Scottish Maritime Boundary

Offshore Wind Farm Phase

- Scoped
- Consent Application Submitted
- Consented
- Under Construction
- Operational



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 10.1: Planned Offshore Wind Farms	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

10.2 Oil and gas developments and decommissioning

183. Given the limited oil and gas infrastructure located in proximity to the MHPGC Project PEIR Red Line Boundary (see **Section 7.4**), 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 routeing of oil and gas vessels visiting installations, leading to crossing locations changing in the future.

10.3 Port trends and developments

184. There is potential for port developments to lead to changes to vessel types and volumes within the Shipping and Navigation Study Area. The most common destinations recorded on AIS are presented in **Figure 10.2**. It is noted that only valid destinations have been considered. Smaller ports and harbours in similar areas have been grouped together, as routeing to these is similar. For instance, Newcastle, the Port of Tyne and North and South Shields have been grouped as "Tyne", while "Tees and Hartlepool" includes Teesport, Hartlepool and the Port of Middlesbrough which is situated on the Tees.

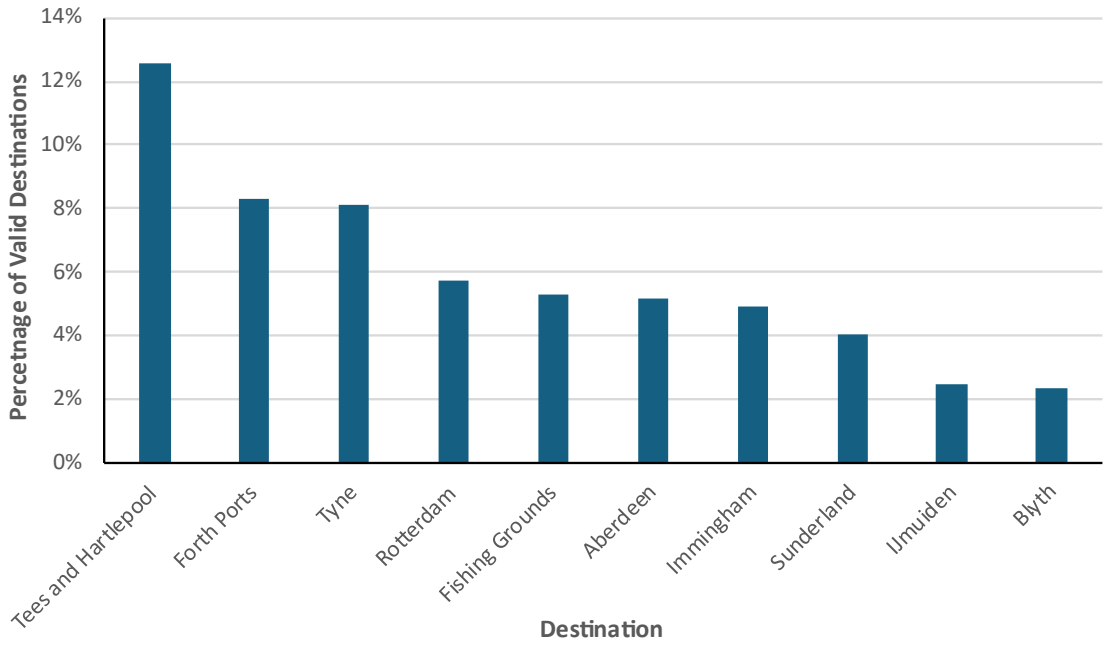


Figure 10.2: Most frequent destinations broadcast on AIS (12-Months, 2024/25)

185. The most frequent destination broadcast by vessels on AIS was Tees and Hartlepool, accounting for 13% of vessels, followed by Forth Ports and Tyne (both 8%). Other common destinations included major ports on the UK east coast, such as Sunderland, Immingham and Aberdeen, as well as major European ports such as Rotterdam and IJmuiden. Of these, Aberdeen and Forth Ports are located in Scottish waters, with Tees and Hartlepool, Tyne, Sunderland and Immingham located in English waters.

186. The following sections outline trends and major developments at some of the major ports among the most common destinations.

10.3.1 UK ports

187. **Figure 10.3** presents vessel arrivals at UK ports which were among the most common broadcast destinations on AIS, based on information from the DfT. It is noted that the data supplier changed in 2022, which may account for the significant drop in Aberdeen's vessel arrivals in 2022.

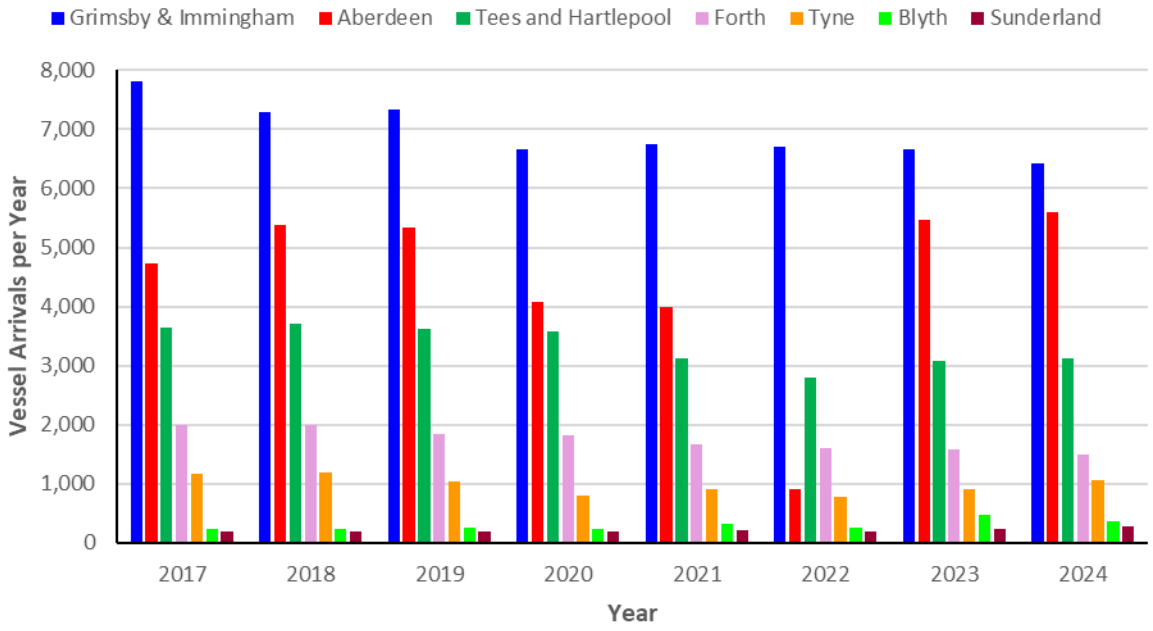


Figure 10.3: Port arrival statistics for main UK commercial vessel destinations (2017 to 2024)

188. Overall, arrivals at the six ports have slightly decreased over the period from 2017 to 2024, with a dip in overall arrivals in 2020 and 2021 associated with the COVID-19 pandemic. Within this there has been some variation at individual ports, with Aberdeen seeing an 18% increase in vessel arrivals, while Blyth and Sunderland reported increases of 53% and 43%, respectively. Tyne and Tees and Hartlepool both saw an overall decrease in arrivals, but it is noted that arrivals have been increasing in the years since COVID-19. Forth Ports and Grimsby and Immingham also saw a slight decline in arrivals, although arrivals have been mostly steady in more recent years.

189. The most notable expansion among the UK ports is the Immingham Green Energy Terminal, for which development consent was granted in February 2025 (The Planning Inspectorate, 2025b). This may alter the types and numbers of vessels, particularly tankers within the Shipping and Navigation Study Area.

190. In February 2025, the Port of Sunderland announced completion of expansion works which may lead to increased vessel activity in the future (Port of Sunderland, 2025). In 2023, the Port of Aberdeen opened the Aberdeen South Harbour (Port of Aberdeen, 2025), which offers additional deep water berths and therefore may increase the number of large vessels such as cruise liners and jack-ups able to visit the port.

10.3.2 Port of Rotterdam

191. **Figure 10.4** presents the throughput reported by the Port of Rotterdam between 2017 and 2024 (Port of Rotterdam Authority, 2025).

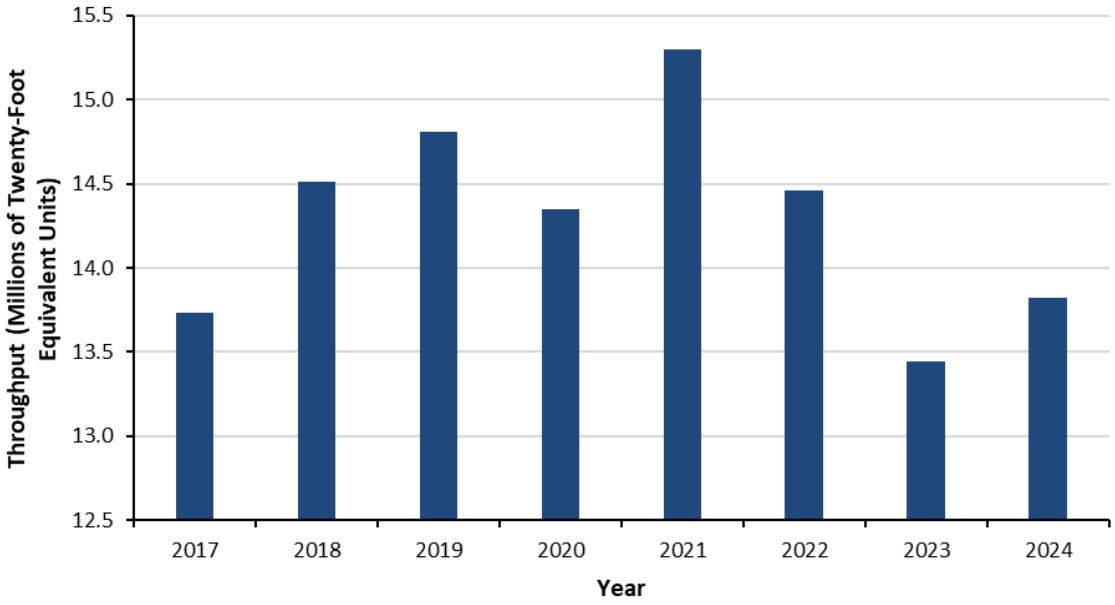


Figure 10.4: Port of Rotterdam throughput (2017 to 2024)

192. From 2017 to 2021, commercial throughput at Rotterdam showed a steady increase, noting a significant dip in 2020 associated with the COVID-19 pandemic. Since 2021, sanctions against Russia, geopolitical unrest and low economic growth have contributed to an overall decline in throughput, with throughput in 2024 similar to levels recorded in 2017. In recent years, a number of expansion projects have been ongoing at Rotterdam, including deep water quays to increase container throughput.

