Cambois Connection – Marine Scheme

Environmental Statement – Volume 2

Chapter 13: Shipping and Navigation

sse Renewables

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Acronyms

Acronym	Description
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
AtoN	Aid to Navigation
BBWF	Berwick Bank Wind Farm
CBRA	Cable Burial Risk Assessment
CD	Chart Datum
CLV	Cable Lay Vessel
COLREGs	Convention on International Regulations for Preventing Collisions at Sea
CoS	Chamber of Shipping
DESNZ	Department for Energy Security & Net Zero
DfT	Department for Transport
DP	Dynamic Positioning
DSC	Digital Selective Calling
DWT	Dead Weight Tonnage
EEA	European Economic Area
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
ERCoP	Emergency Response Cooperation Plan
ES	Environmental Statement
FLO	Fisheries Liaison Officer
FSA	Formal Safety Assessment
GLA	General Lighthouse Authority
HDD	Horizontal Directional Drilling
HMCG	His Majesty's Coastguard
HVDC	High Voltage Direct Current
IHO	International Hydrographic Organisation
IMO	International Maritime Organization
JRCC	Joint Rescue Coordination Centre
MAIB	Marine Accident Investigation Branch

Acronym	Description
MCA	Maritime and Coastguard Agency
MDS	Maximum Design Scenario
MEAC	Marine Emergency Action Card
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MRCC	Maritime Rescue Coordination Centres
MRSC	Maritime Rescue Sub Centre
MD-LOT	Marine Directorate Licensing Operations Team
NAVTEX	Navigational Telex
NIFCA	Northumberland Inshore Fisheries and Conservation Authority
NLB	Northern Lighthouse Board
NMP	National Marine Plan
NNG	Neart Na Gaoithe
NRA	Navigational Risk Assessment
NtM	Notice to Mariners
OCV	Offshore Construction Vessel
OREI	Offshore Renewable Energy Installation
PDE	Project Design Envelope
PLL	Potential Loss of Life
RAM	Restricted in their Ability to Manoeuvre
RNLI	Royal National Lifeboat Institution
RYA	Royal Yachting Association
SAR	Search and Rescue
SOLAS	International Convention for the Safety of Life at Sea
TCE	The Crown Estate
UKHO	United Kingdom Hydrographic Office
UNCLOS	United Nations Convention on the Law of the Sea
VHF	Very High Frequency
VMS	Vessel Monitoring System

Acronym	Description
WTG	Wind Turbine Generator

Units

Unit	Description
%	Percentage
km	Kilometre
m	Metre
t	Metric Tonne(s)
nm	Nautical Miles

13 Shipping and Navigation

13.1. Introduction

1. This chapter presents the assessment of the likely significant effects (as per the "Environmental Impact Assessment (EIA) Regulations"1) on the environment impacts arising from the Cambois Connection (hereafter referred to as "the Project") Marine Scheme on shipping and navigation. Specifically, this chapter of the Marine Scheme Environmental Statement (ES) considers the potential impact of the Marine Scheme seaward of Mean High Water Springs (MHWS) during the construction, operation and maintenance, and decommissioning phases.

2. This assessment is informed by the following ES chapters:

   - Volume 2, Chapter 3: EIA Methodology;
   - Volume 2, Chapter 4: Stakeholder Consultation and Engagement;
   - Volume 2, Chapter 5: Project Description;
   - Volume 2, Chapter 12: Commercial Fisheries; and
   - Volume 2, Chapter 15: Other Sea Users.

3. This chapter summarises information contained within the Navigational Risk Assessment (NRA) (see Volume 3, Appendix 13.1) which, as required by the Maritime and Coastguard Agency's (MCA), is informed by Marine Guidance Note (MGN) 654 (MCA, 2021a) including the undertaking of a Formal Safety Assessment (FSA). The FSA has been translated into the impact assessment methodology as outlined in section 13.10.

13.2. Purpose of this Chapter

4. This chapter:

   - Presents the existing baseline established from desk studies and feedback obtained during technical engagement with stakeholders;
   - Identifies any assumptions and limitations encountered in compiling the information;
   - Presents the potential impacts on shipping and navigation arising from the Marine Scheme to determine the significance of the impact as broadly acceptable, tolerable (with mitigation to ensure the risk is As Low As Reasonably Practicable (ALARP) or unacceptable based on the information gathered and the analysis and assessments undertaken, and reaches a conclusion on the likely significant effects on shipping and navigation;
   - Identifies where impacts are relevant to the Marine Scheme in Scottish waters, English waters or both. Where there is no separation of assessment of impacts, the assessment for the Marine Scheme (as a whole entity) applies to the Marine Scheme in Scottish waters and English waters separately; and
   - Highlights any necessary monitoring and/or mitigation measures recommended to prevent, minimise, reduce or offset the likely significant adverse environmental effects of the Marine Scheme on shipping and navigation.

[1] For the Marine Scheme, this is the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended).

13.3. Shipping and Navigation Study Area

5. The Shipping and Navigation Study Area is defined as a 5 nautical mile (nm) buffer of the Marine Scheme, as presented in Volume 4, Figure 13.1.

6. The Shipping and Navigation Study Area extends up to Mean High Water Springs (MHWS) at the shoreline (i.e. marine area only).

7. The 5 nm buffer is considered sufficient to characterise the shipping activity and navigational features close to the Marine Scheme and to encompass any vessel traffic that may be impacted by the construction of the Offshore Export Cables and associated operation and maintenance and decommissioning, as agreed through consultation with stakeholders.

8. The Shipping and Navigation Study Area was presented to key stakeholders, including the MCA, Trinity House and Northern Lighthouse Board (NLB), as part of discussions on NRA approach, which was considered appropriate (see Table 13.3).

13.4. Policy and Legislative Context

9. A summary of the policy and legislative provisions relevant to shipping and navigation are provided in Table 13.1 and Table 13.2 below.

Table 13.1 Summary of marine policy relevant to Shipping and Navigation

Relevant Policy	Summary of Relevant Policy Framework	How and Where Considered in the ES
Scotland and England (UK)		
United Kingdom (UK) Marine Policy Statement (Department for Environment, Food and Rural Affairs (DEFRA), 2011)	The UK Marine Policy Statement provides a framework for preparing Marine Plans and taking decisions affecting the marine environment. Paragraph 3.4.7 states *"Increased competition for marine resources may affect the sea space available for the safe navigation of ships. Marine plan authorities and decision makers should take into account and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety and ensure that their decisions are in compliance with international maritime law".*	Displacement of existing routes and activity and subsequent increases in collision risk has been considered as part of the impact assessment (see section 13.12).
Scotland		
Scotland's National Marine Plan (NMP) (Scottish Government, 2015)	*Transport 1 "Navigational safety in relevant areas used by shipping now and in the future will be protected, adhering to the rights of innocent passage and freedom of navigation contained in United Nations Convention on the Law of the Sea (UNCLOS). The following factors will be taken into account when reaching decisions regarding development and use:* *The extent to which the locational decision interferes with existing or planned routes used by shipping, access to ports and harbour sand navigational safety. This includes commercial anchorages and defined approaches to ports.* *Where interference is likely, whether reasonable alternatives can be identified. Where there are no reasonable alternatives, whether mitigation through measures adopted in accordance with the principles and procedures established by the IMO can be achieved at no significant cost to the shipping or ports sector."*	All marine planning policies for shipping, ports, harbours and ferries have been considered fully throughout this ES chapter. Particular regard is given to the displacement of vessel traffic and reduced access to local ports. Mitigation measures have been identified to reduce the effect of such impacts (see section 13.11).

Relevant Policy	Summary of Relevant Policy Framework	How and Where Considered in the ES
	Transport 2 "Marine development and use should not be permitted where it will restrict access to, or future expansion of, major commercial ports or existing or proposed port sand harbours." *Transport 3 "Ferry routes and maritime transport to island and remote mainland areas provide essential connections and should be safeguarded from inappropriate marine development.* *Developments will not be consented where they will unacceptably interfere with lifeline ferry services."* *Transport 6 "Developers should ensure displacement of shipping is avoided where possible to mitigate against potential increased journey lengths (and associated fuel costs, emissions and impact on journey frequency)."*	
England		
Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) (Department for Energy Security & Net Zero (DESNZ), 2023)[2,3]	Paragraph 3.8.194 states *"To ensure safety of shipping applicants should reduce risks to navigational safety to as low as reasonably practicable (ALARP)"*	The International Maritime Organization (IMO) FSA methodology (IMO, 2018) has been applied for assessing effects on shipping and navigation receptors including application of the ALARP principle to ensure risks are within tolerable levels. The methodology for assessment is provided in 13.10.

[2] Whilst it is acknowledged that neither BBWF nor the Marine Scheme comprise or form part of an NSIP (please see Volume 2: Chapter 2: Policy and Legislative Context), NPSs are however a statement of government intention relating, in this case, to renewable energy projects, therefore can be taken into consideration during the preparation of the Marine Scheme ES

[3] A suite of draft revised Energy NPSs were published and consulted on by the UK Government in March 2023, and consultation closed on 23rd June. The consultation responses will be subject to consideration and the draft revised NPSs may now be revised before the NPSs are formally adopted. There is currently no date for the next stage of the review process and therefore this ES presents the current adopted NPSs which have been considered during the preparation of this ES. It is however noted by the Applicant that the new draft NPSs state that they may be material considerations in other applications which are not considered under the Planning Act (2008), this includes the Marine Scheme. Further detail on the consideration of the draft NPSs in this ES is provided in Volume 2 Chapter 2 Policy and Legislation.

Relevant Policy	Summary of Relevant Policy Framework	How and Where Considered in the ES
	Paragraph 3.8.199 and 3.8.200 state *"Applicants should engage with interested parties in the navigation sector early in the pre-application phase of the proposed offshore wind farm to help identify mitigation measures, including alterations to navigation routes, to facilitate proposed offshore wind development. This includes the MMO or NRW in Wales, MCA, the relevant General Lighthouse Authority, such as Trinity House, the relevant industry bodies (both national and local) and any representatives of recreational users of the sea, such as the Royal Yachting Association (RYA), who may be affected. This should continue throughout the life of the development including during the construction, operation and decommissioning phases. Engagement should seek solutions that allow offshore wind farms to successfully co-exist with navigation and shipping uses of the sea."*	Stakeholder engagement is considered a key input to the shipping and navigation baseline and impact assessment. Consultation which has been undertaken is outlined in Table 13.3.
	Paragraph 3.8.201 states *"The presence of the wind turbines can also have impacts on communication and shipborne and shore-based radar systems."*	Interference with magnetic position fixing equipment is assessed in section 13.12.
	Paragraphs 3.8.202 and 3.8.203 state *"Prior to undertaking assessments applicants should consider information on internationally recognised sea lanes, which is publicly available.* *Applicants should refer in assessments to any relevant, publicly available data available on the Maritime Database."*	Internationally recognised sea lanes, other identified routes and navigational features are considered a key element of the shipping and navigation baseline. The methodology for baseline data gathering and baseline conditions is outlined in section 13.10.
	Paragraph 3.8.204 states *"Applicants should undertake a Navigational Risk Assessment (NRA) in accordance with relevant government guidance prepared in consultation with the MCA and the other navigation stakeholders listed above."*	The NRA is considered a key input to the shipping and navigation impact assessment including compliance with MCA guidance documents. The NRA is provided in Volume 3, Appendix 13.1 and its methodology was agreed during consultation with the MCA, Trinity House and Northern Lighthouse Board (Table 13.3).
	Paragraph 3.8.210 and 3.8.211 state *"Should consent for the offshore wind farm be granted, applicants should undertake a detailed Search and Rescue Response Assessment prior to commencement of construction. This assessment could be secured by a requirement to any consent.*	Consideration of emergency response resources is provided in the NRA.

Relevant Policy	Summary of Relevant Policy Framework	How and Where Considered in the ES
	However, where there are significant concerns over the frequency or the consequences of such incidents, applicants may be required to take a full assessment before the application can be determined."	
North East Inshore and North East Offshore Marine Plan (MMO, 2021)	*NE-PS-1: Ports and harbours are essential to realising economic and social benefits for the north east marine plan areas and the UK. NE-PS-1 makes sure that proposals do not restrict current port and harbour activity or future growth, enabling long-term strategic decisions, and supporting competitive and efficient port and shipping operations.* *NE-PS-2: International Maritime Organization routeing systems are essential for shipping activity, freedom of navigation and navigational safety. Within the north east marine plan areas there are currently no such routeing systems. However, International Maritime Organization routeing systems may or may not be introduced over the lifetime of the Plan. NEPS-2 confirms that proposals that compromise these important navigation routes should not be authorised.* *NE-PS-3: The north east marine plan areas are very busy with respect to high-density navigation routes, strategically important navigation routes and passenger services. NE-PS-3 confirms that proposals that pose a risk to safe navigation or the viability of these routes and services should not be authorised. NE-PS-3 aims to protect these routes and services by enabling and promoting safe, profitable and efficient marine businesses.* *NE-CAB-1: Subsea cabling is important to the growth and sustainability of telecommunications, offshore wind farms and electricity transmission. NE-CAB-1 supports and encourages cable burial where possible, to meet the needs of the sector while enabling co-existence with other users of the north east marine plan areas.*	All marine planning policies for ports, harbours and shipping have been considered fully throughout this ES chapter. Particular regard is given to the displacement of vessel traffic and reduced access to local ports. Mitigation measures have been identified to reduce the effect of such impacts (see section 13.11). The primary means of cable protection is planned to be via burial.