10.4 Fishing and recreational activity

193. Fishing vessels made up 20% of vessels recorded within the Shipping and Navigation Study Area, with a greater presence in English waters compared with Scottish waters. Trends relating to fishing activity are difficult to predict over 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 over the volume of fishing, gear types employed, and the nationality of fishing vessels.

194. Recreational vessels made up 4% of vessel traffic recorded within the Shipping and Navigation Study Area, again with a greater presence in English waters than Scottish, particularly close to the landfall. 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.

11 Hazards overview

195. The hazards considered within the assessment, based on the shipping and navigation baseline are outlined in **Table 11.1** as per Step 1 of the FSA process.

Table 11.1: Overview of hazards considered in the navigational risk assessment

Hazard	Phases assessed			Justification for phases not assessed
	C	O&M	D	
Increased vessel to vessel collision risk (MHPGC Project vessel to third-party)	✓	✓	✓	N/A
Increased vessel to vessel collision risk (third-party to third-party)	✓	✓	✓	N/A
Reduced access to local ports and harbours	✓	X	✓	As confirmed in the Planning Inspectorate Scoping Opinion, given the limited number of vessel movements during the O&M phase, minimal disruption to port access is foreseen, particularly considering MHPGC Project activities will be short-term and occur within a limited spatial extent.
Disruption to fishing and recreational activities	✓	X	✓	As confirmed in the Planning Inspectorate Scoping Opinion, given the limited number of vessel movements during the O&M phase, occurring in short time periods and in a limited spatial extent, minimal disruption to fishing and recreational activities are foreseen.
Disruption to third-party marine activities	✓	✓	✓	N/A
Reduction of under keel clearance	✓	✓	✓	N/A
Anchor interaction with subsea cables	✓	✓	✓	N/A
Fishing gear interaction with subsea cables	✓	✓	✓	N/A
Interference with navigation, communications and position fixing equipment	✓	✓	X	As confirmed in the Planning Inspectorate Scoping Opinion, during the decommissioning phase, the offshore export cables will not be energised, and therefore will not cause interference with navigational equipment. It is noted that the construction phase is included on the basis that periods of testing may occurring during this time whereby the offshore export cables will be energised.

12 Mitigation measures adopted as part of the MHPGC Project

12.1 Embedded mitigation

196. A number of embedded mitigation measures have been identified to reduce the risk to shipping and navigation users. These include industry standard measures, good practice and requirements that must be met to comply with existing legislation. The measures considered as embedded mitigation measures are presented in **Table 12.1**.

Table 12.1: Embedded mitigation measures

Commitment number	Mitigation measure	Description	How and where secured
CoT08	Cable Specification and Installation Plan	An Outline Offshore Cable Specification and Installation Plan (CSIP) will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. 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 Deeps 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.	The CSIP will be secured through the relevant conditions of the Deemed Marine Licence (dML) and marine licence(s).
CoT04	Promulgation of information	Advance warning will be provided via Notice to Mariners to ensure that the appropriate authorities are informed of offshore construction, operation and	Included within the Navigational Safety Plan (NSP), which will be secured through the

Commitment number	Mitigation measure	Description	How and where secured
		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.	relevant conditions of the dML and marine licence.
CoT19	Appointment of a Fisheries Liaison Officer (FLO)	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)	Included within the Outline Fisheries Liaison and Coexistence Plan, which will be secured via dML condition.
CoT32	Advisory safe passing distances	An Advisory Safety Statement to define advisory safe passing distance and use of guard vessels, will be submitted as part of the application for development consent and as part of the marine licence application(s) to the Scottish Ministers.	Secured through the relevant conditions of the marine licence.
CoT31	Lighting and marking	MHPGC Project vessels will display appropriate marks and lights at all times, and broadcast their navigational status on AIS, particularly when RAM.	Included in the Outline Vessel Traffic Management Plan, which will be secured through the relevant conditions of the dML and marine licence.
CoT30	Marine coordination	An Outline Vessel Traffic Management Plan (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 in line with the Outline VTMP, and in accordance 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	Included in the Outline OEMP, which will be secured through the relevant conditions of the dML and marine licence.

Commitment number	Mitigation measure	Description	How and where secured
		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.	
CoT37	Marine Pollution Contingency Plan (MPCP)	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 and as part of the marine licence application(s) to the Scottish Ministers. 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 Mean High Water Springs (MHWS),and will include all essential emergency contacts and information. A Detailed MPCP will be developed substantially in accordance with the Outline MPCP.	The MPCP will be secured through the relevant conditions of the dML and marine licence.
CoT28	NSP	An Outline NSP 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. It will detail measures to ensure compliance with international marine regulations, in addition to outlining safe passing distances requested by MHPGC Project vessels, and the use of guard	Included in the Outline OEMP, which will be secured through the relevant conditions of the dML and marine licence.

Commitment number	Mitigation measure	Description	How and where secured
		vessels. A Detailed NSP will be developed in accordance with the outline plan.	
CoT52	Compliance with MGN 654	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 GLA (Trinity House in English waters, NLB 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.	Compliance with MGN 654 will be secured as an offshore safety management condition as part of the DCO and Marine Licence. Compliance with water depth reduction limits will be secured as part of the CSIP.
CoT06	OEMP	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 Marine Pollution Contingency Plan; ▪ An Outline Marine Mammal Mitigation Protocol; ▪ An Outline Vessel Traffic Management Plan; ▪ 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;	The Outline OEMP will be secured through the relevant conditions of the dML and marine licence.

Commitment number	Mitigation measure	Description	How and where secured
		▪ 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.	
CoT44	Offshore Decommissioning Programme	An Offshore Decommissioning Programme will be developed and submitted to the MMO and MD-LOT prior to commencement of any offshore. It will be in line with the latest relevant legislation and available guidance at the time of production, as far as reasonably practicable.	The Offshore Decommissioning Programme will be secured through the relevant conditions of the dML and marine licence.
CoT53	Compass deviation study	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).	Secured through the relevant conditions of the dML and marine licence.

12.2 Additional mitigation

197. Based on the risk assessment undertaken in **Section 13** and the cumulative risk assessment undertaken in **Section 15**, no additional mitigation is proposed, i.e., the embedded mitigation measures outlined in **Section 12** are considered sufficient to ensure the significance of risk associated with all hazards is within ALARP parameters.

13 Risk assessment

198. This section presents assessment of the hazards identified in **Section 11**, forming Step 2 of the FSA process.

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

13.1.1 Construction phase

199. 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 CLV/Cable Lay Barge (CLB), 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.

200. The construction phase is expected to last up to four years. There will be a number of activities taking place within the construction phase, 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 at the exit pit due to trenchless technologies.

13.1.1.1 Frequency of occurrence

201. 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. 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. 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.

202. Measures in place to mitigate risk of collision are listed in **Table 12.1**, including a number of measures aimed to increase awareness of ongoing works, such as marking and lighting, MHPGC Project vessels broadcasting on AIS (CoT31), and promulgation of information (CoT04). These measures will ensure vessels are aware of the works ongoing and can appropriately passage plan.

203. All MHPGC Project vessels will comply with Flag State Regulations including adhering to SOLAS and the COLREGs (CoT30). 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. MHPGC Project vessels engaged in construction works will also request safe passing distances from third-party vessels, in order to minimise the likelihood of encounters and potential collision scenarios occurring (CoT32).

204. 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**.

205. 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**.

13.1.1.2 Severity of consequence

206. 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. Pollution events would be managed via the MPCP (CoT37).

207. 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.

208. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

13.1.1.3 Significance of Risk

209. In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable**.

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

13.1.2 O&M phase

211. 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 guard vessels relating to survey activities.

13.1.2.1 Frequency of Occurrence

212. 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 on a campaign basis as required. 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.

213. As per the construction phase, promulgation of information will be a key mitigation to ensure third-party vessels are aware of ongoing works during the O&M phase (CoT04). MHPGC Project vessels undertaking O&M phase activities will broadcast on

AIS, with appropriate navigational status, and will adhere to Flag State Regulations, including SOLAS and the COLREGs (CoT30). Where identified as necessary, guard vessels will also be deployed (CoT32). Local ports and harbours would also be contacted where O&M phase activities are in proximity (CoT30).

214. The frequency of occurrence in both Scottish and English waters is considered to be **extremely unlikely**.

13.1.2.2 Severity of Consequence

215. As per the construction phase, the severity of consequence is considered to be **moderate** for both Scottish and English waters.

13.1.2.3 Significance of Risk

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

13.1.3 Decommissioning phase

217. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan (CoT44). However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 13.1.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

13.1.3.1 Significance of Risk

218. In Scottish waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable**.

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

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

13.2.1 Construction phase

220. The presence of MHPGC Project vessels may also lead to an increase in collision risk between third-party vessels. Construction phase activities will involve CLVs and jack-ups, which are large, slow-moving vessels which are 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.

221. The construction phase is expected to last up to four years. There will be a number of stages of activity within the construction phase, 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, works will be mobile along the length of the MHPGC Project PEIR Red Line Boundary, with the exception of the landfall where works may take longer at the exit pit due to trenchless technologies.

13.2.1.1 Frequency of occurrence

222. 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. 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. 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.

223. Throughout the construction phase, the movements of MHPGC Project vessels will be managed via marine coordination (CoT30) and will display appropriate marks and lights. MHPGC Project vessels will also broadcast on AIS, including an appropriate navigational status, particularly those vessels which are RAM (CoT31). 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.

224. Promulgation of information will also ensure vessels are aware of the works ongoing and will include use of NtMs, as well as targeted information provided to local ports and harbours (CoT04).

225. In Scottish waters, the landfall works are not relevant, while traffic volumes and other navigational constraints are also less significant. Given these factors alongside

the lesser extent of the construction activities, it is anticipated the frequency of occurrence in Scottish waters is **negligible**.

226. 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**.

13.2.1.2 Severity of consequence

227. The most likely consequences of a collision between two third-party vessels 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, PLL and pollution. Smaller craft may be more likely to founder in the event of a collision, as these are likely to have weaker structural integrity than a larger vessel. In the event of pollution, environmental damage would be managed via the MPCP (CoT37).

228. 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 vessels.

229. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

13.2.1.3 Significance of risk

230. 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**.

231. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable.**

13.2.2 O&M phase

232. 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.

233. Similarly to the construction phase, key mitigation measures 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. Guard vessels may also be deployed where deemed necessary.

13.2.2.1 Frequency of occurrence

234. 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 on a campaign basis as required. 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 repairs 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.

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

236. The frequency of occurrence in both Scottish and English waters is considered to be **negligible**.

13.2.2.2 Severity of consequence

237. As per the construction phase, the severity of consequence is considered to be **moderate** for both Scottish and English waters.

13.2.2.3 Significance of risk

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

13.2.3 Decommissioning phase

239. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan (CoT44). However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 13.2.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

13.2.3.1 Significance of risk

240. 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**.

241. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable.**

13.3 Reduced access to local ports and harbours

13.3.1 Construction phase

242. The presence of MHPGC Project vessels engaged in construction phase 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 the 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 directly affected, being located approximately 0.9nm north of the 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.

243. 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, including jack-ups and CLVs, 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.

244. The Port of Seaham may have a greater reduction in access than other ports due to the proximity to the landfall, however approaches to Seaham from the south along the coast are not commonly recorded on AIS, and therefore the 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 9**, 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 prior to and 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 (as secured through the OEMP, see CoT30 in Section 12).

245. During consultation undertaken to inform the NRA (presented in **Section 5.2**), neither Seaham nor Sunderland expressed any concern over port access, with Sunderland noting that adequate navigational warnings should be sufficient mitigation. Navigational warnings will be issued as part of promulgation of information regarding upcoming and ongoing works (as secured through the NSP, see CoT04 in Section 12).

13.3.1.1 Frequency of occurrence

246. Key mitigation measures relating to port and harbour access will be promulgation of information, to ensure that vessels accessing Seaham are informed of works and able to carry out suitable passage planning. This can be undertaken via NtMs, as well as liaison directly with the Port of Seaham (as secured through the OEMP, see CoT04 in Section 12). In addition, vessels engaged in construction activities will broadcast on AIS (CoT32), with appropriate navigational status, and will adhere to all Flag State Regulations (CoT30). These mitigation measures will be secured through the Advisory Safety Statement and NSP, see Section 12.

247. 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**.

248. Within English waters, it is expected that the reduction in access will be greatest at the Port of Seaham, when cable lay crosses the 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 a highly localised area at any one time. However, at landfall, works may take longer given the implementation of trenchless technologies. The frequency of occurrence in English waters is considered to be **reasonably probable**.

13.3.1.2 Severity of consequence

249. 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. There are no commercial ferries that operate out of the Port of Seaham.

250. The severity of consequence is considered to be **minor** for both Scottish and English waters.

13.3.1.3 Significance of risk

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

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

13.3.2 Decommissioning phase

253. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan (CoT44). However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 13.3.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

13.3.2.1 Significance of risk

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

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

13.4 Disruption to fishing and recreational activities

13.4.1 Construction phase

256. 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 hazard 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.

257. Construction phase activities will be mobile along the length of the MHPGC Project PEIR Red Line Boundary, therefore disruption in any one location will be short-term,

and affect a limited spatial extent. The exception to this is at the landfall, where works may be present for a more extended period.

258. 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 throughout this risk assessment.

13.4.2 Decommissioning phase

259. As per the construction 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.**

13.5 Disruption to third-party marine activities

13.5.1 Construction phase

260. Similarly to the hazard 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, an RAF firing practice area. 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.

261. 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 the 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.

13.5.1.1 Frequency of occurrence

262. Information on construction phase activities will be promulgated via a number of means, including NtMs, which will allow third-party operators to plan appropriately

(CoT04). Construction vessels will also broadcast on AIS, display appropriate marks and lights (CoT31), and will follow all Flag State Regulations (CoT30). 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.

263. Given the lack of third-party marine activities within Scottish waters, the frequency of occurrence in Scottish waters is considered to be **negligible**.

264. 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**.

13.5.1.2 Severity of consequence

265. 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** for both Scottish and English waters.

13.5.1.3 Significance of risk

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

267. In English waters, the frequency of occurrence is considered to be remote, and the severity of consequence is minor. Therefore, the significance of risk is considered to be **broadly acceptable**.

13.5.2 O&M phase

268. 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 on the northern edge of the MHPGC Project PEIR Red Line Boundary close to the 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.

269. 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.

13.5.2.1 Frequency of occurrence

270. Given the lack of third-party marine activities within Scottish waters, the frequency of occurrence in Scottish waters is considered to be **negligible**.

271. 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**.

13.5.2.2 Severity of consequence

272. 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** for both Scottish and English waters.

13.5.2.3 Significance of risk

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

274. In English waters, the frequency of occurrence is considered to be extremely unlikely, and the severity of consequence is minor. Therefore, the significance of risk is considered to be **broadly acceptable**.

13.5.3 Decommissioning phase

275. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan (CoT44). However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 13.5.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

13.5.3.1 Significance of risk

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

277. In English waters, the frequency of occurrence is considered to be remote, and the severity of consequence is minor. Therefore, the significance of risk is considered to be **broadly acceptable**.

13.6 Reduction of under keel clearance

13.6.1 Construction phase

278. 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 depth cannot be achieved, as informed by the CBRA (CoT08). 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.

279. External protection is anticipated to be required along up to 10.69% of the offshore export cable corridor between the OSP and the trenchless drill exit point, with a height of up to 2m. This corresponds to a total length of 35,070m 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 chart datum (CD), indicating that under keel clearance will not be adversely affected.

280. 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.

281. 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 (CoT52). 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 the landfall and trenchless drill exit pits.

282. At the landfall, trenchless techniques will be utilised, meaning that there will be no water depth reduction where this is used. The exit pit is expected to be approximately 360m to 1,660m offshore, in water depths of a minimum 4m. 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.

13.6.1.1 Frequency of occurrence

283. 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). Guard vessels will also be deployed where deemed necessary via a risk assessment to increase vessel awareness (CoT32).

284. 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**.

285. 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, given the use of trenchless techniques for cable installation at landfall, 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**.

13.6.1.2 Severity of consequence

286. 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.

287. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

13.6.1.3 Significance of Risk

288. In Scottish water, the frequency of occurrence is negligible and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable**.

289. In English water, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable**.

13.6.2 O&M phase

290. As per the construction phase, the presence of the offshore export cables and external 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.

291. 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).

292. At landfall, trenchless techniques will be utilised, meaning that there will be no water depth reduction where this is used. The exit pits are expected to be approximately 360m to 1,660m offshore, in water depths of a minimum 4m. 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.

13.6.2.1 Frequency of occurrence

293. 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**.

294. 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 (CoT08). The frequency of occurrence in English waters is considered to be **extremely unlikely**.

13.6.2.2 Severity of consequence

295. 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 are reduced given the shallow waters are also closest to the coast, and therefore in closer proximity to emergency response resources.

296. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

13.6.2.3 Significance of risk

297. 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**.

298. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable**.

13.6.3 Decommissioning phase

299. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan (CoT44). If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 13.6.2**], including in relation to spatial and temporal extent, likelihood and potential consequences.

13.6.3.1 Significance of risk

300. 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**.

301. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable**.

13.7 Anchor interaction with subsea cables

13.7.1 Construction phase

302. 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.

303. 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.

304. 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 5.2), the Port of Seaham indicated that anchor dragging was uncommon in the area off Seaham, but that there had been instances.

305. Incident data from both the RNLI and MAIB reviewed in **Section 8** 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.

306. 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 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). 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.

307. During the construction phase, the offshore export cables may be unburied following cable lay or may 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.

13.7.1.1 Frequency of occurrence

308. Promulgation of information as secured in the NSP 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). Guard vessels 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).

309. 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**.

310. During the construction phase, it is noted that there may be a period where some or all of the cable is exposed while awaiting burial or protection works. During this time there may be greater risk of interaction, however the deployment of guard vessels (as secured in the Advisory Safety Statement) and promulgation of information (as secured in the NSP) are expected to discourage anchoring in proximity to the offshore export cables. The frequency of occurrence in English waters is considered to be **remote**.

13.7.1.2 Severity of consequence

311. 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.

312. 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).

313. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

13.7.1.3 Significance of risk

314. 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**.

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

13.7.2 O&M phase

316. 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.

317. Once laid, the key mitigation 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.

13.7.2.1 Frequency of occurrence

318. The offshore export cables will also be depicted on UKHO Admiralty Charts, which will inform any decision to anchor as part of good seamanship . An accompanying warning regarding anchoring, trawling and other seabed operations will be included on the charts (CoT04). Rule 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.

319. Throughout the O&M phase, up to eight surveys per year will be undertaken to ensure the burial and protection remain in place as part of the monitoring programme.

320. 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**.

321. 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**.

13.7.2.2 Severity of consequence

322. 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.

323. 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.

324. 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).

325. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

13.7.2.3 Significance of risk

326. 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**.

327. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable**.

13.7.3 Decommissioning phase

328. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan (CoT44). If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 13.7.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

13.7.3.1 Significance of risk

329. 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**.

330. In English waters, the frequency of occurrence is extremely unlikely and the severity of consequence is moderate. Therefore, the significance of risk is considered to be **broadly acceptable**.

13.8 Fishing gear interaction with subsea cables

13.8.1 Construction phase

331. Similarly to the hazard 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.

13.8.1.1 Frequency of occurrence

332. 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. Minimisation of the time between cable lay and burial will limit the exposure time on the seabed prior to burial or protection measures being in place.

333. Promulgation of information is expected to discourage fishing activity in the vicinity of the offshore export cables (CoT04). It is, however, the responsibility of fishers to use this information as part of their own risk assessment of where to fish. Commercial issues relating to fishing activity are considered in **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR.** Guard vessels 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). An FLO will also be appointed to liaise with the fishing industry, further aiding awareness (CoT19).

334. 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**.

335. 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. Mitigation measures such as the deployment of guard vessels, 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**.

13.8.1.2 Severity of consequence

336. 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.

337. The severity of consequence is therefore considered to be **moderate** for both Scottish and English waters.

13.8.1.3 Significance of risk

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

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

13.8.2 O&M phase

340. As per the construction phase, there will be a risk of fishing gear interaction with the offshore export cables during the O&M phase.

341. Once laid, the offshore export cables will be marked on UKHO Admiralty Charts, with an associated note regarding trawling, anchoring or seabed operations (CoT04). 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.

13.8.2.1 Frequency of Occurrence

342. The cable protection, informed by the findings of the CBRA, will provide appropriate mitigation against fishing gear snagging (CoT08). This, alongside depiction on charts and promulgation of information is expected to discourage fishing activity in the vicinity of the offshore export cables. It is, however, the responsibility of fishers to use this information as part of their own risk assessment of where to fish.

Commercial issues relating to fishing activity are considered in **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR**.

343. While monitoring will be carried out regularly to ensure protection measures remain in place, if the mobility of the seabed leads to cable exposures, there will be greater risk of fishing gear interaction where the cables are exposed.

344. 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**.

345. 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**.

13.8.2.2 Severity of consequence

346. 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.

347. The severity of consequence is therefore considered to be **moderate** for both Scottish and English waters.

13.8.2.3 Significance of risk

348. In Scottish waters, the frequency of occurrence is considered to be negligible, and the severity of consequence is moderate, therefore the significance of risk is expected to be **broadly acceptable**.

349. In English waters, the frequency of occurrence is considered to be extremely unlikely, and the severity of consequence is moderate, therefore the significance of risk is expected to be **broadly acceptable**.

13.8.3 Decommissioning phase

350. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the

Offshore Decommissioning Plan (CoT44). If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 13.8.2**], including in relation to spatial and temporal extent, likelihood and potential consequences.

13.8.3.1 Significance of risk

351. In Scottish waters, the frequency of occurrence is considered to be negligible, and the severity of consequence is moderate, therefore the significance of risk is expected to be **broadly acceptable**.

352. In English waters, the frequency of occurrence is considered to be extremely unlikely, and the severity of consequence is moderate, therefore the significance of risk is expected to be **broadly acceptable**.

13.9 Interference with navigation, communications and position-fixing equipment

13.9.1 Construction phase

353. 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.

354. 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 required to confirm conformity with the stated limits.

355. EMF effects on magnetic compasses are affected by spacing of the offshore export cables, water depth, the presence of burial or protection measures 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.

356. 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.

357. CoT53 outlines the following: 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). Frequency of occurrence

358. This hazard will only occur whilst the offshore export cables are energised and this will be limited to during periods of testing. Therefore, the frequency is anticipated to be relatively low.

359. Additionally, as noted previously, the majority of vessels, particularly commercial vessels, do not rely on magnetic compasses as their primary means of navigation. It is considered unlikely that the offshore export cables will have a significant impact on vessel navigation for these vessels. For smaller craft, there may be a greater reliance on magnetic compasses, however the effect will be extremely localised to where vessels are passing over the offshore export cables in shallow waters. Vessels in shallow coastal waters should also be able to visually navigate, where conditions allow.

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

361. 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 the 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**.

13.9.1.1 Severity of consequence

13.9.1.2 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.

362. The severity of consequence is therefore considered to be **minor** for both Scottish and English waters.

13.9.1.3 Significance of risk

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

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

13.9.2 O&M phase

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

13.9.2.1 Frequency of occurrence

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

367. 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 the 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**.

13.9.2.2 Severity of consequence

13.9.2.3 As per the construction phase, 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.

368. The severity of consequence is therefore considered to be **minor** for both Scottish and English waters.

13.9.2.4 Significance of risk

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

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

14 Cumulative screening

371. A screening exercise has been undertaken to identify projects and plans to be taken forward to the cumulative risk assessment, as outlined in **Section 4.4**.

372. The projects and plans considered to have the potential to cause cumulative hazards relevant to shipping and navigation are presented in **Table 14.1**. It is noted that projects greater than 10nm from the MHPGC Project PEIR Red Line Boundary have been screened out of the cumulative risk assessment. Similarly, the Round 6 Area of Search A1, the E4L6 cable and Germany-UK Hybrid Interconnector cables have been screened out due to low data confidence. Following this, **Figure 14.1** presents the locations of the projects and plans, where information is publicly available. The locations of the Eastern Green Link (EGL) 1 to 5 cable projects has been based on published information from Kingfisher Bulletins on survey and route preparation works.

Table 14.1 Cumulative projects and plans screened in for shipping and navigation

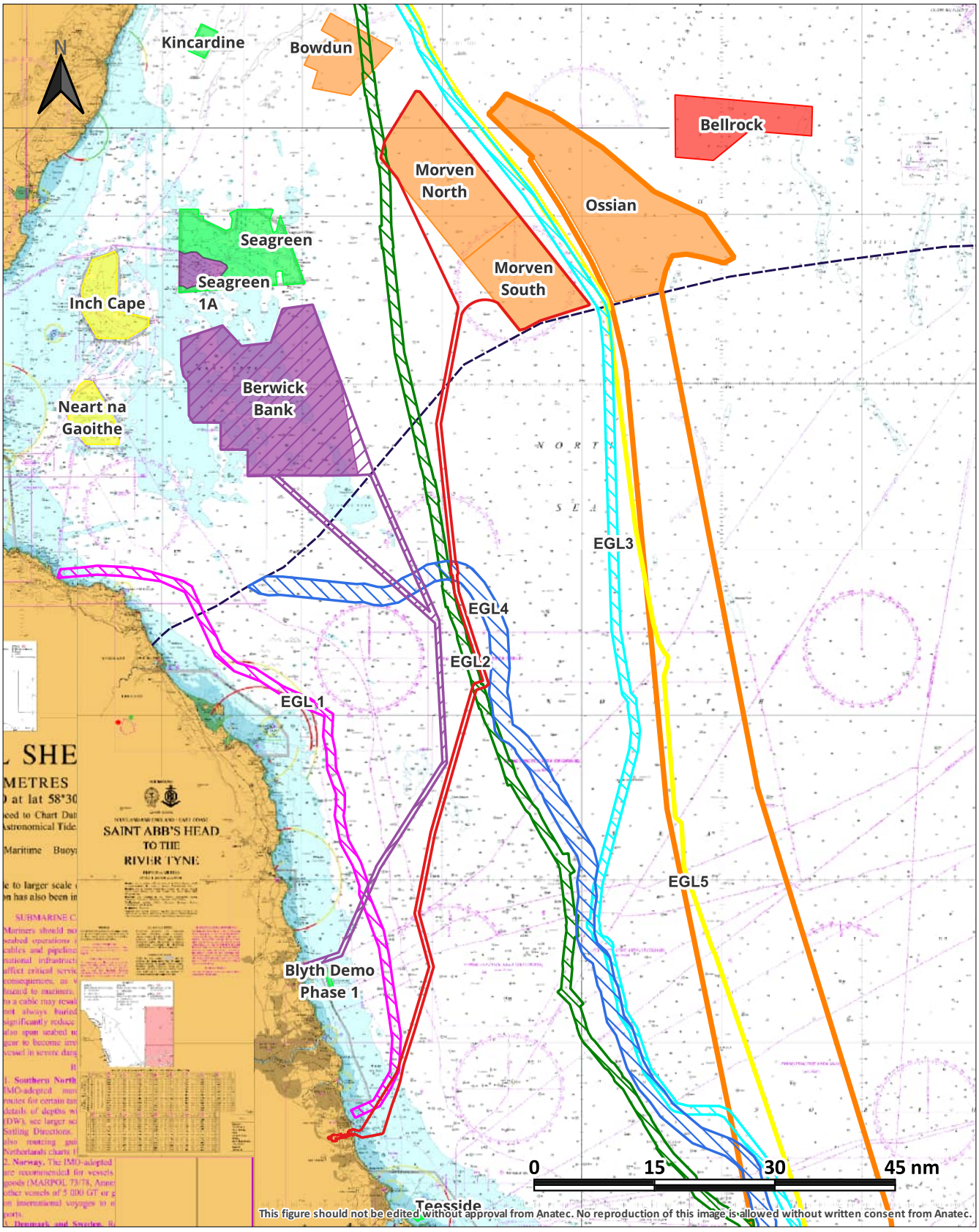
Project/plan	Type of Development	Tier	Status	Distance from MHPGC Project (km/nm)	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Morven North	OWF and associated cables	1	Application submitted/awaiting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

Project/plan	Type of Development	Tier	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
					associated with the Berwick Bank Offshore Wind Farm			operational phases of MHPGC Project.
Ossian	OWF and associated cables	1	Application submitted, awaiting decision	5.50km/2.97nm	Proposed for up to 265 floating turbines and up to 15 offshore substation platforms	2031 to 2034	2034-2069	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.
Bowdun OWF	OWF and associated cables	1	Application submitted, awaiting decision	10.03km/5.41nm	Up to 67 wind turbines, up to three offshore substation platforms and up to three export cables	2031 to 2034	2034-2069	Yes. Overlap of construction phase or operational phase with the construction or operational phases of MHPGC Project.

Project/plan	Type of Development	Tier	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
Berwick Bank	OWF and associated cables	1	Consented	18.22km/9.84nm	Up to 307 wind turbines, ten offshore substation platforms and eight offshore export cables	2028 to 2031	2013-2066	Yes. Overlap of operational phase with the construction or operational phases of MHPGC Project.
EGL1	Subsea Cable	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.
EGL2	Subsea Cable	1	Under construction	0.00km/0.00nm	Power cable running from Peterhead to Drax	2026 to 2029	2029 onwards	Yes. Potential for operational phase to interact with the construction or operational phases of MHPGC Project.

Project/plan	Type of Development	Tier	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
EGL3 subsea cable	Subsea Cable	2	Scoping report published	2.33km/1.26nm	2 GW HVDC link between Fife and King's Lynn	2027 to 2033	2034 onwards	Yes. Potential for construction phase or operational phase to interact with the construction or operational phases of MHPGC Project.
EGL4 subsea cable	Subsea Cable	2	Scoping report published	0.00km/0.00nm	2 GW HVDC link between Fife and Lincolnshire	2028 to 2032	2032 onwards	Yes. Potential for construction phase or operational phase to interact with the construction or operational phases of MHPGC Project.
MBAGC Project	OWF export cable	3	Pre-application	0.00km/0.00nm	Potential transmission for Morven	Unknown	Unknown	Unknown. Construction, O&M and

Project/plan	Type of Development	Tier	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
					North or Morven South			decommissioning phases may overlap with MHPGC Project construction, O&M and decommissioning phases.
EGL 5 subsea cable	Subsea Cable	3	Pre-application	1.25km/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.



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Legend

- MHPGC Project PEIR Red Line Boundary
- English-Scottish Maritime Boundary
- Ossian Transmission Scoping Boundary

Offshore Wind Farm Phase

- Scoped
- Consent Application Submitted
- Consented
- Under Construction
- Operational

- Berwick Bank Cambois Connection

EGL Cable Corridors

- EGL1
- EGL2
- EGL3
- EGL4
- EGL5



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Project	Figure Title	Date: 28/09/2026	Drawn: LD	Checked: JM
A5474 MHPGC Project NRA	Figure 14.1: Projects and Plans Screened in for Shipping and Navigation	Coordinate System: WGS 84 / World Mercator (EPSG:3395)		

15 Cumulative risk assessment

373. This section presents the cumulative risk assessment, following the methodology outlined in **Section 4.4**. The four scenarios assessed are reiterated below:

- Scenario 1: MHPGC Project and Morven North;
- Scenario 2: MHPGC Project and Morven South;
- Scenario 3: MHPGC Project, Morven North, Morven South and MBAGC Project;
- Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC).

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

374. 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.

375. 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.

15.1.1 Scenario one and two

15.1.1.1 Construction phase

376. 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.

377. 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.

378. Overall, the frequency of occurrence and severity of consequence are not considered to change compared with the MHPGC Project alone assessment presented in **Section 13.1.1**.

Frequency of occurrence

379. In Scottish waters, the frequency of occurrence is considered to be **extremely unlikely**.

380. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

381. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

382. 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**.

383. 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**.

15.1.1.2 O&M phase

384. 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 in **Section 13.1.2**.

Frequency of occurrence

385. The frequency of occurrence in both Scottish and English waters is considered to be **extremely unlikely**.

Severity of consequence

386. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

387. 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**.

15.1.1.3 Decommissioning phase

388. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the

Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.1.1.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

389. In Scottish waters, the frequency of occurrence is considered to be **extremely unlikely**.

390. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

391. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

392. 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**.