Table 13.2 Summary of legislation relevant to shipping and navigation

Relevant Legislation	Summary of Relevant Legislative Framework	How and Where Considered in the ES
Scotland and England (UK) / International		
United Nations Convention on the Law of the Sea (UNCLOS)	UNCLOS defines the rights and responsibilities of all nations with respect to their use of the sea, throughout the world. Article 60(7) states *"Artificial islands, installations and structures and the safety zones around them may not be established where interference may be caused to the use of recognised sea lanes essential to international navigation".*	UNCLOS is considered fully throughout this ES chapter. Particular regard is given to internationally recognised sea lanes (main commercial routes) which are considered a key element of the shipping and navigation baseline (see section 13.7) and have been considered where relevant as part of the impact assessment (see section 13.12).
Submarine Telegraph Act (UK Government, 1885)	An Act to carry into effect an International Convention for the Protection of Submarine Telegraph Cables. Article II states: *"It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for damages."* *This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their lives or their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable*	This has been taken into consideration in the assessment of impact from vessel anchors or fishing gear (section 13.12)
Convention on International Regulations for Preventing Collisions at Sea (COLREGS)	The COLREGs define the rules which must be adhered to by all vessels navigating internationally. Rule 8 Part (a) states *"Any action taken to avoid collision shall be taken in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship."*	The COLREGs in full are considered throughout this ES chapter with particular regard to collision avoidance (Rule 8) and conduct of vessels in restricted visibility (Rule 19) when considering collision risk in the impact assessment (see section 13.12).

Relevant Legislation	Summary of Relevant Legislative Framework	How and Where Considered in the ES
	Rule 19 Part (b) states *"Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility A power-driven vessel shall have her engines ready for immediate manoeuvre."*	
Chapter V, Safety of Navigation, of the Annex to the International Convention for the Safety of Life at Sea (SOLAS)	SOLAS Chapter V is an international agreement that sets basic minimum criteria for all seafarers, dependent on the size and type of vessel. Regulation 33 states *"The master of a ship at sea which is in a position to be able to provide assistance on receiving a signal from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance, …"*	SOLAS Chapter V in full is considered throughout this ES chapter with particular regard to rendering assistance to persons in distress (Regulation 33) and passage planning (Regulation 34) when considering anchor interaction with subsea cables and emergency response capability (see section 13.12).

13.5. Consultation and Technical Engagement

10. A summary of the key issues raised during consultation and technical engagement activities undertaken to date specific to shipping and navigation is presented in Table 13.3[4] below, together with how these issues have been considered in the production of this shipping and navigation chapter. Further detail is presented within Volume 2, Chapter 4: Stakeholder Consultation and Engagement.

[4] Where scoping comments from stakeholders and consultees have been restated and/or paraphrased by the regulators within Scoping Opinions, this is only referenced with regards to MD-LOT and MMO Scoping Opinions, for brevity and to reduce duplication.

Table 13.3 Summary of key consultation and technical engagement undertaken for the Marine Scheme relevant to shipping and navigation

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
Relevant consultation and engagement undertaken to date			
13 February 2023	MCA – Project Shipping and Navigation Consultation Meeting	Should High Voltage Direct Current (HVDC) transmission infrastructure be used MCA would expect a pre-construction assessment of the expected impact on ships' magnetic compasses. 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-degree deviation will be attained. If this requirement cannot be met, further mitigation measures may be required including a post installation deviation survey of the cable route. This data must then be provided to the MCA and United Kingdom Hydrography Office (UKHO), and a precautionary notation may be required on the appropriate Admiralty Charts regarding possible magnetic anomalies along the cable route.	Potential impacts on magnetic compasses is presented in section 13.12. Noted requirements. As agreed during consultation with the MCA, a compass deviation assessment will be carried out post consent.
		MGN 654 checklist to be completed, noting only relevant fields for cables need to be considered.	This has been completed as part of the NRA (see Volume 3, Appendix 13.1).
		SAR Checklist / full Emergency Response Cooperation Plan (ERCoP) not required. Marine Emergency Action Card (MEAC) is appropriate.	Noted.
		No concerns noted with NRA approach, data sources, mitigations or impacts.	Noted
13 February 2023	Trinity House – Project Shipping and Navigation consultation meeting	No concerns noted other than possible water depth reductions close to Landfall. No requirement for marking of cable with Aid to Navigation.	Potential reduction in under keel clearance is assessed in section 13.12.
13 February 2023	NLB – Project Shipping and Navigation consultation meeting	No concerns noted.	Noted.
13 February 2023	RYA – Project Shipping and Navigation consultation meeting	No concerns based on recreational vessel density.	Noted.
13 February 2023	MCA – Project Shipping and	Noted presence of robotics test site west of Blyth Demonstrator 1 Offshore Wind Farm.	This has been included in baseline environment (see section 13.7).

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
	Navigation consultation meeting		
16 February 2023	Port of Blyth – Project Shipping and Navigation consultation meeting	Historical data from previous wind farm applications would be useful for informing the baseline, for example from the Blyth demonstrator 1 project, noting that wind farm applications require radar surveys to be undertaken.	The Blyth Demonstrator Offshore Wind Farm Phase 1 environmental statement has been reviewed in the analysis of the baseline environment (section 13.7).
16 February 2023	Port of Blyth – Project Shipping and Navigation consultation meeting	Limitations of Automatic Identification System (AIS) data noted for small vessels (fishing and recreational). Approximately 33 fishing vessels based at Blyth with minority on AIS.	These limitations are noted in the baseline assessment (section 13.7). Consultation and sightings data have been used to confirm small vessel activity as outlined in section 13.7.
16 February 2023	Port of Blyth – Project Shipping and Navigation consultation meeting	Usually only a few vessels per month recorded at anchor. Some tracks of anchored vessels presented could be undertaking Dynamic Positioning (DP) trials. Only vessels with draughts exceeding 6.5 m – 7.0 m required to wait on tide.	These tracks were checked and confirmed to be vessels at anchor. The AIS data recorded 22 anchoring events in six months. Further information has been added in the analysis of the baseline environment (section 13.7)
16 February 2023	Chamber of Shipping (CoS) – Project Shipping and Navigation consultation meeting	Minimum proposed target burial depth of 0.5 m could easily be exceeded by an anchor.	Noted. The potential impact of vessel anchors is assessed in section 13.12
16 February 2023	CoS – Project Shipping and Navigation consultation meeting	Queried whether bundling could result in higher magnetic effect.	Potential impacts on magnetic compasses are presented in section 13.12. A desk based magnetic compass deviation assessment will be undertaken on the likely (or worst case) design post consent.
03 March 2023	Cruising Association – email correspondence	Many leisure craft (and small fishing vessels) will not be included within the AIS traffic data.	These limitations are noted in the baseline assessment in section 13.7. Consultation has been undertaken to understand extent of small vessel activity. AIS and Radar data used in the BBWF array area NRA has been reviewed for the array area which is of relevance to the Marine Scheme. A review of AIS and radar data collected for the Blyth Offshore Demonstrator Offshore Wind Farm Phase 1 has also been included.

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
03 March 2023	Cruising Association – email correspondence	It would be interesting to compare the location of the cables and proposed array to the RYA AIS roadmap. Whilst this under records the volume, it tends to be reasonably useful on cruising routes taken (but under-represents local sailing in smaller craft). I suspect quite a few recreational craft on East Coast trips will cross over the cable connection route, but other than a few days when cable laying takes place this should not be an issue. Probably most would pass slightly inside this area heading N-S. Some boats transit from the Forth across the North Sea, but not huge numbers.	The RYA Coastal Atlas has been reviewed to confirm recreational activity, as outlined in section 13.7.
03 March 2023	Cruising Association – email correspondence	Many anchors will penetrate more than 0.5 metres and this could include many recreational craft. I would not encourage recreational boaters to anchor close to cables or within an array but it might be the last resort in an emergency.	Noted. Potential impacts of vessel anchors are assessed in section 13.12.
02 May 2023	Ministry of Defence (MoD) – Project consultation meeting	The MoD confirmed they discussed the Marine Scheme with the Navy during Scoping and there were no concerns raised regarding the Marine Scheme proposals. The MoD agree a condition can be secured with Marine Licences whereby the MoD is notified of construction activities in advance, similar to Notice to Mariners (NtM) although this would be a separate communications process with the MoD. The MoD noted that this is a standard condition.	Noted, this is captured within Volume 2, Chapter 17: Summary of Mitigations and Commitments. The MoD will be included in the distribution list for the Marine Scheme NtMs.
02 May 2023	MoD – Project consultation meeting	The MoD confirmed they do not have additional data on military activity to provide, however acknowledge that the underrepresentation of military vessels is a standard data gap within EIAs and confirmed they do not consider it to be a concern with regards to the impact assessment. The MoD stated that they do not expect baselines to account for military vessels and maritime navigational interest for that reason, and would highlight through Scoping or otherwise if there was activity that needed to be noted for the EIA.	Noted. Limitations of AIS data are presented in section 13.7.
Consultation on the Marine Scheme: Scoping			
23 February 2023	MD-LOT: Scoping Opinion *MCA, UK CoS*	With regards to the proposed study area, the Scottish Ministers are content with the defined 10 nm buffer area surrounding the Proposed Works. This is a view supported by the UK CoS representation and MCA representation.	The Shipping and Navigation Study Area presented in the Scoping Report has been reduced to a 5 nm buffer of the Marine Scheme as 10 nm was included in error and on an overly-precautionary basis (considered excessive for an offshore export cable project). A 5 nm Shipping and Navigation Study Area extending from the Marine Scheme was agreed during consultation with MCA and Chamber of Shipping as outlined above.

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
23 February 2023	MD-LOT: Scoping Opinion *NLB*	The Scottish Ministers are broadly content with the data sources identified at section 13.4 of the Scoping Report to inform the shipping and navigation baseline. The Scottish Ministers would advise however that there is no reference to up to date AIS data and advise the Applicant that this must be used as a key data source for the purposes of the EIA Report. In relation to the baseline environment detailed at section 13.5 of the Scoping Report, the Scottish Ministers advise that the ports of Leith and Rosyth are also associated with a large quantity of shipping impacted by the Proposed Works and must be considered further within the EIA Report. In addition, the Scottish Ministers note a number of additional well-used anchorages centred off Cockenzie and Kirkaldy which must be considered further and direct the Applicant further to the NLB representation in this regard.	Six months of up to date (2021/2022) data has been used to inform the baseline (section 13.6). Locations of key ports, harbours and anchorage areas are identified in the baseline environment (section 13.7) and this information has been taken into consideration in the impact assessment (section 13.12).
23 February 2023	MD-LOT: Scoping Opinion *MCA, UK CoS*	Within Table 13-1 of the Scoping Report the Applicant details the potential impacts to be scoped in and scoped out for further assessment within the EIA Report. The Scottish Ministers are broadly in agreement with the potential impacts to be scoped in and scoped out however, disagree with the scoping out of potential anchor interactions with subsea cables. The Scottish Ministers note that whilst the preferred method of installation of the Proposed Works is burial with protection where required, there may still be instances of potential interactions based on the proposed cable burial depth and advise that this must be scoped into the EIA Report for further assessment, including a burial protection index study and, subject to traffic volumes, an anchor penetration study. This is a view supported by the UK CoS representation and MCA representation. Furthermore, the Scottish Ministers disagree with the scoping out of collision between project vessels and infrastructure and third-party activities and operations (including vessel interaction with subsea cables) during the construction and decommissioning phases. The Scottish Ministers advise that this must be scoped into the EIA Report for further assessment based on the justification that has been provided in Table 13-1. This is a view supported by the MCA representation. Additionally, for the avoidance of doubt, the Applicant must ensure that each of the possible impacts on navigational issues, including routing and effects on shipping, outlined in the MCA representation are addressed within the EIA Report.	Potential anchor interactions with subsea cables are assessed in section 13.12. Suitable cable burial and/or external protection will be informed by a Cable Burial Risk Assessment (CBRA). This has been assumed as designed in mitigation (section 13.11). An indicative cable burial appraisal has been undertaken, and used to inform the impact assessment (section 13.12). Potential collision / allision between project vessels and infrastructure and third-party activities and operations (including vessel interaction with subsea cables) during the construction, operation and maintenance, and decommissioning phases is assessed in section 13.12. Relevant impacts outlined in MCA representation assessed in section 13.12.
23 February 2023	MD-LOT: Scoping Opinion *MCA*	In relation to the proposed designed in mitigation measures, the Scottish Ministers highlight the representation from the MCA in this regard relating to the consideration of appropriate mitigation which must be fully addressed by the	Designed in mitigation measures are described in section 13.11.