393. 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**.

15.1.2 Scenario three

394. 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 in **Section 15.1.1**.

15.1.2.1 Construction phase

Frequency of occurrence

395. In Scottish waters, the frequency of occurrence is considered to be **extremely unlikely**.

396. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

397. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

398. 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**.

399. 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**.

15.1.2.2 O&M phase

400. 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 presented in **Section 15.1.1**.

Frequency of occurrence

401. The frequency of occurrence in both Scottish and English waters is considered to be **extremely unlikely**.

Severity of consequence

402. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

403. 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**.

15.1.2.3 Decommissioning phase

404. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.1.2.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

405. In Scottish waters, the frequency of occurrence is considered to be **extremely unlikely**.

406. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

407. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

408. 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**.

409. 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**.

15.1.3 Scenario four

15.1.3.1 Construction phase

410. 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.

411. 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.

412. 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.

413. Overall, the frequency of occurrence and severity of consequence are not considered to change compared with the MHPGC Project alone assessment presented in **Section 13.1.1**.

Frequency of occurrence

414. In Scottish waters, it is anticipated the frequency of occurrence is **extremely unlikely**.

415. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

416. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

417. 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**.

418. 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**.

15.1.3.2 O&M phase

419. 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 13.2.2**.

Frequency of occurrence

420. The frequency of occurrence in both Scottish and English waters is considered to be **extremely unlikely**.

Severity of consequence

421. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

422. 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**.

15.1.3.3 Decommissioning phase

423. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.1.3.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

424. In Scottish waters, it is anticipated the frequency of occurrence is **extremely unlikely**.

425. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

426. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

427. 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**.

428. 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**.

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

429. 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.

430. 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.

15.2.1 Scenario one and two

15.2.1.1 Construction phase

431. 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.

432. 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. 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.

433. Overall, the frequency of occurrence and severity of consequence are not considered to change compared with the MHPGC Project alone assessment presented in **Section 13.2.1**.

Frequency of occurrence

434. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

435. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

436. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

437. 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**.

438. 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**.

15.2.1.2 O&M phase

439. 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 13.2.2**.

Frequency of occurrence

440. The frequency of occurrence in both Scottish and English waters is considered to be **negligible**.

Severity of consequence

441. The severity of consequence is considered to be **moderate** for both Scottish and English waters**.**

Significance of effect

442. In both Scottish and English 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**.

15.2.1.3 Decommissioning phase

443. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.2.1.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

444. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

445. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

446. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

447. 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**.

448. 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**.

15.2.2 Scenario three

449. 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 the whole project assessment presented in **Section 15.2.1.** Likewise, the presence of the MBAGC Project is not anticipated to influence the collision risk noting the low associated data confidence.

15.2.2.1 Construction phase

Frequency of occurrence

450. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

451. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

452. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

453. 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**.

454. 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**.

15.2.2.2 O&M phase

455. 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 whole project assessment presented in **Section 15.2.1.**

Frequency of occurrence

456. The frequency of occurrence in both Scottish and English waters is considered to be **negligible**.

Severity of consequence

457. The severity of consequence is considered to be **moderate** for both Scottish and English waters**.**

Significance of effect

458. In both Scottish and English 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**.

15.2.2.3 Decommissioning phase

459. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.2.2.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

460. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

461. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

462. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

463. 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**.

464. 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**.

15.2.3 Scenario four

15.2.3.1 Construction phase

465. 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 the previous impact, 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.

466. 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 cable 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.

467. Overall, the frequency of occurrence and severity of consequence are not considered to change compared with the MHPGC Project alone assessment presented in **Section 13.2.1**.

Frequency of occurrence

468. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

469. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

470. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

471. 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**.

472. 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**.

15.2.3.2 O&M phase

473. 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.

Frequency of occurrence

474. The frequency of occurrence in both Scottish and English waters is considered to be **negligible**.

Severity of consequence

475. The severity of consequence is considered to be **moderate** for both Scottish and English waters**.**

Significance of effect

476. In both Scottish and English 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**.

15.2.3.3 Decommissioning phase

477. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.2.3.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

478. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

479. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

480. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

481. 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**.

482. 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**.

15.3 Reduced access to local ports and harbours

483. 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.

484. 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.

15.3.1 Scenario one and two

15.3.1.1 Construction phase

485. Given the distance from Morven North or Morven South to any of the ports and harbours considered within MHPGC Project alone assessment in **Section 13.3**, it is not anticipated that there is any change to the frequency or severity of the impact compared to that identified in the MHPGC Project alone assessment in Section 13.3.

Frequency of occurrence

486. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

487. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

488. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

489. 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**.

490. 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**.

15.3.1.2 Decommissioning phase

491. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.3.1.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

492. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

493. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

494. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

495. 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**.

496. 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**.

15.3.2 Scenario three

15.3.2.1 Construction phase

497. As per the whole project assessment presented in **Section 15.3.1**, 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 13.3**. Likewise, the presence of the MBAGC Project is not anticipated to influence the level of port access noting the low associated data confidence.

Frequency of occurrence

498. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

499. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

500. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

501. 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**.

502. 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**.

15.3.2.2 Decommissioning phase

503. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.3.2.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

504. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

505. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

506. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

507. 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**.

508. 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**.

15.3.3 Scenario four

15.3.3.1 Construction phase

509. 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 total 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 (as secured under the VTMP), along with suitable promulgation of information on planned and ongoing works (as secured under the NSP), should ensure that vessel access is not reduced beyond the findings of the MHPGC Project assessment presented in **Section 13.3**.

510. 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.

Frequency of occurrence

511. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

512. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

513. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

514. 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**.

515. 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**.

15.3.3.2 Decommissioning phase

516. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.3.3.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

517. In Scottish waters, the frequency of occurrence is considered to be **negligible**.

518. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

519. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

520. 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**.

521. 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**.

15.4 Disruption to fishing and recreational activities

522. 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.

15.5 Disruption to third-party marine activities

523. 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.

524. 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.

15.5.1 Scenario one and two

15.5.1.1 Construction phase

525. 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 close to the 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 13.5** for the MHPGC Project alone.

Frequency of occurrence

526. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

527. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

528. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

529. 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**.

530. 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**.

15.5.1.2 O&M phase

531. 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 13.5**.

Frequency of occurrence

532. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

533. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

534. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

535. 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**.

536. 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**.

15.5.1.3 Decommissioning phase

537. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.5.1.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

538. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

539. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

540. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

541. 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**.

542. 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**.

15.5.2 Scenario three

543. 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 13.5**. 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. Therefore, the significance of the effect is as per the whole project assessment in **Section 15.5.1**.

15.5.2.1 Construction phase

Frequency of occurrence

544. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

545. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

546. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

547. 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**.

548. 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**.

15.5.2.2 O&M phase

Frequency of occurrence

549. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

550. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

551. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

552. 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**.

553. 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**.

15.5.2.3 Decommissioning phase

554. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.5.2.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

555. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

556. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

557. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

558. 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**.

559. 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**.

15.5.3 Scenario four

15.5.3.1 Construction phase

560. Dredgers 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 low 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 13.5**.

Frequency of occurrence

561. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

562. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

563. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

564. 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**.

565. 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**.

15.5.3.2 O&M phase

Frequency of occurrence

566. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

567. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

568. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

569. 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**.

570. 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**.

15.5.3.3 Decommissioning phase

571. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan. However, the decommissioning phase activities are likely to be similar to the construction phase activities, and therefore the hazard is anticipated to be similar in nature to that of the equivalent construction phase hazard [see **Section 15.5.3.1**], including in relation to spatial and temporal extent, likelihood and potential consequences.

Frequency of occurrence

572. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

573. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

574. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

575. 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**.

576. 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**.

15.6 Reduction of under keel clearance

577. There may be increased risk of reduced under keel clearance if additional crossings with other subsea infrastructure are required, noting that contingency numbers of crossings have been included within the maximum design scenario. 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.

578. 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.

15.6.1 Scenario one and two

15.6.1.1 Construction phase

579. 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 13.6**.

Frequency of occurrence

580. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

581. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

582. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

583. 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.**

584. 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**.

15.6.1.2 O&M phase

585. 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 13.6**.

Frequency of occurrence

586. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

587. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

588. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

589. 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.**

590. 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**.

15.6.1.3 Decommissioning phase

591. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.6.1.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

592. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

593. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

594. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

595. 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.**

596. 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**.

15.6.2 Scenario three

15.6.2.1 Construction phase

597. As per **Section 15.6.1**, 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 13.6**.

Frequency of occurrence

598. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

599. In English waters, the frequency of occurrence is considered to be extremely unlikely.

Severity of consequence

600. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

601. 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**.

602. 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**.

15.6.2.2 O&M phase

Frequency of occurrence

603. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

604. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

605. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

606. 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**.

607. 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**.

15.6.2.3 Decommissioning phase

608. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.6.2.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

609. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

610. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

611. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

612. 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**.

613. 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**.

15.6.3 Scenario four

15.6.3.1 Construction phase

614. 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 which has an impact on navigation. It is noted that crossings of these cables were considered as part of the MDS considered within **Section 13.6**.

615. 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 of equivalent height may have been required in these locations for the MHPGC Project without considering cumulative developments.

Frequency of occurrence

616. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

617. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

618. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

619. 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**.

620. 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**.

15.6.3.2 O&M phase

621. Up to four additional crossings of subsea cables, namely 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 13.6**.

Frequency of occurrence

622. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

623. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

624. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

625. 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**.

626. 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**.

15.6.3.3 Decommissioning phase

627. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.6.3.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach

to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

628. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

629. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

630. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

631. 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**.

632. 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**.

15.7 Anchor interaction with subsea cables

633. 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.

634. 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.

15.7.1 Scenario one and two

15.7.1.1 Construction phase

635. As per the impacts on vessel collision, Morven North and Morven South have the potential to lead to vessel routeing 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 expected that vessel traffic may be displaced out of the MHPGC Project PEIR Red Line Boundary by the wind farm, 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 13.7**.

Frequency of occurrence

636. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

637. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

638. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

639. 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**.

640. 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**.

15.7.1.2 O&M phase

641. 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 13.7** for the MHPGC Project alone.

Frequency of occurrence

642. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

643. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

644. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

645. 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**.

646. 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 **tolerable with mitigation**.

15.7.1.3 Decommissioning phase

647. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.7.1.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

648. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

649. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

650. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

651. 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**.

652. 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 **tolerable with mitigation**.

15.7.2 Scenario three

653. The presence of Morven North and Morven South, plus the MBAGC Project are not expected to lead to increased risk of anchor interaction with subsea cables beyond the assessment presented in **Section 13.7**.

15.7.2.1 Construction phase

Frequency of occurrence

654. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

655. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

656. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

657. 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**.

658. 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**.

15.7.2.2 O&M phase

Frequency of occurrence

659. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

660. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

661. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

662. 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**.

663. 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 **tolerable with mitigation**.

15.7.2.3 Decommissioning phase

664. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.7.2.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

665. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

666. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

667. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

668. 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**.

669. 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 **tolerable with mitigation**.

15.7.3 Scenario four

15.7.3.1 Construction phase

670. 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.

671. 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.

Frequency of occurrence

672. In Scottish waters, it is anticipated the frequency of occurrence is **extremely unlikely**.

673. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

674. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

675. 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**.

676. 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**.

15.7.3.2 O&M phase

677. 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.

Frequency of occurrence

678. In both Scottish and English waters, it is anticipated the frequency of occurrence is **extremely unlikely**.

Severity of consequence

679. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

680. 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**.

15.7.3.3 Decommissioning phase

681. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.7.3.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

682. In both Scottish and English waters, it is anticipated the frequency of occurrence is **extremely unlikely**.

Severity of consequence

683. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

684. 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**.

15.8 Fishing gear interaction with subsea cables

685. 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.

686. 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.

15.8.1 Scenario one and two

15.8.1.1 Construction phase

687. As noted in the same impact in **Section 13.8**, the majority of fishing activity was within English waters, particularly in the southern section of the Shipping and Navigation Study Area. Given the location of Morven North and Morven South in Scottish waters, 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 13.8**.

Frequency of occurrence

688. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

689. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

690. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

691. 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**.

692. 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**.

15.8.1.2 O&M phase

693. 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 13.8**.

Frequency of occurrence

694. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

695. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

696. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

697. 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**.

698. 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**.

15.8.1.3 Decommissioning phase

699. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.8.1.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

700. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

701. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

702. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

703. 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**.

704. 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**.

15.8.2 Scenario three

705. 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 13.8**.

15.8.2.1 Construction phase

Frequency of occurrence

706. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

707. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

708. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

709. 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**.

710. 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**.

15.8.2.2 O&M phase

Frequency of occurrence

711. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

712. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

713. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

714. 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**.

715. 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**.

15.8.2.3 Decommissioning phase

716. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.8.2.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

717. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

718. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

719. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

720. 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**.

721. 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**.

15.8.3 Scenario four

15.8.3.1 Construction phase

722. 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 such as the appointment of an FLO (as per CoT19), 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.

723. 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.

Frequency of occurrence

724. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

725. In English waters, the frequency of occurrence is considered to be **remote**.

Severity of consequence

726. The severity of consequence is considered to be **moderate** for both Scottish and English waters**.**

Significance of effect

727. 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**.

728. 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**.

15.8.3.2 O&M phase

729. 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 13.8**.

Frequency of occurrence

730. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

731. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

732. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

733. 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**.

734. 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 **tolerable with mitigation**.

15.8.3.3 Decommissioning phase

735. The approach to decommissioning will be determined based on legislation and best practice at the time and is therefore yet to be finalised. If the offshore export cables remain in-situ during the decommissioning phase, the hazard is expected to be similar in nature to the O&M phase [see **Section 15.8.3.2**], including in relation to spatial and temporal extent, likelihood and potential consequences. The approach to decommissioning will be agreed with stakeholders as part of the preparation of the Offshore Decommissioning Plan.

Frequency of occurrence

736. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

737. In English waters, the frequency of occurrence is considered to be **extremely unlikely**.

Severity of consequence

738. The severity of consequence is considered to be **moderate** for both Scottish and English waters.

Significance of effect

739. 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**.

740. 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 **tolerable with mitigation**.

15.9 Interference with navigation, communications and position-fixing equipment

741. 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.

742. 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.

15.9.1 Scenario one and two

15.9.1.1 Construction phase

743. 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 13.9**.

Frequency of occurrence

744. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

745. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

746. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

747. 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**.

748. 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 and ALARP**.

15.9.1.2 O&M phase

749. As per the construction phase, 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 13.9**.

Frequency of occurrence

750. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

751. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

752. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

753. 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**.

754. 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 and ALARP**.

15.9.2 Scenario three

755. As per **Section 15.9.1**, 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 13.9**.

15.9.2.1 Construction phase

Frequency of occurrence

756. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

757. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

758. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

759. 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**.

760. 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 and ALARP**.

15.9.2.2 O&M phase

761. 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 13.9**.

Frequency of occurrence

762. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

763. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

764. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

765. 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**.

766. 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 and ALARP**.

15.9.3 Scenario four

15.9.3.1 Construction phase

767. 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 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 with cables in close proximity, where 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.

Frequency of occurrence

768. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

769. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

770. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

771. 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**.

772. 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 and ALARP**.

15.9.3.2 O&M phase

773. As per the construction phase, 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 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 with cables in close proximity 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.

Frequency of occurrence

774. In Scottish waters, it is anticipated the frequency of occurrence is **negligible**.

775. In English waters, the frequency of occurrence is considered to be **reasonably probable**.

Severity of consequence

776. The severity of consequence is considered to be **minor** for both Scottish and English waters.

Significance of effect

777. 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**.

778. 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 and ALARP**.

16 Summary

779. This NRA has presented an assessment of hazards associated with the MHPGC Project PEIR Red Line Boundary relating to shipping and navigation, based on baseline analysis, expert opinion and feedback received through consultation. Hazards have been identified and assessed for the construction, O&M and decommissioning phases, in line with the IMO's FSA process.

16.1 Baseline environment

16.1.1 Navigational features

780. **Section 7** presents an overview of the navigational features in proximity to the MHPGC Project PEIR Red Line Boundary, including identifying the nearby ports and harbours, anchorages, subsea infrastructure, offshore wind farms and areas of third-party marine activity. Nearby ports and harbours include the Port of Seaham, the Port of Sunderland and Teesport, with their associated anchorages and pilotage considered within that section.

16.1.2 Emergency response resources

781. **Section 8** presents a review of the emergency response resources and historical incident data in proximity to the MHPGC Project PEIR Red Line Boundary. This includes the locations of RNLI lifeboat stations, SAR heli-bases and MRCCs, as well as the numbers, types and locations of historical incidents reported by the RNLI, MAIB and DfT.

16.1.3 Vessel traffic movements

782. **Section 9** presents analysis of vessel traffic data, primarily based on 12 months of AIS data, supplemented by VMS data for fishing vessels. This included analysis of vessels by size, vessel numbers and vessel type. Reviews of active fishing and anchoring are also presented, along with discussion of future vessel traffic.

16.2 Risk assessment

783. A risk assessment in line with the IMO's FSA approach is presented in **Section 4**. The risk assessment presents a significance ranking for each hazard relating to shipping and navigation, based on rankings for frequency of occurrence and severity of consequence. Rankings have been based on the baseline analysis, expert opinion, and stakeholder consultation.

784. The significance of all hazards has been assessed to be either broadly acceptable or tolerable with mitigation, with all hazards assessed to be ALARP, assuming embedded mitigation measures are implemented.

785. A cumulative risk assessment was also carried out, finding that the significance of all hazards remained broadly acceptable or tolerable with mitigation.

786. A hazard log documenting the hazards, mitigation measures, and significance of risk is provided in **Appendix A**.

787. **Appendix B** presents a completed MGN 654 Checklist.

16.3 Next steps

788. Following the publication of the PEIR, the NRA will be reviewed and updated based on feedback received. All received feedback will be incorporated into a finalised NRA and ES chapter as part of the consent application. The RYA Coastal Atlas will also be reviewed at the ES stage to provide further detail on recreational vessel activities to supplement the AIS data reviewed at the PEIR stage.

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Appendix A Hazard Log

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
Increased vessel to vessel collision risk resulting from MHPGC Project vessel movements (third-party to MHPGC Project vessel)	Construction	▪ Promulgation of information ▪ Adherence to NSP and VTMP ▪ Appropriate lighting and marking of MHPGC Project vessels ▪ Adherence to MPCP ▪ Compliance with Flag State Regulations	Scottish	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Remote	Moderate	Tolerable with Mitigation	Not required	Tolerable with Mitigation
	O&M		Both	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
	Decommissioning		Scottish	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Remote	Moderate	Tolerable with Mitigation	Not required	Tolerable with Mitigation
Increased vessel to vessel collision risk resulting from displacement (third-party to third-party)	Construction	▪ Promulgation of information ▪ Adherence to NSP and VTMP ▪ Appropriate lighting and marking of MHPGC Project vessels	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
	O&M		Both	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
	Decommissioning		Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
		▪ Adherence to MPCP ▪ Compliance with Flag State Regulations	English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
Reduced access to local ports and harbours	Construction	▪ Marine coordination ▪ Promulgation of information ▪ Adherence to Flag State Regulations ▪ Adherence to MPCP ▪ Adherence to NSP and VTMP	Scottish	Negligible	Minor	Broadly Acceptable	Not required	Broadly Acceptable
			English	Reasonably Probable	Minor	Tolerable with Mitigation	Not required	Tolerable with Mitigation
	Decommissioning		Scottish	Negligible	Minor	Broadly Acceptable	Not required	Broadly Acceptable
			English	Reasonably Probable	Minor	Tolerable with Mitigation	Not required	Tolerable with Mitigation
Disruption to third-party marine activities	Construction	▪ Marine coordination ▪ Promulgation of information ▪ Adherence to Flag State Regulations ▪ Adherence to MPCP	Scottish	Negligible	Minor	Broadly Acceptable	Not required	Broadly Acceptable
			English	Remote	Minor	Broadly Acceptable	Not required	Broadly Acceptable
	O&M		Scottish	Negligible	Minor	Broadly Acceptable	Not required	Broadly Acceptable
			English	Extremely Unlikely	Minor	Broadly Acceptable	Not required	Broadly Acceptable