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
		Applicant and the completion of a Search and Rescue (SAR) checklist in consultation with the MCA.	No offshore substation platforms or other surface infrastructure are included within the Marine Scheme, therefore a SAR Checklist is not required. This was discussed and agreed during consultation with the MCA (section 13.5).
23 February 2023	MD-LOT: Scoping Opinion *UK CoS, MCA*	The Scottish Ministers agree with the scoping in of cumulative impacts for further assessment within the EIA Report, as per the MCA and UK CoS representations. With regard to transboundary impacts, the Scottish Ministers are content that these can be scoped out further for further assessment within the EIA Report.	Noted. Cumulative impacts are assessed in section 13.14.
23 February 2023	MD-LOT: Scoping Opinion *MCA*	In relation to the proposed EIA methodology, the Scottish Ministers would draw particular attention to the MCA representation and advise that the points raised by the MCA must be considered fully within the EIA Report. In particular, the Scottish Ministers refer the Applicant to the reference to MGN-543 and note that this has now been superseded by MGN-654.	Responses to the MCA's representations are outlined in the rows below.
03 January 2023	MCA: Scoping comments	The EIR should provide detail on the potential impacts of navigational issues for commercial and recreational craft, specifically collision risk, navigational safety, visual intrusion and noise, risk management and emergency response, marking and lighting of site during construction and information to mariners, effect on small craft navigational and communication equipment, and the risk to drifting recreational craft in adverse weather or tidal conditions.	Noted. All relevant impacts assessed are in section 13.2.
03 January 2023	MCA: Scoping comments	The development area carries a significant amount of traffic with a number of important commercial shipping routes to/from UK ports.	Noted. Commercial shipping routes have been characterised in section 13.7.
03 January 2023	MCA: Scoping comments	The Scoping report referenced MGN-543 in Section 13.9 which has been superseded by MGN-654. A Navigational Risk Assessment should be submitted in line with the MGN-654. In addition a MGN-654 checklist from https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping should be submitted.	This was included in error. An NRA has been undertaken and submitted as appendix to this shipping and navigation chapter (Volume 3, Appendix 13.1), in line with MGN-654 guidance. An MGN-654 checklist has been included as appendix to the NRA.
03 January 2023	MCA: Scoping comments	Attention needs to be paid to routing, particularly in heavy weather routeing so that vessels can continue to make safe passage without large-scale deviations. The likely cumulative and in combination effects on shipping should be considered which will be an important issue to assess during the construction phase of this project. It should consider the proximity to other windfarm developments, other infrastructure, and the impact on safe navigable sea room.	No large-scale deviations are expected during cable construction works. Impacts on shipping is assessed in section 13.12 and cumulative impacts are assessed in section 13.14.

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
03 January 2023	MCA: Scoping comments	The MCA notes that a desk-based AIS vessel traffic study is undertaken to the standard of MGN 654 to capture vessels navigating in the study area. We understand that this is in addition to existing data and data collected for the generation assets (Berwick Bank OWF) site specific marine vessel traffic surveys and will be carried out to inform the NRA and EIA for the Cambois Cable connection.	The baseline assessment (section 13.7) has used six months of recent AIS data (2021/2022), which is standard practice for NRAs for subsea cable projects. Additional survey data from the BBWF array area has also been reviewed to identify small craft activity as outlined in section 13.7.
03 January 2023	MCA: Scoping comments	As HVDC cables are being considered a study should be undertaken to establish the electromagnetic deviation, affecting ship compasses and other navigating systems, of the high voltage cable route to the satisfaction of the MCA. The MCA would be willing to accept a three degree deviation for 95% of the cable route and for the remaining 5% of the cable route no more than five degrees should be attained. On receipt of the study, the MCA reserves the right to request a deviation survey of the cable route post installation.	Noted. As agreed during consultation with the MCA, a compass deviation assessment will be carried out post consent and electromagnetic deviation will be minimised through cable design and separation based on the findings.
03 January 2023	MCA: Scoping comments	Particular consideration will need to be given to the implications of the location of any booster station, if installed on SAR resources and ERCoP. The report must recognise the level of radar surveillance, AIS and shore-based VHF radio coverage and give due consideration for appropriate mitigation such as radar, AIS receivers and in-field, Marine Band Very High Frequency (VHF) radio communications aerial(s) (VHF voice with Digital Selective Calling (DSC)). A SAR checklist will also need to be completed in consultation with MCA, as per MGN 654 Annex 5 SAR requirements.	No surface infrastructure is included within the Marine Scheme, therefore ERCoP / SAR Checklist not required. This was discussed during consultation with the MCA (section 13.5). Information on emergency response provided in the NRA.
03 January 2023	MCA: Scoping comments	MGN 654 Annex 4 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. Failure to report the survey or conduct it to Order 1a might invalidate the Navigational Risk Assessment if it was deemed not fit for purpose. On the understanding that the Shipping and Navigation aspects are undertaken in accordance with MGN 654 and its annexes, along with a completed MGN checklist, MCA is likely to be content with the approach.	Hydrographic surveys will be carried out post-construction and final data will be provided to the MCA Hydrography Manager.
03 January 2023	MCA: Scoping comments	MCA content with data sources identified to inform baseline; MCA content with the stakeholders and consultees identified as part of the proposed EIA methodology.	Noted.

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
03 January 2023	MCA: Scoping comments	Although we are content with the scoped in impacts. We also feel Collision between Project vessels and infrastructure and third-party activities and operations (including vessel interaction with subsea cables) should be Scoped In during the construction and Decommissioning phase. As the justification in Table 13-1 itself says clearly the presence of project related vessels during the construction and decommissioning phases of the Marine Scheme has the potential to increase the risk of collision with third-party vessels. We also believe Potential anchor interactions with subsea cables should be scoped in as the majority of the cable route is within anchoring depth and there will always be a risk of anchor interaction, and this should be assessed within the EIA.	These impacts have been scoped in and assessed in section 13.12.
03 January 2023	MCA: Scoping comments	Likely cumulative and in combination effects on shipping should be considered which will be an important issue to assess during the construction phase of this project	Cumulative effects are assessed in section 13.14.
03 January 2023	MCA: Scoping comments	We believe there is less transboundary impacts on shipping and navigation receptors that arise as a result of construction, operation and maintenance and decommissioning activities.	Transboundary impacts have been scoped out.
03 January 2023	MCA: Scoping comments	MCA content with the proposed approach to EIA methodology, as long as they are compliant with the above-mentioned statements and MGN 654 guidance.	Noted.
29 November 2022	NLB: Scoping comments	Within Section 15.5.2.3 – Fishing Vessels and Section 15.5.2.3 – Recreational Vessels, NLB would suggest that AIS is a poor tool for assessing vessel density, as it is only carried by a minority of recreational vessels and larger fishing vessels, and as such, a large proportion of recreational traffic and smaller fishing vessels are not captured in this data set.	Consultation has been undertaken with RYA (online meeting) and the Cruising Association (via email) to identify small recreational craft activity. Sightings data and information from commercial fisheries used to identify small fishing vessel activity. Review of AIS and Radar data for BBWF array area and for Blyth Demonstrator Offshore Wind Farm Phase 1 also included (section 13.7).
29 November 2022	NLB: Scoping comments	Northern Lighthouse Board also wish to highlight that part of the proposed export cable route and Landfall position are within the jurisdiction of Trinity House (GLA	Consultation with Trinity House has been carried out as part of the NRA process, as outlined in this table (above).

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
		for England, Wales and the Channel Islands), and as such, should also be consulted with regard to this Scoping Report.	
December 2022	RYA Scotland: Scoping comments	RYA Scotland confirmed that they are happy that recreational boating be scoped out of the Scottish element of the route. Rather few recreational vessels will pass through the area and cable laying is covered by COLREGs, with which all seafarers are expected to be familiar.	Noted.
December 2022	Chamber of Shipping: Scoping comments	The Chamber has reviewed the key data sources listed under 13.4 and finds no reference to up to date AIS data. This is a concern and need addressing. The Chamber recommends that anchoring activity close in shore to Blyth be particularly examined as charted anchorage areas do not necessarily represent real world activity.	Six months recent AIS data (2021/2022) has been used to characterise baseline shipping and all anchoring activity in the Shipping and Navigation Study Area, including anchoring close to Blyth, and is presented in baseline assessment (section 13.7).
November 2022	Forth Ports: Scoping comments	No comment from Forth Ports.	Noted.
14 March 2023	MMO: Scoping Opinion	The ES should supply detail on the potential impact on navigational issues for both commercial and recreational craft, specifically collision risk, navigational safety, visual intrusion and noise, risk management and emergency response, marking and lighting of site during construction and information to mariners, effect on small craft navigational and communication equipment, and the risk to drifting recreational craft in adverse weather or tidal conditions.	Relevant impacts assessed in section 13.12.
14 March 2023	MMO: Scoping Opinion	The development area carries a significant amount of traffic with a number of important commercial shipping routes to/from UK ports. You have referred to MGN 543 within section 13.9 of the scoping report, this document is now superseded by MGN 654. A Navigational Risk Assessment should be submitted in accordance with MGN 654. This should be accompanied by a detailed MGN 654 Checklist which can be found at: https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping	Commercial shipping routes have been characterised in section 13.7. This was included in error. A NRA has been undertaken and submitted as appendix to this shipping and navigation chapter (Volume 3, Appendix 13.1), in line with MGN-654 guidance. An MGN-654 checklist has been included as appendix to the NRA.
14 March 2023	MMO: Scoping Opinion	Attention needs to be paid to routing, particularly in heavy weather routing so that vessels can continue to make safe passage without large-scale deviations. The likely cumulative and in combination effects on shipping should be considered which will be an important issue to assess during the construction phase of this project. It should consider the proximity to other windfarm developments, other infrastructure, and the impact on safe navigable sea room.	No large-scale deviations are expected during cable construction works. Potential impacts on shipping are assessed in section 13.11 and cumulative impacts in section 13.13.

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
14 March 2023	MMO: Scoping Opinion	A desk-based AIS vessel traffic study is undertaken to the standard of MGN 654 to capture vessels navigating in the study area, this is in addition to existing data and data collected for the generation assets (Berwick Bank OWF) site specific marine vessel traffic surveys and will be carried out to inform the NRA and EIA for the Cambois Cable connection.	The baseline assessment (section 13.7) has used six months of recent AIS data (2021/2022), which is standard practice for NRAs for subsea cable projects. Additional survey data from the BBWF array area has also been reviewed to identify small craft activity as outlined in section 13.7.
14 March 2023	MMO: Scoping Opinion *MCA*	Attention should be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and subject to the traffic volumes, an anchor penetration study may be necessary. If cable protection measures are required e.g. rock bags or concrete mattresses, the MCA would be willing to accept a 5% reduction in surrounding depths referenced to Chart Datum. This will be particularly relevant where depths are decreasing towards shore and potential impacts on navigable water increase, such as at the HDD location.	Suitable cable burial and/or external protection will be informed by a CBRA. This has been assumed as designed in mitigation (section 13.10). Following surveys, if areas are identified where external protection is required and the MCA condition of no more than 5% reduction in water depth is exceeded, a location specific review of impacts to shipping will be undertaken and consultation with the MCA will be carried out. Any reduction in navigable water depth greater than 5% will be discussed with the MCA and NLB as per MGN 654.
14 March 2023	MMO: Scoping Opinion *MCA*	As HVDC cables are being considered a study should be undertaken to establish the electromagnetic deviation, affecting ship compasses and other navigating systems, of the high voltage cable route to the satisfaction of the MCA. The MCA would be willing to accept a three-degree deviation for 95% of the cable route and for the remaining 5% of the cable route no more than five degrees should be attained. On receipt of the study, the MCA reserves the right to request a deviation survey of the cable route post installation.	Noted. As agreed during consultation with the MCA, a compass deviation assessment will be carried out post consent and electromagnetic deviation will be minimised through cable design and separation based on the findings.
14 March 2023	MMO: Scoping Opinion	Particular consideration will need to be given to the implications of the location of any booster station, if installed on SAR resources and ERCoP. The report must recognise the level of radar surveillance, AIS and shore-based VHF radio coverage and give due consideration for appropriate mitigation such as radar, AIS receivers and in-field, Marine Band VHF radio communications aerial(s) (VHF voice with DSC). A SAR checklist will also need to be completed in consultation with MCA, as per MGN 654 Annex 5 SAR requirements.	No surface infrastructure is included within the Marine Scheme, therefore ERCoP / SAR Checklist not required. This was discussed during consultation with the MCA (section 13.5). Information on emergency response provided in the NRA.
14 March 2023	MMO: Scoping Opinion	MGN 654 Annex 4 requires that hydrographic surveys should fulfil the requirements of the IHO Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager.	Hydrographic surveys will be carried out post-construction and final data provided to the MCA Hydrography Manager.