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
	Decommissioning	▪ Adherence to NSP and VTMP ▪ Appropriate lighting and marking of MHPGC Project vessels	Scottish	Negligible	Minor	Broadly Acceptable	Not required	Broadly Acceptable
			English	Remote	Minor	Broadly Acceptable	Not required	Broadly Acceptable
Reduction of under keel clearance	Construction	▪ Promulgation of information ▪ Guard vessels (as required) ▪ Adherence to MPCP ▪ Adherence to MGN 654 ▪ Adherence to CSIP	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
	O&M	▪ Marking on Admiralty Charts ▪ Adherence to MPCP	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
		▪ Adherence to MGN 654 ▪ Adherence to CSIP	English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
	Decommissioning	▪ Marking on Admiralty Charts ▪ Adherence to MPCP ▪ Adherence to MGN 654 ▪ Adherence to CSIP	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
Anchor interaction with subsea cables	Construction	▪ Promulgation of information ▪ Guard vessels (as required) ▪ Adherence to MPCP	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
		▪ Adherence to MGN 654 ▪ Adherence to CSIP	English	Remote	Moderate	Tolerable with Mitigation	Not required	Tolerable with Mitigation
	O&M	▪ Promulgation of information ▪ Guard vessels (as required) ▪ Adherence to MPCP ▪ Adherence to MGN 654 ▪ Adherence to CSIP	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
	Decommissioning	▪ Promulgation of information ▪ Guard vessels (as required) ▪ Adherence to MPCP	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
		▪ Adherence to MGN 654 ▪ Adherence to CSIP	English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
Fishing gear interaction with subsea cables	Construction	▪ Promulgation of information ▪ Guard vessels (as required) ▪ Adherence to MPCP ▪ Adherence to MGN 654 ▪ Adherence to CSIP	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Remote	Moderate	Tolerable with Mitigation	Not required	Tolerable with Mitigation
	O&M	▪ Promulgation of information ▪ Guard vessels (as required) ▪ Adherence to MPCP ▪ Adherence to MGN 654	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
		▪ Adherence to CSIP						
	Decommissioning	▪ Promulgation of information ▪ Guard vessels (as required) ▪ Adherence to MPCP ▪ Adherence to MGN 654 ▪ Adherence to CSIP	Scottish	Negligible	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
			English	Extremely Unlikely	Moderate	Broadly Acceptable	Not required	Broadly Acceptable
Interference with navigation, communications and position fixing equipment	Construction	▪ Adherence to CSIP ▪ Marking on Admiralty charts ▪ Compass deviation study	Scottish	Negligible	Minor	Broadly Acceptable	Not required	Broadly Acceptable

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
			English	Reasonably Probable	Minor	Tolerable with Mitigation	Not required	Tolerable with Mitigation
	O&M	▪ Adherence to CSIP ▪ Marking on Admiralty charts ▪ Compass deviation study	Scottish	Negligible	Minor	Broadly Acceptable	Not required	Broadly Acceptable

Hazard	MHPGC Project phase	Mitigation measures	Scottish/ English waters	Frequency of occurrence	Severity of consequence	Significance of risk	Secondary mitigation measures	Residual risk
			English	Reasonably Probable	Minor	Tolerable with Mitigation	Not required	Tolerable with Mitigation

Appendix B Marine Guidance Note 654 Checklist

789. The MGN 654 Checklist can be divided into two distinct checklists, one considering the main MGN 654 guidance document and one considering the Methodology for Assessing Marine Navigational Safety and Emergency Response Risks of OREIs which serves as Annex 1 to MGN 654.

790. Due to the nature of the MHPGC Project which consists of subsea infrastructure only and no surface infrastructure, certain aspects of the checklists are not relevant.

791. The checklist for the main MGN 654 guidance document is presented in **Table B.1**. Following this, the checklist for the MCA's methodology annex is presented in **Table B.2**. For both checklists, references to where the relevant information and/or assessment is provided in the NRA is given.

Table B.1 MGN 654 checklist for main document

Issue	Compliance	Comments
Site and Construction Coordinates. Developers are responsible for ensuring that formally agreed coordinates and subsequent variations of site perimeters and individual OREI structures are made available, on request, to interested parties at relevant project stages, including application for consent, development, array variation, operation and decommissioning. This should be supplied as authoritative Geographical Information System (GIS) data, preferably in Environmental Systems Research Institute (ESRI) format. Metadata should facilitate the identification of the data creator, its date and purpose, and the geodetic datum used. For mariners' use, appropriate data should also be provided with latitude and longitude coordinates in WGS84 (European Terrestrial Reference System 1989 (ETRS89)) datum.		
Traffic Survey. Includes:		
All vessel types.	✓	**Section 9** presents analysis of 12 months of AIS data, including analysis by vessel type.
At least 28 days duration, within either 12 or 24 months prior to submission of the ES.	✓	**Section 9** presents analysis of 12 months AIS data, recorded between October 2024 and September 2025.
Multiple data sources.	✓	**Section 6** presents the data sources considered within the baseline characterisation. This includes AIS data, and additional data sources such VMS data, Admiralty charts and Sailing Directions.
Seasonal variations.	✓	The AIS analysis presented in Section 9 covers 12 months AIS data, capturing seasonal variations in shipping activity.
MCA consultation.	✓	The MCA have been consulted both via the Scoping Opinion and directly at the PEIR stage, as detailed in **Section 5**.
GLA consultation.	✓	Both Trinity House and NLB were consulted directly at the PEIR stage, as detailed in **Section 5**.
UK Chamber of Shipping consultation.	✓	**Section 5** presents the consultation undertaken throughout the NRA process, including consultation with the UK Chamber of Shipping.

Issue	Compliance	Comments
Recreational and fishing vessel organisations consultation.	✓	**Section 5** presents the consultation undertaken throughout the NRA process, including consultation with the RYA Scotland. The RYA and the Cruising Association were also invited to consult.
Port and navigation authorities consultation, as appropriate.	✓	**Section 5** presents the consultation undertaken throughout the NRA process, including consultation with local ports including the Port of Seaham, the Port of Sunderland and Teesport.
Assessment of the cumulative and individual effects of (as appropriate):		
i. Proposed OREI site relative to areas used by any type of marine craft.	✓	**Section 9** presents analysis of vessel traffic in proximity to the MHPGC Project PEIR Red Line Boundary. Assessment of the hazards relating to the MHPGC Project are presented in **Section 13**. An assessment of cumulative effects is presented in **Section 15**.
ii. Numbers, types and sizes of vessels presently using such areas.	✓	**Section 9** presents analysis of vessel traffic in proximity to the MHPGC Project PEIR Red Line Boundary, including analysis based on numbers, types and sizes of vessels. An assessment of cumulative effects is presented in **Section 15**.
iii. Non-transit uses of the areas, e.g., fishing, day cruising of leisure craft, racing, aggregate dredging, personal watercraft, etc.	✓	**Section 9** presents analysis of vessel traffic in proximity to the MHPGC Project PEIR Red Line Boundary, including analysis of non-transit uses. Assessment of disruption to these activities is presented in **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR** and **Volume 2, Chapter 10: Infrastructure and Other Sea Users.**
iv. Whether these areas contain transit routes used by coastal or deep-draught vessels on passage.	✓	**Section 9** presents analysis of vessel traffic in proximity to the MHPGC Project PEIR Red Line Boundary, including analysis of main vessel routeing. Assessment hazards relating to these routes is presented in **Section 13**. An assessment of cumulative effects is presented in **Section 15**.
v. Alignment and proximity of the site relative to adjacent shipping lanes.	✓	**Section 9** presents analysis of vessel traffic in proximity to the MHPGC Project PEIR Red Line Boundary, including identification of shipping lanes, noting that there were no IMO Routeing Measures within the Shipping and Navigation Study Area. Assessment of hazards relating to vessel routeing is presented in **Section 13**. An assessment of cumulative effects is presented in **Section 15**.
vi. Whether the nearby area contains prescribed routeing schemes or precautionary areas.	✓	**Section 9** presents analysis of vessel traffic in proximity to the MHPGC Project PEIR Red Line Boundary, including identification of shipping lanes, noting that there were no IMO Routeing Measures within the Shipping and Navigation Study Area. Assessment of hazards relating to vessel routeing is presented in **Section 13**. An assessment of cumulative effects is presented in **Section 15**.
vii. Proximity of the site to areas used for anchorage (charted or uncharted), safe haven, port approaches and pilot boarding or landing areas.	✓	Anchorage areas, ports and pilotage facilities are identified in **Section 7**, with analysis of anchored vessel activity following in **Section 9**. A risk assessment is presented in **Section 13**, including hazards relating to port access, and anchored vessels. An assessment of cumulative effects is presented in **Section 15**.

Issue	Compliance	Comments
viii. Whether the site lies within the jurisdiction of a port and/or navigation authority.	✓	The MHPGC Project PEIR Red Line Boundary does not overlap with any port limits, however nearby ports are identified in **Section 7**, with hazards associated with port access assessed in **Section 13**. An assessment of cumulative effects is presented in **Section 15**.
ix. Proximity of the site to existing fishing grounds, or to routes used by fishing vessels to such grounds.	✓	Fishing vessel activity is presented in **Section 9**, with fishing gear snagging considered within the risk assessment presented in **Section 13**. An assessment of cumulative effects is presented in **Section 15**. Disruption to fishing activity is assessed in **Volume 2, Chapter 7: Commercial Fisheries, of the PEIR.**
x. Proximity of the site to offshore firing/bombing ranges and areas used for any marine military purposes.	✓	The MHPGC Project PEIR Red Line Boundary does overlaps one firing practice area as identified in **Section 7**, with hazards associated with disruption to third-party activity assessed in **Section 13**. An assessment of cumulative effects is presented in **Section 15**.
xi. Proximity of the site to existing or proposed submarine cables or pipelines, offshore oil/gas platforms, marine aggregate dredging, marine archaeological sites or wrecks, Marine Protected Areas or other exploration/exploitation sites.	✓	**Section 7** presents existing navigational features in proximity to the MHPGC Project PEIR Red Line Boundary, with future developments considered within **Section 10**. **Sections 13** presents a risk assessment for the MHPGC Project, including disruption to third-party marine activities. An assessment of cumulative effects is presented in **Section 15.**
xii. Proximity of the site to existing or proposed OREI developments, in cooperation with other relevant developers, within each round of lease awards.	✓	Proximity to nearby OREI developments is considered within **Section 7**, with proposed developments highlighted in **Section 10**.
xiii. Proximity of the site relative to any designated areas for the disposal of dredging spoil or other dumping ground.	✓	Spoil grounds are considered within the review of navigational features presented in **Section 7** with disruption to third-party marine activities considered within the risk assessment in **Section 13**.
xiv. Proximity of the site to aids to navigation and/or Vessel Traffic Service (VTS) in or adjacent to the area	✓	Aids to Navigation are considered within the review of navigational features presented in **Section 7**, noting the presence of one buoy within the MHPGC Project PEIR Red Line Boundary close to the landfall, with another two in Scottish waters which are part of the Morven Programme and are expected to be removed ahead of the construction phase.

Issue	Compliance	Comments
and any impact thereon.		
xv. Researched opinion using computer simulation techniques with respect to the displacement of traffic and, in particular, the creation of 'choke points' in areas of high traffic density and nearby or consented OREI sites not yet constructed.	✓	No permanent displacement of traffic and no choke points are anticipated due to the lack of surface piercing infrastructure.
xvi. With reference to xv. above, the number and type of incidents to vessels which have taken place in or near to the proposed site of the OREI to assess the likelihood of such events in the future and the potential impact of such a situation.	✓	Historical incident data and the locations of emergency response resources are reviewed in **Section 8**.
xvii. Proximity of the site to areas used for recreation which depend on specific features of the area.	✓	Recreational activity is reviewed in **Section 9**, with consultation with recreational stakeholders detailed in **Section 5**. Assessment of disruption to recreational activities is presented in **Volume 2, Chapter 10: Infrastructure and Other Sea Users.**
Predicted effect of OREI on traffic and interactive boundaries. Where appropriate, the following should be determined:		
a. The safe distance between a shipping route and OREI boundaries.	-	Not applicable for subsea cables.
b. The width of a corridor between sites or OREIs to allow safe passage of shipping.	-	Not applicable for subsea cables.
OREI Structures. The following should be determined:		
a. Whether any feature of the OREI, including auxiliary platforms outside the main generator site, mooring and anchoring systems,	✓	An assessment of risk relating to the MHPGC Project is presented in **Section 13**.