Date	Consultee and Type of Consultation	Issue(s) Raised	Response to Issue Raised and/or Where Considered in this chapter
		Failure to report the survey or conduct it to Order 1a might invalidate the Navigational Risk Assessment if it was deemed not fit for purpose. On the understanding that the Shipping and Navigation aspects are undertaken in accordance with MGN 654 and its annexes, along with a completed MGN checklist, The MMO in consultation with the MCA is likely to be content with the approach.	
14 March 2023	MMO: Scoping Opinion	An assessment of impact on existing aids to navigation, to include both offshore and shore based (where any cabling reaches Landfall) aids to navigation.	Consultation has been carried out with NLB and Trinity House (as outlined above) and no issues were raised. Noted there is only one buoy within the Offshore Export Cable Corridor, marking the shallow waters at Berwick Bank (in Scottish Waters). Discussions with NLB will be carried out if there is any requirement to move this buoy, however no safety to navigation is anticipated.
14 March 2023	MMO: Scoping Opinion	If it will be necessary for the cables to be protected by rock armour, concrete mattresses or similar protection which lies clear of the surrounding seabed, the impact on navigation and the requirement for appropriate risk mitigation measures needs to be assessed.	Impact of reduced under keel clearance assessed in section 13.11.

13.6. Methodology to Inform Baseline

13.1.1 Desktop Study

11. Information on shipping and navigation within the Shipping and Navigation Study Area was collected through a detailed desktop review of existing studies and datasets.

12. These are summarised in Table 13.4 below. The desktop study was supplemented with information provided during stakeholder consultation, as detailed in Table 13.3 Summary of key consultation and technical engagement undertaken for the Marine Scheme relevant to shipping and navigation.

Table 13.4 Summary of key desktop studies & datasets

Title	Source	Year
Six months (three months summer and three months winter) of AIS Data	Anatec	November 2021 to January 2022; May to July 2022
28 days (summer and winter) vessel traffic data from BBWF EIAR Shipping and Navigation chapter (BBWFL, 2022)	Anatec	January 2021; August 2022
Admiralty nautical charts 1407, 273, 1192, 2182B	UKHO	2022
Admiralty Sailing Directions North Sea (West) Pilot NP54	UKHO	2022
GIS for wind farms within England	The Crown Estate (TCE)	2022
GIS for wind farms within Scotland	Crown Estate Scotland	2022
Marine Accident and Investigation Branch (MAIB) incident data	MAIB	2010-2019
Royal National Lifeboat Institution (RNLI) incident data	RNLI	2010-2019
UK Coastal Atlas of Recreational Boating	RYA	2019
UK ports: ship arrivals	Department for Transport (DfT)	2017-2021
Vessel Monitoring System (VMS) satellite fishing data 2019 and 2020	MMO	2019/2020
Anonymised Fishing Sightings Data	Northumberland Inshore Fisheries and Conservation Authority (NIFCA)	2012-2021
Blyth Demonstrator Offshore Wind Farm Phase 2 – Supporting Environmental Information	EDF Renewables	2020
Blyth Demonstrator Offshore Wind Farm Environmental Statement	Natural Power	2012

13.1.2 Site-specific Surveys

13. AIS and radar data was collected for the BBWF array area and Offshore Export Cable Corridor into Branxton, East Lothian. This informed the EIA Report Shipping and Navigation chapter (BBWFL, 2022) and has also been used to inform the shipping and navigation baseline for the Marine Scheme. Due to the nature and scale of the Marine Scheme, no further site-specific surveys have been undertaken to inform the EIA for shipping and navigation. This was agreed with key stakeholders as part of discussions on NRA approach (see Table 13.3) and through scoping.

13.7. Baseline Environment

13.1.3 Overview of Baseline Environment

13.1.4 Navigational Features

14. A plot of navigational features in proximity to the Marine Scheme is presented in Volume 4, Figure 13.2. Details of the key navigational features are provided in Table 13.5. Individual charts of key navigational features are presented in the NRA, as well as a more detailed chart showing the navigational features close to the Landfall.

Table 13.5 Key Navigational Features

Navigational Feature	Details
Ports and harbours	**Scotland** The Marine Scheme is located 33 nm to the east of the entrance to the Firth of Forth in Scottish waters. Vessels visiting Forth Ports (e.g. Leith, Rosyth, Grangemouth) are expected to contribute a significant proportion of shipping crossing the Marine Scheme in Scottish waters. **England** The closest port to the Marine Scheme is the Port of Blyth, the entrance of which is located 1.4 nm south of Landfall in English waters. The territorial waters section of the Marine Scheme in English waters lies just outside of the Seaward Limit of Blyth Harbour Commission at its Landfall. A dredged channel leads into Blyth with a depth of 8.5 m, although it is noted that the dredged depths presented on charts are liable to change. Pilotage at Blyth is compulsory for vessels over 50 m length overall, and for vessels with tows when the combined length of tow exceeds 50 m. The pilot boarding area for Blyth is not charted, however Admiralty Sailing Directions state that the pilot normally boards within 2 nm of the harbour entrance. In worse weather, the pilots board in the vicinity of the pierheads. Vessels visiting Forth Ports are also likely to be crossing the northern parts of the Marine Scheme within English waters.
Anchorage areas	**Scotland** Several reported anchorages are charted along the coastline, with the closest to the Marine Scheme in Scottish waters being approximately 21 nm to the south-east, close to shore at Eyemouth. **England** The closest anchorage to the Marine Scheme in English waters is located 2.5 nm south, outside the Port of Blyth. The anchorage is located east of the East Pierhead and has a depth of approximately 17 m.
Military practice areas	**Scotland** Two submarine exercise areas (X5641: Firth of Forth Middle and X5642: Firth of Forth Outer) are present at the northern extent of the Marine Scheme in Scottish waters, although the boundaries of these are not charted. **England** Approximately 26 nm of the mid-section of the Marine Scheme crosses one firing practice area in English waters (as detailed further in Volume 2, Chapter 15: Other Sea Users). No restrictions are placed on the right to transit the firing practice areas at any time. The firing

Navigational Feature	Details
	practice area are operated using a clear range procedure; exercises and firing only take place when the areas are considered to be clear of all shipping.
Offshore wind farms	**Scotland** The Marine Scheme in Scottish waters directly overlaps with the BBWF array area and BBWF Branxton Connection (Volume 4, Figure 15.2). As discussed in Volume 2, Chapter 1: Introduction, the BBWF is currently being determined separately. Other nearby wind farms include the under-construction Seagreen OWF, Farm, 2.7 nm to the north of the Marine Scheme in Scottish waters. The consented Seagreen 1A project adds an additional cable corridor to the Seagreen OWF, with a landfall at Cockenzie. The Seagreen 1A boundary does not intersect the Marine Scheme. The consented Inch Cape OWF is located 4.2 nm to the north-east, with the under-construction Neart na Gaoithe (NNG) OWF 8.4 nm to the west of the Marine Scheme in Scottish waters. **England** The closest operational offshore wind farm to the Marine Scheme is the Blyth Offshore Demonstrator Wind Farm (hereafter 'Blyth Demo Phase 1) in English waters. The Blyth Demo Phase 1 consisting of five turbines, is located 1.1 nm (2 km) south of the Marine Scheme and was fully commissioned in 2018. Phase 2 of the Blyth Demonstrator Offshore Wind Farm (Blyth Demo Phase 2) has now been consented and site boundaries are located 0.3 nm north and 1.1 nm south. The Blyth Wind Farm, located 0.5 nm to the south of the Marine Scheme in English waters has been decommissioned. There is also an offshore wind robotics test site located in the River Blyth, inshore of the decommissioned wind farm.
Cables and pipelines	**Scotland** The Scotland England Green Link 1 (SEGL1) and Eastern Green Link 2 (EGL2) transmission cables are currently in planning and if consented will overlap with the Shipping and Navigation Study Area. Neither cable is planned to cross the Marine Scheme in Scottish waters, with EGL2's planned route lying approximately 2.2 nm to the east at the closest approach. **England** The Marine Scheme overlaps with two operational power cables at the Landfall in English waters: the North Sea Link interconnector which runs between Cambois and Kvilldal, Norway and the Blyth Demo Phase 1 export cable. Both these cables are crossed by the Marine Scheme in English waters. The NO-UK and Havhingsten telecommunication cables also overlap the Shipping and Navigation Study Area, but are outside the Marine Scheme in both English and Scottish waters. SEGL1 runs from Torness in East Lothian, Scotland to Hawthorn Pit in Durham, England, while EGL2 runs from Peterhead in Aberdeenshire, Scotland to Drax in North Yorkshire, England. SEGL1, if consented, would cross the Marine Scheme in English waters.
Aid to Navigation (AtoN)	**Scotland** There are four scientific buoys marked with AtoNs within the part of the Marine Scheme that overlaps the BBWF array area in Scottish waters, and a further buoy at the south-east corner of the BBWF array area situated to the east of Berwick Bank. This buoy marks the edge of the shallow waters of the bank. The southern edge of the Seagreen Offshore Wind Farm (OWF) is also marked with construction buoyage, as is the NNG OWF site. **England**

Navigational Feature	Details
	The closest AtoN to the Marine Scheme in English waters is the Blyth Harbour Lighthouse, located 1.8 nm to the south of the Marine Scheme close to the Landfall.

13.1.5 Vessel Traffic Movements

15. Vessel traffic movements for the Shipping and Navigation Study Area were identified from six months of AIS data, covering the following two periods:

- 1st November 2021 to 31st January 2022 (winter 2021/22 period); and
- 1st May to 31st July 2022 (summer 2022 period).

16. A plot of vessel traffic data from the winter 2021/22 period recorded within the Shipping and Navigation Study Area, colour coded by vessel type, is presented in Volume 4, Figure 13.3. Following this, the vessel traffic data from the summer 2022 period is presented in Volume 4, Figure 13.4. A number of the vessel tracks recorded were classified as temporary (non-routine), such as the tracks of the vessels undertaking surveys. These have therefore been excluded to ensure the analysis is not skewed and gives a fair representation of normal vessel traffic movements in the area.

17. Plate 13.1 presents the number of vessels within the Shipping and Navigation Study Area and crossing the Marine Scheme (in both Scottish and English waters) per month, based on unique vessels per day.

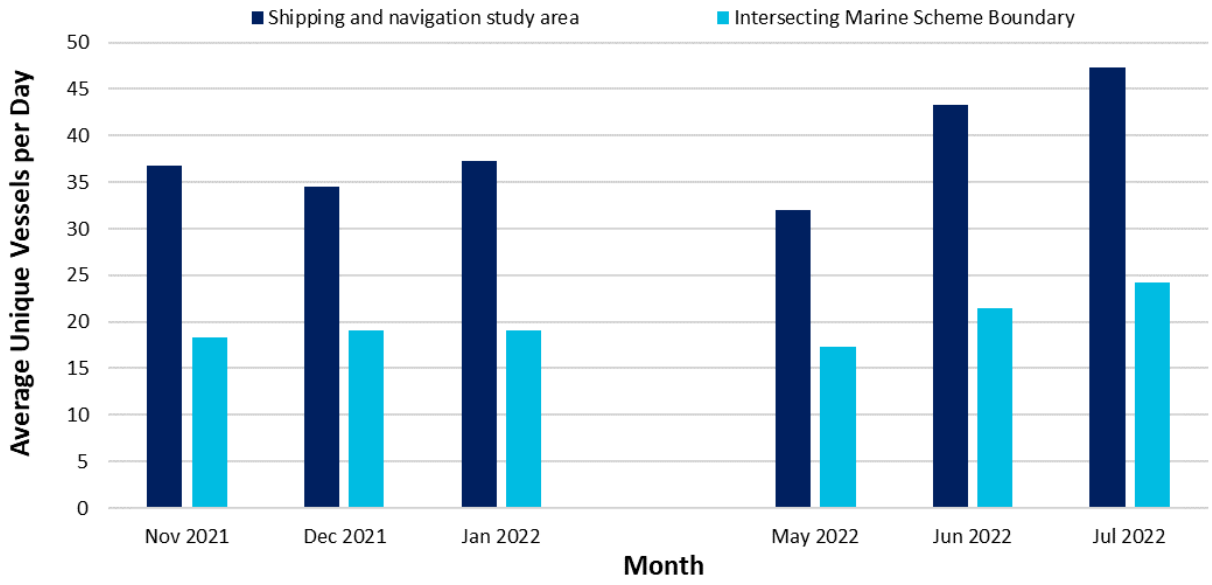

Plate 13.1 Average Daily Vessel Count per Month (Six Months)

18. There was an average of 38 unique vessels per day[5] within the Shipping and Navigation Study Area during winter and 41 per day during summer. July 2022 was the busiest month with an average of 47 unique vessels per day. During the three month winter period, an average of 19 unique vessels per day crossed the Marine Scheme (in both Scottish and English waters), and an average of 21 unique vessels per day in summer. The slight difference overall between summer and winter can mainly be accounted for by the higher recreational vessel activity in summer.

19. Vessel density figures are provided in the NRA (Volume 3, Appendix 13.1). Within Scottish waters, the higher density areas are recorded to the west of the Marine Scheme boundary, associated with tankers and cargo vessels on north/south transits. Routes used by cargo vessels and tankers visiting Grangemouth and other ports within the Firth of Forth are also relatively high density. Further south, within English waters, higher density is again recorded where north/south routes used by cargo vessels and tankers cross the Marine Scheme Boundary close to Blyth. Nearshore fishing activity close to the Landfall also contributes to the high density region near Blyth. Lower density areas can be seen further offshore, particularly in the eastern extent of the Marine Scheme in both Scottish and English waters. It is likely that the higher density close to the Landfall in winter is due to increased fishing activity. Further details on commercial fishing activity are provided in Volume 2, Chapter 12: Commercial Fisheries.

20. The most common vessel type recorded within the Shipping and Navigation Study Area was fishing vessels which accounted for 23% of the overall distribution, followed by tankers (22%) and cargo vessels (20%). These vessels were common in both Scottish and English waters. The remainder of the traffic included recreational vessels, pilot vessels, dredgers and tugs. Dredgers were mostly recorded in the vicinity of Blyth in English waters, however, were also recorded in the north of the Shipping and Navigation Study Area in Scottish waters.

21. An average of eight to nine tankers per day and seven to eight cargo vessels per day were recorded during the six month period. A high volume of cargo and tanker traffic in the Shipping and Navigation Study Area was observed particularly on north/south transits, with common destinations including Aberdeen, Grangemouth and Immingham, as well as destinations in mainland Europe such as Rotterdam, Netherlands and Antwerp, Belgium. Vessels on these routes crossed the Marine Scheme generally within English waters, although vessels were also recorded following these routes on the western edge of the Marine Scheme in Scottish waters. Cargo vessels and tankers were also seen within the north of the Shipping and Navigation Study Area within Scottish waters travelling to/from the Firth of Forth, with a number of vessels recorded passing through the northern extent of the Marine Scheme boundary.

22. The average vessel length recorded in the Shipping and Navigation Study Area was 76 m during both summer and winter. The largest vessel recorded during either period was a 336 m crude oil tanker. Smaller vessels were recorded closer to the coast, particularly in proximity to the Landfall in English waters, while larger vessels were seen transiting to/from the Firth of Forth in Scottish waters.

23. The average vessel draught recorded in the Shipping and Navigation Study Area during winter was 5.3 m, and in summer 5.5 m. Shallower draught vessels (recreational craft and fishing vessels) are likely under-represented in the AIS data, and the average draught is therefore likely to be an over-estimate. Vessels with shallow draughts (under 3 m) were mainly recorded close to the coast at the

[5] Vessels are only counted once per day in order to avoid over-counting of vessels due to exiting and re-entering the Shipping and Navigation Study Area or broken AIS tracks

Landfall in English waters. The vessels with deeper draughts (over 7 m) were mainly recorded travelling to/from ports in the Firth of Forth in Scottish waters. Vessels with deep draught were also recorded in the vicinity of the Landfall in English waters, recorded entering and exiting Blyth. These included cargo vessels of approximately 9 m draught, and a crane ship working on the NNG OWF with a draught of approximately 11 m.

24. An average Dead Weight Tonnage (DWT) of 7,970 tonnes (t) was recorded in winter and an average DWT of 6,240 t was recorded in summer. A significant proportion (38% in winter and 41% in summer) were identified or estimated to have a DWT less than 100 t. The largest vessel was a crude oil tanker with a DWT of 320,785 t.

25. The average vessel speed recorded in the Shipping and Navigation Study Area was 7.0 knots in winter and 6.9 knots in summer. The fastest vessel recorded was a fisheries patrol vessel travelling at 28.5 knots. Vessels travelling at higher speeds were generally transiting further offshore, mainly to/from the Firth of Forth in Scottish waters. Fishing vessels were observed within the south of the Shipping and Navigation Study Area, within English waters, travelling at speed of under six knots, which indicates that they may be engaged in fishing activity.

26. The majority of anchored vessels recorded in the Shipping and Navigation Study Area were associated with the charted anchorage area close to the Port of Blyth in English waters, although a few vessels were noted to anchor in the BBWF array area section of the Marine Scheme in Scottish waters. Vessels deemed to be at anchor were identified via a combination of navigation status, speed and behaviour. The majority of anchored vessels were cargo vessels (45%), 'other' vessels (23%), tankers (13%) and oil & gas vessels (11%). Consultation with the Port of Blyth indicated that usually only a few vessels per month are recorded at anchor and that only vessels with draughts exceeding 6.5 m – 7.0 m are required to wait on tide. These vessels were generally recorded at anchor close to shore at Blyth, to the south of the Marine Scheme Landfall in English waters. Based on the vessel traffic data, there were 26 anchoring events in six months, with some vessels remaining at anchor over several days.

27. The majority of recreational traffic was recorded in proximity to the coast, with vessels recorded transiting to/from Blyth Harbour, as well as vessels transiting north/south within the Shipping and Navigation Study Area These north/south routes cross the Marine Scheme generally within English waters, with some vessels also recorded on the western edge of the Marine Scheme in Scottish Waters. A significant number of recreational vessels were recorded within the north of the Shipping and Navigation Study Area, within the part of the Marine Scheme which overlaps the BBWF array area in Scottish waters. There was an average of one unique vessel per day recorded over the winter period and an average of six vessels per day during the summer period. Excluding vessels with unspecified lengths, the average length of recreational vessels within the Shipping and Navigation Study Area was 11.4 m. The RYA Coastal Atlas (RYA, 2019b) shows that there is a generally low level of recreational activity along the section of coastline close to the Marine Scheme in English waters, with higher levels of activity concentrated at the ports and harbours in the area. There is a higher level of recreational activity close to the cable Landfall north of Blyth in English waters.

28. Consultation with recreational user groups indicated that quite a few recreational craft on east coast trips would cross over the Marine Scheme. Most recreational craft on north-south transits are expected to pass slightly inshore of the BBWF array area section of the Marine Scheme in Scottish waters. Recreational vessels may therefore cross the Marine Scheme boundary within English waters close to the Landfall, as recreational vessels tend to stay close to shore. Some vessels were noted to transit to/from the Firth of Forth across the North Sea in Scottish waters, but in limited numbers.

29. It is noted that recreational craft and small fishing vessels less than 15 m in length will be under-represented due to AIS carriage requirements. In addition, there may be some loss of coverage further offshore, especially in the winter period, due to the range obtained from the terrestrial AIS receivers.

30. Fishing activity was recorded on AIS during the study period throughout the majority of the Shipping and Navigation Study Area, with a higher level of activity recorded in English waters, largely by demersal (otter) trawlers. Potters/ whelkers and demersal trawlers accounted for the majority of the fishing activity recorded in the north of the Shipping and Navigation Study Area in Scottish waters. An average of 11 fishing vessels per day was recorded in the Shipping and Navigation Study Area in winter, compared to seven per day in summer. The most frequently recorded gear type in the Shipping and Navigation Study Area was demersal trawler (51%), followed by potter/ whelker (33%). This aligns with the baseline environment presented in Volume 2, Chapter 12: Commercial Fisheries, which reports that the main fishing types in Scottish Waters are scallop dredging, lobster/crab creeling and demersal trawling, while in English waters the main types are demersal *Nephrops* trawling, lobster/crab potting and scallop dredging.

31. It was noted during consultation that approximately 33 fishing vessels are based at Blyth with the minority of these using AIS.

32. The average length of fishing vessels on AIS was 16.5 m. Approximately 59% of vessels were less than 15 m in length and hence carrying AIS voluntarily. Over 99% of the fishing vessels recorded during the six month AIS period were UK registered. German, Polish and Danish vessels each accounted for less than 1%.

33. The average fishing vessel speed recorded on AIS in the area was 4.9 knots. Overall, 69% of vessel speeds were below six knots and therefore could be actively fishing.

34. VMS fishing satellite data for 2019 and 2020 showed a strong correlation with the AIS data, with fishing sightings recorded mainly in the south of the Shipping and Navigation Study Area in English waters.

35. Fishing vessel sightings data spanning 2011-2021 was also provided. The data covers all fishing vessels within line of sight, regardless of size. The data revealed that the majority of fishing activity in the area is made up of potters fishing for lobster or crab. Less common fishing activity included trawling, Norway lobster (*Nephrops*) potting and recreational angling. During the data period, 25 fishing vessel sightings within the Marine Scheme in English waters were recorded, with 18 of these being lobster/crab potting, four trawlers and three recreational angling boats. Fishing vessel sightings were predominantly recorded close to shore, with 1% of sightings recorded further than 12 nm offshore, with 95% recorded within 6 nm of the coast.

36. Vessel traffic survey data (AIS, radar and visual observations) was collected to inform the BBWF EIAR Shipping and Navigation chapter (BBWFL, 2022), with 14 days in Winter 2021 and a further 14 days in Summer 2022 collected to capture seasonal traffic variations. The data from the combined 28 days of surveying is presented in Volume 4, Figure 13.5, colour-coded by vessel type, for a 10 nm buffer around the part of the Marine Scheme which overlaps the BBWF array area in Scottish waters. An average of 14 vessels per day were recorded within the area, with the main vessel types being tankers (31%) and cargo vessels (30%), followed by fishing vessels (12%). Some fishing vessel activity was recorded within the BBWF array area.

37. In addition to project specific vessel traffic data, survey data collected to inform Blyth Demo Phase 1 project is publicly available (Natural Power, 2012). The data for the survey encompasses AIS, radar and visual observation data collected from 9th – 23rd January and 29th June -14th July 2011,

with the area surveyed lying close to the Landfall for the Marine Scheme in English waters. The survey data did not provide any further information on small vessel activity close to the Landfall. More recent AIS data used to inform the Blyth Demo Phase 2 has also been reviewed (EDF Renewables, 2020), covering 1st – 14th August 2019 and 1st – 14th January 2019. The report notes that in addition to the fishing vessels based in Blyth, additional *Nephrops* fishing boats also typically land their catch in Blyth from November to February each year, during the peak season for *Nephrops* fishing.

13.1.6 Summary of Baseline and Key Receptors for Assessment

Table 13.6 Summary and key receptors for shipping and navigation

Receptor	Location / Jurisdiction	
	Scotland	England
Commercial vessels	✓	✓
Fishing vessels	✓	✓
Recreational vessels	✓	✓
Anchored vessels	✓	✓
Dredgers	✓	✓
Ports and Harbours	✓	✓

13.1.7 Emergency Response Resources and Historical Maritime Incidents

38. A plot of emergency response resources in proximity to the Scottish and English sections of the Marine Scheme is presented in Volume 4, Figure 13.6. Details of the emergency response resources are provided in Table 13.7.

Table 13.7 Details of Emergency Response Resources

Emergency Response Resource	Details
SAR helicopters	The SAR helicopter service is operated by the Bristow Group on behalf of the HMCG from 10 base locations around the UK, with the closest to the Marine Scheme in Scottish waters located at Prestwick (107 nm to the east) and the closest to the Marine Scheme in English waters located at Humberside (101 nm to the south).
RNLI stations	The RNLI operate out of more than 230 stations around the UK, with the closest to the Marine Scheme located at Blyth (1 nm to the south, in English waters).
His Majesty's Coastguard (HMCG)	HMCG coordinates SAR operations through a network of nine Maritime Rescue Coordination Centres (MRCC), a Maritime Rescue Sub Centre (MRSC) and the Joint Rescue Coordination Centre (JRCC). The closest MRCCs to the Marine Scheme in Scottish waters is located at Aberdeen (54 nm to the north) and the closest to the Marine Scheme in English waters is located at the Humber (78 nm to the south-east).

39. A plot of the locations of accidents, injuries and hazardous incidents reported to the MAIB within the Shipping and Navigation Study Area between 2010 and 2019 is presented in Volume 4, Figure 13.6.

40. An average of four incidents per year was reported by the MAIB within the Shipping and Navigation Study Area between 2010 and 2019. Incidents were mainly recorded close to shore in English waters. The most frequently recorded incident types (excluding one 'other' incident) were machinery failure (46%) followed by accident to person (20%). Vessels frequently involved in maritime incidents were fishing vessels (54%) and 'other commercial' vessels (18%). Two incidents took place within the Marine Scheme close to the Landfall in English waters. One incident involved a fishing vessel suffering machinery failure and one was an 'other' incident. The 'other' incident was a minor contact between a SAR vessel and the quay during berthing, which did not result in significant damage.

41. An average of 31 incidents per year was responded to by the RNLI within the Shipping and Navigation Study Area between 2010 and 2019, the majority of which were within 3 nm of the coast in English waters. Person in danger (38%) was the most frequently recorded incident type in the Shipping and Navigation Study Area, followed by machinery failure (36%). The most common incident type recorded in the entire Shipping and Navigation Study Area involved a person in danger (38%) rather than a vessel fault. Following this, the most common type of vessel involved was recreational vessels (24%) and fishing vessels (17%). 11 incidents took place within the Marine Scheme, with the majority of these close to the Landfall in English waters.