Issue	Compliance	Comments
inter-device and export cabling could pose any type of difficulty or danger to vessels underway, performing normal operations, including fishing, anchoring and emergency response.		
b. Clearances of fixed or floating WTG blades above the sea surface are not less than 22m (above MHWS for fixed). Floating turbines allow for degrees of motion.	-	Not applicable for subsea cables.
c. Underwater devices: i. Changes to charted depth; ii. Maximum height above seabed; iii. Under keel clearance.	✓	Reduction in under keel clearance is assessed as part of the risk assessment presented in **Section 13**.
d. Whether structures block or hinder the view of other vessels or other navigational features.	-	Not applicable for subsea cables.
The effect of tides, tidal streams and weather. It should be determined whether:		
a. Current maritime traffic flows and operations in the general area are affected by the depth of water in which the proposed construction is situated at various states of the tide, i.e. whether the construction could pose problems at high water which do not exist at low water conditions, and vice versa.	✓	**Section 9** presents vessel traffic analysis which includes analysis of vessel draughts and routeing. Reduction in under keel clearance is assessed within **Section 13**.
b. The set and rate of the tidal stream, at any state of the tide, has a	-	Not applicable for subsea cables.

Issue	Compliance	Comments
significant effect on vessels in the area of the OREI site.		
c. The maximum rate tidal stream runs parallel to the major axis of the proposed site layout, and, if so, its effect.	-	
d. The set is across the major axis of the layout at any time, and, if so, at what rate.	-	
e. In general, whether engine failure or other circumstance could cause vessels to be set into danger by the tidal stream, including unpowered vessels and small, low speed craft.	-	
f. The structures themselves could cause changes in the set and rate of the tidal stream.	-	
g. The structures in the tidal stream could be such as to produce siltation, deposition of sediment or scouring, affecting navigable water depths in the wind farm area or adjacent to the area.	-	
h. The site, in normal, bad weather, or restricted visibility conditions, could present difficulties or dangers to craft, including sailing vessels, which might pass in close proximity to it.	-	
i. The structures could create problems in the area for vessels under sail, such as wind	-	

Issue	Compliance	Comments
masking, turbulence or sheer.		
j. In general, taking into account the prevailing winds for the area, whether engine failure or other circumstances could cause vessels to drift into danger, particularly if in conjunction with a tidal set such as referred to above.	-	
Assessment of access to and navigation within, or close to, an OREI. To determine the extent to which navigation would be feasible within the OREI site itself by assessing whether:		
a. Navigation within or close to the site would be safe:		
i. For all vessels.	-	No restriction to access associated with subsea cables. Temporary restrictions to port and harbour access are considered within **Section 13**.
ii. For specified vessel types, operations and/or sizes.		
iii. In all directions or areas.		
iv. In specified directions or areas.		
v. In specified tidal, weather or other conditions.		
b. Navigation in and/or near the site should be prohibited or restricted:		
i. For specified vessel types, operations and/or sizes.	-	No restriction to access associated with subsea cables.
ii. In respect of specific activities.	-	
iii. In all areas or directions.	-	

Issue	Compliance	Comments
iv. In specified areas or directions.	-	
v. In specified tidal or weather conditions.	-	
c. Where it is not feasible for vessels to access or navigate through the site it could cause navigational, safety or routeing problems for vessels operating in the area, e.g., by preventing vessels from responding to calls for assistance from persons in distress.	-	
d. Guidance on the calculation of safe distance of OREI boundaries from shipping routes has been considered.	-	Not applicable for subsea cables.
SAR, maritime assistance service, counter pollution and salvage incident response.		
The MCA, through HMCG, is required to provide SAR and emergency response within the sea area occupied by all OREIs in UK waters. To ensure that such operations can be safely and effectively conducted, certain requirements must be met by developers and operators.		
a. An ERCoP will be developed for the construction, operation and decommissioning phases of the OREI.	-	The MCA confirmed in the Scoping Opinion that an ERCoP will not be required, noting that an MEAC will be sufficient (see **Section 5**).
b. The MCA's guidance document *Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for Search and Rescue and Emergency Response* (MCA, 2021) for the design, equipment and operation requirements will be followed.	✓	MGN 654 has been used as the primary guidance for the NRA, as noted in **Section 3**.
c. A SAR checklist will be completed to record	-	The MCA noted that the SAR checklist is not required, as noted in **Section 5**.

Issue	Compliance	Comments
discussions regarding the requirements, recommendations and considerations outlined in Annex 5 (to be agreed with MCA).		
Hydrography. In order to establish a baseline, confirm the safe navigable depth, monitor seabed mobility and to identify underwater hazards, detailed and accurate hydrographic surveys are included or acknowledged for the following stages and to MCA specifications:		
i. Pre-construction: The proposed generating assets area and proposed cable route.	✓	It is noted within **Section 12** that the MHPGC Project will comply with MGN 654 (as per TBC MM-088), which includes the requirement for a hydrographic survey.
ii. On a pre-established periodicity during the life of the development.	✓	
iii. Post construction: Cable route(s).	✓	
iv. Post decommissioning of all or part of the development: the installed generating assets area and cable route.	✓	
Communications, Radar and positioning systems. To provide researched opinion of a generic and, where appropriate, site specific nature concerning whether:		
a. The structures could produce radio interference such as shadowing, reflections or phase changes, and emissions with respect to any frequencies used for marine positioning, navigation and timing (PNT) or communications, including GMDSS and AIS, whether ship borne, ashore or fitted to any of the proposed structures, to:		
i. Vessels operating at a safe navigational distance.	-	Not applicable for subsea cables.
ii. Vessels by the nature of their work necessarily operating at less than the safe navigational distance to the OREI, e.g., support vessels, survey vessels, SAR assets.	-	
iii. Vessels by the nature of their work necessarily operating within the OREI.	-	

Issue	Compliance	Comments
b. The structures could produce Radar reflections, blind spots, shadow areas or other adverse effects:		
i. Vessel to vessel.	-	Not applicable for subsea cables.
ii. Vessel to shore.	-	
iii. VTS Radar to vessel.	-	
iv. Racon to/from vessel.	-	
c. The structures and generators might produce SONAR interference affecting fishing, industrial or military systems used in the area.	-	
d. The site might produce acoustic noise which could mask prescribed sound signals.	-	
e. Generators and the seabed cabling within the site and onshore might produce EMFs affecting compasses and other navigation systems.	✓	Interference with navigational equipment is considered within the risk assessment presented in **Section 13**.
Risk mitigation measures recommended for OREI during construction, operation and decommissioning.		
Mitigation and safety measures will be applied to the OREI development appropriate to the level and type of risk determined during the EIA. The specific measures to be employed will be selected in consultation with the MCA and will be listed in the developer's ES. These will be consistent with international standards contained in, for example, SOLAS Chapter V (IMO, 1974), and could include any or all of the following:		
i. Promulgation of information and warnings through NtMs and other appropriate MSI dissemination methods.	✓	**Section 12** presents embedded mitigation measures, including promulgation of information (as per CoT04).
ii. Continuous watch by multi-channel VHF, including DSC.	✓	**Section 12** presents embedded mitigation measures, including marine coordination (as per CoT30).
iii. Safety zones of appropriate configuration, extent	-	Not applicable for subsea cables.

Issue	Compliance	Comments
and application to specified vessels[1].		
iv. Designation of the site as an Area to be Avoided (ATBA).	-	Not applicable for subsea cables.
v. Provision of aids to navigation as determined by the GLA.	✓	Aids to navigation are not anticipated to required as part the MHPGC Project, however consultation will be undertaken with GLAs throughout the NRA process.
vi. Implementation of routeing measures within or near to the development.	✓	There are no planned IMO routeing measures as a result of the MHPGC Project.
vii. Monitoring by Radar, AIS, Closed Circuit Television (CCTV) or other agreed means.	-	Not applicable for subsea cables.
viii. Appropriate means for OREI operators to notify, and provide evidence of, the infringement of Safety Zones.	-	Not applicable for subsea cables.
ix. Creation of an ERCoP with the MCA's SAR Branch for the construction phase onwards.	✓	The MCA confirmed in the Scoping Opinion that an ERCoP will not be required, noting that an MEAC will be sufficient (see **Section 5**).
x. Use of guard vessels, where appropriate.	✓	**Section 12** presents embedded mitigation measures, including deployment guard vessels where deemed necessary (as per CoT28).
xi. Update NRAs every two years, e.g. at testing sites.	-	Not applicable for subsea cables.
xii. Device-specific or array-specific NRAs.	-	Not applicable for subsea cables.
xiii. Design of OREI structures to minimise risk to contacting vessels or craft.	-	Not applicable for subsea cables.
xiv. Any other measures and procedures considered appropriate in	✓	Mitigation measures were discussed as part of the consultation outlined in **Section 5,** and are presented in **Section 12**.

[1] As per SI 2007 No 1948 "The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007.

Issue	Compliance	Comments
consultation with other stakeholders.		

Table B.2 MGN 654 Checklist Annex 1

Item	Compliance	Comments
A risk claim is included that is supported by a reasoned argument and evidence.	✓	**Section 13** presents a risk assessment which includes a risk claim for a range of hazards, with assessment based on baseline data analysis, expert opinion and stakeholder consultation.
Description of the marine environment.	✓	**Section 7** presents a description of the marine environment based on navigational features, with baseline vessel traffic presented in **Section 9**.
SAR overview and assessment.	✓	**Section 8** presents an overview of historical incident data and emergency response resources in proximity to the MHPGC Project PEIR Red Line Boundary.
Description of the OREI development and how it changes the marine environment.	✓	**Section 2** presents an overview of the MHPGC Project relevant to shipping and navigation.
Analysis of the marine traffic, including base case and future traffic densities and types.	✓	**Section 9** presents analysis of 12 months of AIS vessel traffic data.
Status of the hazard log: ▪ Hazard identification; ▪ Risk assessment; ▪ Influences on level of risk; ▪ Tolerability of risk; and ▪ Risk matrix.	✓	A risk control log, summarising the findings of the risk assessment is presented in **Appendix A**.
NRA: ▪ Appropriate risk assessment; ▪ MCA acceptance for assessment techniques and tools; ▪ Demonstration of results; and ▪ Limitations.	✓	The document constitutes an NRA, carried out following the IMO's FSA Guidelines and MGN 654 as noted in **Section 3**.
Risk control log	✓	A hazard log, summarising the findings of the risk assessment is presented in **Appendix A,** and constitutes a risk control log.