13.1.8 Future Baseline Scenario

42. An assessment of the future baseline conditions has been carried out and is described within this section.

43. In relation to the current baseline, it is anticipated that commercial vessel traffic will navigate around the Blyth Demo Phase 2, which could impact vessel routeing near the Landfall in English waters. In addition, the construction of the BBWF could alter vessel routeing at the northern section of the Marine Scheme in Scottish waters, as commercial vessels are expected to navigate around the wind farm. In line with industry experience, vessels will typically maintain a minimum mean distance of 1 nm from future wind farm structures, and therefore vessels currently transiting east/west through the southern extent of the BBWF array area are anticipated to cross the Marine Scheme

at a mean position of approximately 1 nm to the south of the most southerly Wind Turbine Generators (WTGs) in Scottish and English waters.

44. In order to inform any changes to vessel traffic volumes, a brief review of vessel traffic calling at major ports relevant to the area was carried out to determine the trends in shipping in the past years. Typical destinations broadcast by commercial vessels within the Shipping and Navigation Study Area included Blyth and Immingham, in English waters, and Grangemouth and Aberdeen in Scottish waters. The port arrival statistics from 2017 – 2021 are displayed in Plate 13.2. It is noted that Grangemouth is part of Forth Ports, who are the harbour authority for ports within the Firth of Forth, while Immingham statistics are also combined with the nearby Port of Grimsby.

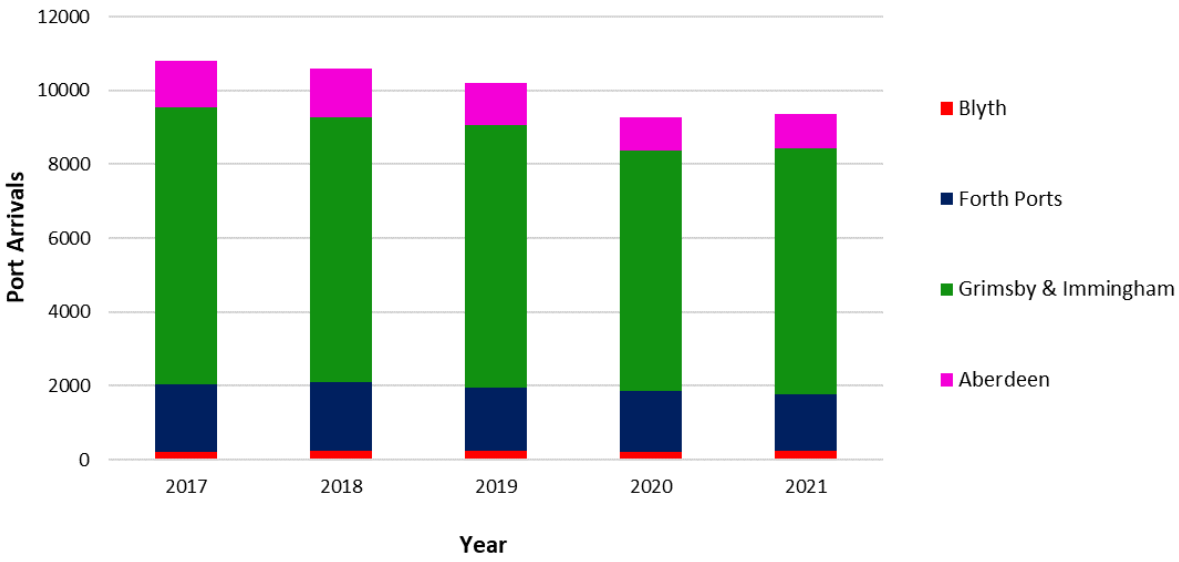

Plate 13.2 Port Arrivals 2017 - 2021 (DfT, 2022)

45. From 2017 to 2019 (pre-COVID-19 pandemic) the port arrivals remained constant for the Port of Blyth and Forth Ports. A slight decrease was observed for the ports of Grimsby and Immingham, as well as Aberdeen. Blyth and Aberdeen had the biggest reductions in 2020 (likely due to Brexit and/or the COVID-19 pandemic), with a 23% decline in arrivals for Aberdeen and 14% for Blyth.

46. The most common commercial vessel destination within the Shipping and Navigation Study Area was the Port of Blyth, which is currently undergoing major redevelopment works at one of its terminals. The Battleship Wharf Terminal at the Port of Blyth is increasingly used for wind farm mobilisations and project cargos, as well as handling dry bulk and breakbulk cargoes. Vessel traffic at the Port of Aberdeen is estimated to increase compared to the baseline, as the first commercial vessel visiting the new South Harbour was in summer 2022. The South Harbour is a multipurpose harbour and will accommodate various vessel types including oil and gas support, wind farm support, cargo, passenger and tanker. No terminal or berth changes, or additional commercial ferry routes, related to Forth Ports are planned. It is noted that in January 2023, the Firth of Forth, including Forth Ports, was selected to become one of Scotland's first Green Freeports.

47. Other common destinations of commercial vessels were ports in mainland Europe such as Rotterdam, Netherlands and Antwerp, Belgium. Rotterdam is undergoing development to increase container capacity, expected to be completed by 2030. No major redevelopments which would be expected to impact the Shipping and Navigation Study Area are anticipated at Antwerp. Port arrivals at Rotterdam and Antwerp have returned to pre-COVID levels, though container throughput dropped from 2021 to 2022 due to the war in Ukraine. It is noted that developments at such distant

ports may not influence traffic patterns in the Shipping and Navigation Study Area, as these are major international ports with routes to destinations around the world, only a few of which pass through the Shipping and Navigation Study Area.

48. Fishing activity is significant within 3 nm of the coast, with a lower level of activity recorded further offshore. Fishing trends are difficult to predict and can depend on various influencing factors such as fish stocks, quotas, etc. Fishing activity could change significantly due to the changes in legislation post-Brexit, as detailed further in Volume 2, Chapter 12: Commercial Fisheries. It is expected that fishing by EU vessels within UK waters will reduce, with fishing rights being transferred to UK vessels.

49. Recreational activity may remain similar or increase slightly in future years, due to population growth and longer life expectancies, which means people have more leisure time. However, this can also be impacted by factors such as weather and economy.

13.1.9 Data Assumptions and Limitations

13.1.9.1 AIS DATA

50. It is assumed that vessels under an obligation to broadcast information via AIS have done so, across all vessel traffic datasets. It has also been assumed that the details broadcast via AIS (such as vessel type and dimensions) are accurate unless clear evidence to the contrary was identified. There may be occasional range limitations in tracking certain vessels, especially smaller (Class B AIS) vessels in winter. However, it is not considered that the comprehensiveness of the AIS data compromises confidence in the assessment.

51. Since the vessel traffic data for the Marine Scheme consists of AIS only, the data has limitations associated with non-AIS targets. However, the MCA, NLB and Trinity House were content with the methodology for vessel traffic data collection for the Marine Scheme which includes consideration of additional data sources such as VMS data, the UK Coastal Atlas of Recreational Boating (RYA, 2019b) and consultation feedback. AIS and Radar data from the BBWF EIAR Shipping and Navigation chapter and Blyth Demonstrator Projects was also reviewed. With these additional datasets incorporated, the characterisation of vessel traffic movements for the Shipping and Navigation Study Area is considered to be suitably comprehensive and adequate for the assessment.

52. Military vessels are not required to broadcast on AIS and may therefore be under-represented. Consultation with the Ministry of Defence was undertaken to establish any potential data gaps, which were not considered to be a concern.

13.1.9.2 COVID-19 PANDEMIC

53. It is widely accepted that the COVID-19 pandemic had a substantial effect on shipping movements globally during 2020 and early 2021. For example, the number of vessel calls at EU ports reduced by 10% between 2019 and 2020 (European Maritime Safety Agency (EMSA), 2022) and the number of UK port arrivals (DfT, 2022) reduced by 14% between 2019 and 2020, although this may also have been influenced by Brexit.

54. Therefore, any datasets containing these periods, including additional fishing data sources, port arrivals statistics and the winter 2021 survey data from the BBWF EIAR Shipping and Navigation chapter, may be influenced by the pandemic, e.g., show a lower number of vessels during these

periods. The main AIS data set, and primary source of data for the baseline assessment, spanning November 2021 to January 2022 and May to July 2022, is not expected to be impacted by the COVID-19 pandemic.

13.1.9.3 HISTORICAL INCIDENT DATA

55. Although all UK commercial vessels are required to report incidents to the MAIB, this is not mandatory for non-UK vessels unless they are in a UK port, within territorial waters or carrying passengers to a UK port. There are also no requirements for non-commercial recreational craft to report incidents to the MAIB. Nevertheless, the MAIB incident database is considered to be a suitable source for the characterisation of historical incidents and adequate for the assessment.

56. The RNLI incident data cannot be considered comprehensive of all incidents in the Shipping and Navigation Study Area. Although hoax and false alarms are excluded, any incident to which RNLI resource was not mobilised has not been accounted for in this dataset. Nevertheless, the RNLI incident data is considered to be a suitable source for the characterisation of historical incidents and adequate for the assessment.

13.1.9.4 ADMIRALTY CHARTS

57. The Admiralty Charts published by the UKHO are updated periodically, and therefore the information shown may not reflect the real-time features within the region with total accuracy. Taking into account consultation undertaken, the characterisation of navigational features is considered to be suitably comprehensive and adequate for the assessment. For aids to navigation, only those charted and considered key to establishing the shipping and navigation baseline are shown.

13.8. Scope of the Assessment

13.1.10 Impacts Scoped into the Assessment

58. The following impact pathways have been scoped into the assessment, as agreed through the Scoping process and follow up consultation with stakeholders and consultees[6]:

- Increased vessel to vessel collision risk between a third-party vessel and a project vessel (C, O&M, D);
- Vessel displacement leading to increased vessel to vessel collision risk between third-party vessels (C, O&M, D);
- Reduced access to local ports (C, O&M, D);
- Anchor interaction with exposed subsea cable between cable laying and protection campaigns (C);
- Fishing gear interaction with exposed subsea cable between laying and protection campaigns (C);
- Anchor interaction with subsea cable (O&M);
- Fishing gear interaction with subsea cable (O&M);
- Vessel grounding due to reduced under keel clearance (O&M); and

[6] C = Construction, O&M = Operation and maintenance, D = Decommissioning

- Interference with magnetic compasses (O&M).

13.1.11 Impacts Scoped Out of the Assessment

59. Impacts scoped out of the assessment were agreed with key stakeholders through consultation following receipt of the Scoping Opinion from MD-LOT and MMO in February and March 2023 respectively. These are summarised below for completeness:

- Vessel displacement due to project infrastructure (C, O&M, D);
  - As the Marine Scheme relates to the construction of subsea export cables, vessel traffic will not be displaced as a result of project infrastructure.

- Increased risk of vessel to structure allision (C, O&M, D); and
  - As the Marine Scheme relates to the construction of subsea export cables, there is no potential for allision between vessels and any aspects of the Marine Scheme

- Vessel displacement due to cable maintenance leading to increased vessel to vessel collision risk between third-party vessels (O&M)
  - Cable maintenance expected to be localised and short term with no significant vessel displacement impact.

13.9. Key Parameters for Assessment

13.1.12 Maximum Design Scenario

60. The maximum design scenario(s) (MDS) summarised here have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the details provided in Volume 2, Chapter 5: Project Description of this ES. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Project Description (e.g. different infrastructure layout), to that assessed here, be taken forward in the final design scheme.

61. Given that the MDS is based on the design option (or combination of options) that represents the greatest potential for change, confidence can be held that development of any alternative options within the design parameters will give rise to no worse effects than assessed in this impact assessment.

62. Site preparation works, in advance of construction, are predicted to commence in Q4 of 2026 and will continue until all installation activities have ceased. Landfall construction is expected to occur between Q4 of 2027 until Q4 of 2028. Export cable installation is expected to begin in Q3 2028 and is expected to last until Q4 of 2029. All activities associated with the Marine Scheme are predicted to conclude by the end of 2029. Until detailed design of the Marine Scheme is progressed and further refined pre-construction, this programme for the Marine Scheme as a whole is indicative and is subject to further refinement, but is used to inform assessment of construction phase impacts for the Marine Scheme.

63. Maximum design scenario specific to shipping and navigation impact assessment is presented in Table 13.8.

Table 13.8 Maximum design scenario specific to shipping and navigation impact assessment

Potential Impact	Maximum Design Scenario (Marine Scheme whole)	Maximum Design Scenario – Scottish water and English waters	Justification
Construction			
Increased vessel to vessel collision risk between a third-party vessel and a project vessel	• Construction of the Offshore Export Cable Corridor is expected to take up to 18 months with an overall programme of up to 39 months, including site preparation • Up to two pre-construction boulder removal / clearance vessels on site at any one time • Up to two cable construction vessels on site at any one time • Up to 10 guard vessels on site at any one time • Up to two survey / Offshore Construction Vessel (OCV) vessels on site at any one time • Up to two cable protection construction vessels on site at any one time	**English waters** • In addition to MDS presented for whole Marine Scheme, a jack up vessel may be used to support Landfall works **Scottish waters** • As presented for whole Marine Scheme	Greatest number of vessels associated with the Marine Scheme and greatest duration resulting in the maximum temporal effect on vessel to vessel collision risk involving a third-party vessel and a project vessel.
Vessel displacement leading to increased vessel to vessel collision risk between third-party vessels	• Construction of the Offshore Export Cable Corridor is expected to take up to 18 months with an overall programme of up to 39 months, including site preparation • Up to two pre-construction boulder removal / clearance vessels on site at any one time • Up to two cable construction vessels on site at any one time • Up to 10 guard vessels on site at any one time • Up to two survey / OCV vessels on site at any one time • Up to two cable protection construction vessels on site at any one time • 500 m advisory safe passing distances around cable construction vessels	**English waters** • In addition to MDS presented for whole Marine Scheme, a jack up vessel may be used to support Landfall works **Scottish waters** • As presented for whole Marine Scheme	Greatest number of vessel movements and activities associated with the Marine Scheme and greatest duration resulting in the maximum temporal effect on vessel to vessel collision risk between third-party vessels

Potential Impact	Maximum Design Scenario (Marine Scheme whole)	Maximum Design Scenario – Scottish water and English waters	Justification
Reduced access to local ports	• Construction of the Offshore Export Cable Corridor is expected to take up to 18 months with an overall programme of up to 39 months, including site preparation • Up to two pre-construction boulder removal / clearance vessels on site at any one time • Up to two cable construction vessels on site at any one time • Up to 10 guard vessels on site at any one time • Up to two survey / OCV vessels on site at any one time • Up to two cable protection construction vessels on site at any one time • 500 m advisory safe passing distances around cable construction vessels	**English waters** • In addition to MDS presented for whole Marine Scheme, Jack-up vessel may be used to support Landfall works **Scottish waters** • As presented for whole Marine Scheme	Greatest number of vessel movements and activities associated with the Marine Scheme and greatest duration resulting in the maximum temporal effect on reduced access to local ports
Anchor interaction with exposed subsea cable between cable laying and protection campaigns	• Maximum of four Offshore Export Cables • Cable corridor length up to 180 km • Potential for surface lay and post-lay burial construction method	**Scottish waters** • Maximum of four Offshore Export Cables • Cable corridor length up to 40 km in Scottish waters • Potential for surface lay and post-lay burial construction method **English waters** • Maximum of four Offshore Export Cables • Cable corridor length up to 140 km in English waters • Potential for surface lay and post-lay burial construction method	Greatest length of Offshore Export Cable, Offshore Export Cable construction method could leave surface-laid Offshore Export Cable for certain length of time
Fishing gear interaction with exposed subsea cable between laying and protection campaigns	• Maximum of four Offshore Export Cables • Cable corridor length up to 180 km • Potential for surface lay and post-lay burial construction method	**Scottish waters** • Maximum of four Offshore Export Cables • Cable corridor length up to 40 km in Scottish waters • Potential for surface lay and post-lay burial construction method	Greatest length of Offshore Export Cable, Offshore Export Cable construction method could leave surface-laid Offshore Export Cable for certain length of time

Potential Impact	Maximum Design Scenario (Marine Scheme whole)	Maximum Design Scenario – Scottish water and English waters	Justification
		English waters • Maximum of four cables • Cable corridor length up to 140 km in English waters Potential for surface lay and post-lay burial construction method.	
Operation and Maintenance			
Increased vessel to vessel collision risk between a third-party vessel and a project vessel	• Operation and maintenance phase of up to 35 years • Annual routine inspection survey • Annual geophysical survey • Up to four repair events and four reburial events of up to 1,000 m each over lifetime	Applies to the whole Marine Scheme	Greatest number of activities associated with the Marine Scheme resulting in the maximum temporal effect on vessel to vessel collision risk involving a third-party vessel and a project vessel.
Anchor interaction with subsea cable	• Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 180 km • Target burial between 0.5 m and 3 m, informed by CBRA[7] • External cable protection required for up to 37 km per cable (up to 21%) • Up to five cable crossings requiring external cable protection totalling 1km in length per cable	**Scottish waters** • Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 40 km in Scottish waters • Target burial between 0.5 m and 3 m, informed by CBRA • External cable protection required for up to 6 km per cable in Scottish waters • No crossings in Scottish waters	Largest possible extent of Offshore Export Cable and greatest duration resulting in the maximum spatial and temporal effect. Minimum burial depth resulting in maximum potential interaction with anchors.

[7] For areas where burial can be achieved. Where burial cannot be achieved (due to ground conditions) surface lay and protection techniques will be employed, therefore minimum burial may be 0m but with additional protection.

Potential Impact	Maximum Design Scenario (Marine Scheme whole)	Maximum Design Scenario – Scottish water and English waters	Justification
		English waters • Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 140 km in English waters • Target burial between 0.5 m and 3 m • External cable protection required for up to 31 km per cable in English waters • Up to five cable crossings in English waters requiring external cable protection	
Fishing gear interaction with subsea cable	• Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 180 km • Target burial between 0.5 m and 3 m, informed by CBRA[7] • External cable protection required for up to 37 km per cable (up to 21%) • Up to five cable crossings requiring external cable protection totalling 1km in length per cable	**Scottish waters** • Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 40 km in Scottish waters • Target burial between 0.5 m and 3 m, informed by CBRA • External cable protection required for up to 6 km per cable in Scottish waters • No crossings in Scottish waters **English waters** • Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 140 km in English waters • Target burial between 0.5 m and 3 m, informed by CBRA • External cable protection required for up to 31 km per cable in English waters • Up to five cable crossings in English waters requiring external cable protection	Largest possible extent of Offshore Export Cable and greatest duration resulting in the maximum spatial and temporal effect. Minimum burial depth resulting in maximum interaction with fishing gear.

Potential Impact	Maximum Design Scenario (Marine Scheme whole)	Maximum Design Scenario – Scottish water and English waters	Justification
Vessel grounding due to reduced under keel clearance	• Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 180 km • External cable protection required for up to 37 km per cable (up to 21%) • Up to five cable crossings requiring external cable protection • Maximum height of cable protection 1.5 m	**Scottish waters** • Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 40 km in Scottish waters • External cable protection required for up to 6 km per cable in Scottish waters • No crossings in Scottish waters • Maximum height of cable protection 1.5 m **English waters** • Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 140 km in English waters • External cable protection required for up to 31 km per cable in English waters • Up to five cable crossings in English waters requiring external cable protection • Maximum height of cable protection 1.5 m	Largest possible extent of external cable protection and greatest duration resulting in the maximum spatial and temporal effect on under keel clearance.
Interference with magnetic compasses	• Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 180 km	**Scottish waters** • Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 40 km in Scottish waters • Target burial between 0.5 m and 3 m, informed by CBRA • External protection where burial cannot be achieved	Largest possible extent of Offshore Export Cable and greatest duration resulting in the maximum spatial and temporal effect on magnetic position fixing equipment.

Potential Impact	Maximum Design Scenario (Marine Scheme whole)	Maximum Design Scenario – Scottish water and English waters	Justification
	• Target burial between 0.5 m and 3 m, informed by CBRA[8] • External protection where burial cannot be achieved	**English waters** • Operation and maintenance phase of up to 35 years • Maximum of four Offshore Export Cables • Cable corridor length up to 140 km in English waters • Target burial between 0.5 m and 3 m, informed by CBRA • External protection where burial cannot be achieved	
Decommissioning			
Increased vessel to vessel collision risk between a third-party vessel and a project vessel Vessel displacement leading to Increased vessel to vessel collision risk between third-party vessels Reduced access to local ports	At the end of the operational lifetime of the Marine Scheme, the operator of the Marine Scheme will develop and agree a solution for the onward handling of the Offshore Export Cables with the regulator. This decision will be based on the advice from the marine regulators and informed by the prevailing environmental regulatory requirements at that time, and relevant best-practice. An assessment has been undertaken on a maximum design scenario of removing all Offshore Export Cables. The decommissioning sequence will generally be the reverse of the construction sequence and involve similar types and numbers of vessels and equipment.	Applies to the whole Marine Scheme	Removal of all cables presents the MDS for these impacts in terms of greatest number of vessels / temporal effect on vessel to vessel collision risk.

[8] For areas where burial can be achieved (due to ground conditions) surface lay and protection techniques will be employed, therefore minimum burial may be 0m but with additional protection.

3.10. Methodology for Assessment of Effects

13.1.13 Overview

64. The shipping and navigation assessment of effects has followed the FSA methodology since this is the internationally recognised approach for assessing the impact to shipping and navigation receptors, and is the approach required under the MCA's methodology (Annex 1 of MGN 654). The following guidance documents have been considered:

- 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);
- MGN 661 (Merchant and Fishing) Navigation – Safe and Responsible Anchoring and Fishing Practices (MCA, 2021b);
- MGN 372 (Merchant and Fishing) OREI Guidance to Mariners Operating in the Vicinity of UK OREIs (MCA, 2008); and
- The RYA Position on Offshore Renewable Energy Developments: Paper 1 (of 4) – Wind Energy (RYA), 2019a).

65. The assessment methodology for shipping and navigation differs from the standard EIA Methodology outlined in Volume 2, Chapter 3: EIA Methodology.

13.1.14 Impact Assessment Criteria

66. Determining the significance of effects is a two-stage process that involves defining the severity of consequence and frequency of occurrence. This section should describe the criteria applied in this chapter to assign values to each of these two factors.

67. The criteria for defining severity of consequence in this chapter are outlined in Table 13.9 below. For the level of assistance required to manage environmental damage, the tiers indicated relate to the incident response matrix provided in the National Contingency Plan (MCA, 2014).

Table 13.9 Definition of terms relating to the severity of consequence

Severity of Consequence	Definition
Negligible	No perceptible risk to people, property, the environment or business.
Minor	Slight injury(s) to people
	Minor damage to property, i.e. superficial damage
	Tier 1[9] environmental damage with local assistance required
	Minor reputational risk to business limited to users
Moderate	Multiple minor or single serious injury to people
	Damage to property not critical to operations
	Tier 2[10] environmental damage with limited external assistance required
	Local reputational risk to business.
Serious	Multiple serious injuries or single fatality to people
	Damage to property resulting in critical risk to operations
	Tier 2[10] environmental damage with regional assistance required
	National reputational risk to business
Major	Multiple fatalities to people
	Total loss of property
	Tier 3[11] environmental damage with national assistance require
	International reputational risk to business

68. The criteria for defining frequency of occurrence in this chapter are outlined in Table 13.10 below.

Table 13.10 Definition of terms relating to the frequency of occurrence

Value (Sensitivity of the Receptor)	Description
Frequent	Yearly
Reasonably Probable	One per one to 10 years
Remote	One per 10 to 100 years
Extremely Unlikely	One per 100 to 10,000 years
Negligible	Less than one occurrence per 10,000 years

69. The significance of the effect upon shipping and navigation is determined by correlating the severity of consequence and frequency of occurrence, as outlined in Table 13.11 below.

70. For the purposes of this assessment:

[9] Tier 1 – Local (within the capability of one local authority, offshore installation operator or harbour authority

[10] Tier 2 – Regional (beyond the capability of one local authority or requires additional contracted response from offshore operator or from ports or harbours

[11] Tier 3 – National (requires national resources coordinated by the MCA for a shipping incident and the operator for an offshore installation incident)

- A level of effect of Unacceptable will be considered a 'significant' effect in terms of the EIA Regulations; and
- A level of effect of Broadly Acceptable or Tolerable (if ALARP) will be considered 'not significant' in terms of the EIA Regulations.

71. Effects of Unacceptable significance are therefore considered important in the decision-making process, whilst effects of Broadly Acceptable or Tolerable significance warrant little, if any, weight in the decision-making process.

Table 13.11 Matrix used for the assessment of the significance of the effect

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

72. In line with the request from MD-LOT through Scoping, the Assessment of Impacts identifies where impacts are relevant to Scottish waters, English waters or both. Where there is no separation of assessment of impacts, the assessment for the Marine Scheme (as a whole entity) is relevant to both Scottish and English waters. Additionally, differences in terminology between this chapter (which uses EIA terminology) and the NRA (which uses FSA terminology) are summarised in Table 13.12.

Table 13.12 Summary of Differences in Terminology Between EIA and NRA

EIA Term	NRA Term	Definition
Action	Cause	An event or activity that may create an impact.
Impact	Hazard	A potential to threaten human life, health, property or the environment.
Designed in measure	Embedded mitigation measure	A means of controlling a single element of impact which is embedded (standard or good practice measures utilised or in place).

EIA Term	NRA Term	Definition
Secondary	Additional mitigation measures	A means of controlling a single element of an impact which is additional to the risk with the designed in measures (or embedded mitigation) in place (required to reduce impact to not significant or As Low As Reasonably Practicable (ALARP)).
Effect	Risk	The combination of the frequency of occurrence and the severity of consequence of an impact which results in a statement of significance.
Receptor	User	An impact sufferer(s).

3.11. Measures Adopted as Part of the Marine Scheme

73. As part of the project design process, a number of measures have been proposed to reduce the potential for impacts on shipping and navigation (see Table 13.13). These include measures which have been incorporated as part of the Marine Scheme's design (referred to as 'designed in measures') and measures which will be implemented regardless of the impact assessment (referred to as 'tertiary mitigation'). As there is a commitment to implementing these measures, they are considered inherently part of the design of the Marine Scheme and have therefore been considered in the assessment presented in section 13.12 below (i.e. the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type of development.

74. It is noted that all mitigation measures outlined below are applicable to the Marine Scheme in both Scottish and English waters.

Table 13.13 Measures adopted as part of the Marine Scheme (designed in measures & tertiary mitigation)

Embedded Mitigation Measure	Justification	Applicable Jurisdiction
Promulgation of information (such as, position and nature of works, vessel routes, Safety Zones, advisory safe passing distances, navigational warnings) as required via Kingfisher Bulletins.	The construction of infrastructure and implementation of safety distances around construction vessels may displace recreation vessels. Likewise, maintenance and decommissioning activities may also displace recreation vessels. Circulation of information via Notices to Mariners (NtM), Kingfisher, Radio Navigational Warnings, Navigational Telex (NAVTEX), and/or broadcast warnings as soon as reasonably practicable in advance of and during the offshore works to inform the commercial fishing industry of vessels routes, timing and locations of construction works, and relevant details the construction activities. These will be augmented with NAVTEX and Radio Navigation Warning broadcasts as appropriate. Maximises awareness of the Marine Scheme allowing vessels to passage plan in advance, in the interests of safety to infrastructure and other users receptors.	Scottish and English waters
Vessel marks and lighting, and AIS.	In order to maximises awareness of temporary hazards, Cable Lay Vessels (CLVs) and other vessels involved in cable construction will display appropriate marks and lights, and broadcast their status on AIS at all times, to indicate the nature of the work in progress, and highlight their restricted manoeuvrability.	Scottish and English waters
Temporary aids to navigation may be deployed (if required) to guide vessels around any areas of construction activity	Temporary aids to navigation maximises awareness of temporary hazards	Scottish and English waters
Guard vessels and clearance distances	Project vessels will implement a 500 m advisory safe passing distances with third party vessels during periods of construction or major repair or maintenance. During operation, where cable exposures exist that would result in significant risk, guard vessels will be used where appropriate until the risk has been mitigated by burial and/or other protection methods. Guard vessels will use Automatic RADAR Plotting Aid (ARPA) to monitor vessel activity and predict possible interactions whilst alongside the construction vessel(s). This facilitates engagement with fisheries stakeholders during specific project works, reduces potential for interactions between the Marine Scheme and fishing activities, as well as maximising awareness of temporary hazards	Scottish and English waters
Marine coordination and communication to manage project vessel movements.	Ensures project vessels are suitably managed to reduce the likelihood of involvement in incidents and maximise the ability to assist in the event of a third-party incident.	Scottish and English waters

Embedded Mitigation Measure	Justification	Applicable Jurisdiction
Compliance of all project vessels with international marine regulations as adopted by the Flag State, notably the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs) (IMO, 1972/77) and Safety of Life at Sea (SOLAS) (IMO, 1974)	Reduces the risk introduced due to the presence of project vessels.	Scottish and English waters
Liaison with local ports and harbours, particularly the Port of Blyth, during the construction phase.	Liaison with local ports and harbours during the construction phase maximises awareness of the Marine Scheme allowing vessels to passage plan in advance	Scottish and English waters
Appointment of a Company Fisheries Liaison Officer (CFLO)	A CFLO is already in place and will continue to act as a specific point of contact to engage with and liaise with the fishing industry. A CFLO will be in place throughout the lifespan of the Marine Scheme.	Scottish and English waters
Use of Offshore Fisheries Liaison Officers (OFLOs) where required and appropriate	The use of OFLOs facilitates engagement with fisheries stakeholders during specific Project works and minimises potential for conflict between the Marine Scheme and fishing activities.	Scottish and English waters
Development of a Fisheries Management and Mitigation Strategy (FMMS) / Fisheries Liaison and Co-existence Plan (FLCP) for Marine Directorate Licencing and Operations Team (MD-LOT) and Marine Management Organisation (MMO) approval, and in consultation with fisheries stakeholders.	The FMMS/ FLCP details the Applicant's proposed approach to fisheries liaison and to facilitating co-existence, including details on the measures which are proposed to be implemented to reduce impacts on commercial fishing as far as practicable. An outline FMMS / FLCP has been provided as part of this application (Volume 5, Appendix 12.2) and will be updated for submission to MMO and MD-LOT prior to construction.	Scottish and English waters
As-Built Information	The location, extent and nature of the cable protection measures used will be communicated to the relevant stakeholders including the UK Hydrographic Office (UKHO), relevant fishing industry representatives and Kingfisher Information Service. Provides information so all other legitimate users of the sea are aware of the location, extent and nature of cable protection..	Scottish and English waters

Embedded Mitigation Measure	Justification	Applicable Jurisdiction
Cable plan (CaP)	Suitable implementation and monitoring of cable protection through the Marine Scheme and adherence to a CaP. This will be produced and consulted on (in line with consent conditions) prior to installation and will include a detailed cable laying plan including geotechnical data, cable laying techniques and informed by a Cable Burial Risk Assessment (CBRA) which will include details on minimum target burial depths.	Scottish and English waters
Cable burial depth	Cables will be buried to a minimum target depth of 0.5 m and only protected using external protection (e.g., rock berms) where minimum target burial depth is not achieved or at third-party crossings. Application of target cable burial depth will reduce the potential for cable exposure from interactions between metocean regimes (e.g. wave, sand, and currents) and will reduce interaction with fishing gear. Cable burial also reduces risk of interference with magnetic position fixing equipment.	Scottish and English waters
Cable protection	The use of cable protection will be minimised as far as practicable, and only used where required. Additional external cable protection (e.g. rock placement) will only be used where the minimum target burial depth cannot be achieved, for example in areas of hard ground or at third-party crossings. This will be informed by outputs from the Cable Burial Risk Assessment completed by the installation contractor(s) prior to the commencement of installation. Rock utilised in berms will be clean with low fines. Use of graded rock and 1:3 profile berms at areas of rock protection will reduce potential fishing gear snagging risk.	Scottish and English waters
Monitoring of cable burial and protection	Infrastructure will be monitored through post lay and burial inspection surveys to identify exposures and any requirements for repair and reburial, with remedial action taken as appropriate and as soon as practicable. Findings will be shared with the fishing industry in order to facilitate co-existence, prevent potential damage to and from fishing gear, and minimise potential safety risks.	Scottish and English waters
Location specific review of impacts to shipping and consultation with the MCA for instances of >5% reduction in water depth.	Following further survey and detailed engineering, if areas are identified where external protection is required and the Maritime and Coastguard Agency (MCA) condition of no more than 5% reduction in water depth is not achievable, a location specific review of impacts to shipping and consultation with the MCA will be carried out and additional mitigations agreed as required in order to minimise the risk of vessel collision due to reduced under keel clearance.	Scottish and English waters
Compass deviation effects.	Compass deviation effects will be minimised through cable design and separation distance, informed by compass deviation studies (post consent) to comply with MCA requirements. If the requirements cannot be confirmed pre-construction, a post construction deviation survey of the cable route will be undertaken, data provided to the MCA and UKHO, and a precautionary notation may be required on the appropriate Admiralty Charts regarding possible magnetic anomalies along the cable route.	Scottish and English waters

3.12. Assessment of Impacts

75. The potential impacts arising from the construction, operation and maintenance and decommissioning phases of the Marine Scheme are listed in section 13.8 while the maximum design scenario against which each impact has been assessed is presented in section 13.9.

76. An assessment of the likely significance of the effects of the Marine Scheme on shipping and navigation receptors caused by each identified impact is given below.

13.1.15 Potential Effects During Construction

13.1.15.1 INCREASED VESSEL TO VESSEL COLLISION RISK BETWEEN A THIRD-PARTY VESSEL AND A PROJECT VESSEL

77. There is an increased collision risk created during the construction phase for all passing traffic due to the presence of vessels associated with the construction of the Offshore Export Cables, including vessels involved in surveys, seabed levelling, cable construction, cable burial and Landfall works. The nature of cable construction, and other activities, requires large, slow moving vessels which will be Restricted in their Ability to Manoeuvre (RAM). Therefore, these vessels may have limited capability in taking avoidance action from a passing vessel on a collision course, should such a situation arise. In addition, there may be an increased collision risk between third-party vessels and jack ups used during Landfall works in English waters. Due to their reduced size and increased mobility in comparison, smaller vessels associated with the construction phase, e.g. tugs, guard vessels, support vessels, are considered to pose a lesser risk of collision than that of the larger cable construction vessels.

78. The collision risk is likely to be greater in higher density shipping areas. Passing vessel activity was significant across the whole Marine Scheme, with higher density approximately 3 nm from the Landfall in English waters, associated with cargo vessels and tankers transiting north/south past Blyth, heading to and from ports such as Aberdeen, Grangemouth, Immingham, Rotterdam and Antwerp. Fishing vessels were most active within 3 nm of the coast in English waters, with some activity also recorded within the BBWF array area section of the Marine Scheme in Scottish waters. It is likely there are other non-AIS vessels operating nearshore in English waters.

79. Up to two cable construction vessels which are RAM will be on site at any one time and a jack up vessel is expected to be used for Landfall works. In addition there may be up to two pre-construction boulder removal / clearing vessels, 10 guard vessels, two survey/OCV vessels and two cable protection vessels on site at any one time. Site preparation works are expected to take place between Q4 2026 and Q4 2029, with the overall timescale for Landfall works to be 15 months between Q4 2027 and Q4 2028 and for export cable construction expected to be 18 months between Q3 2028 and Q4 2029.

80. Project vessels will be managed by marine coordination, will display suitable marks and lights, will broadcast on AIS (where appropriate) and will be compliant with relevant Flag State regulations including the COLREGs and SOLAS.

81. Details of construction activities, including any advisory safe passing distances, as defined by risk assessment, will be suitably promulgated via NtM, Kingfisher, Radio Navigational Warnings, NAVTEX and/or broadcast warnings to maximise awareness of ongoing construction activities. Communication with the Port of Blyth about the construction work activities and appointment of an

FLO will also help to raise awareness of the works and minimise collision risk. Guard vessels will be used to raise awareness of construction work to passing vessels and temporary aids to navigation may be deployed (if required) to guide vessels around any areas of construction activities.

13.1.15.1.1 Severity of consequence

82. The most likely consequences in the event of a collision incident between a Project vessel and third-party vessel are minor contact between the vessels resulting in minor damage to property and minor reputational effects on business but no perceptible effect on people. The maximum adverse scenario could involve one of the vessels foundering resulting in Potential Loss of Life (PLL) and the environmental consequence of pollution. Such a scenario would be more likely if the third-party vessel involved was a small craft which may have weaker structural integrity than a commercial vessel.

83. The severity of consequence is therefore considered to be moderate.

13.1.15.1.2 Frequency of occurrence

84. The impact will be present throughout the construction phase which will last for up to 18 months (39 months including site preparation works). With the mitigation measures noted above implemented, it is considered unlikely that a close encounter between a third-party vessel and a Project vessel will occur. In the event that such an encounter does occur, collision avoidance action would be implemented by the vessels as per the COLREGs, including Rule 18 which governs responsibilities between vessels if one is RAM, thus ensuring that the likelihood of the encounter developing into a collision incident is very low.

85. The frequency of occurrence is therefore considered to be extremely unlikely for the Marine Scheme as a whole.

13.1.15.1.3 Significance of the effect

86. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.15.1.4 Secondary mitigation and residual effect

87. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.15.2 VESSEL DISPLACEMENT LEADING TO INCREASED VESSEL TO VESSEL COLLISION RISK BETWEEN THIRD-PARTY VESSELS

88. Construction of the Offshore Export Cables may cause displacement of vessels around the areas of construction, which could lead to an increased risk of a collision between two third-party vessels during the construction phase. In particular vessels may be required to deviate around cable construction vessels, which are large, slow moving vessels which will be RAM. In addition, jack up vessels used for Landfall works may also lead to vessel displacement close to the shore in English waters.

89. This will most likely affect busier areas of shipping. From the baseline assessment, passing vessel activity was evident across the whole Marine Scheme, with higher vessel numbers closer to the Landfall, within approximately 3 nm of the coast, in English waters. Cargo vessels and tankers transiting north/south past Blyth, heading to and from ports such as Aberdeen, Grangemouth, Immingham, Rotterdam and Antwerp were notable in this area.

90. Regular fishing and recreational activity was observed throughout the Marine Scheme. This was mainly concentrated closer to shore (within approximately 3 nm of the Landfall within English waters), however some fishing activity was also observed in the part of the Marine Scheme which overlaps BBWF array area in Scottish waters. Construction vessels, and vessels associated with Landfall works, may therefore cause a disruption to both local fishermen and recreational boaters. It is noted that recreational craft and small fishing vessels close to shore will be under-represented by the AIS data.

91. Site preparation works are expected to take place throughout the 39 month construction period with between Q4 2026 and Q4 2029, with the overall timescale for Landfall works expected to be 15 months and for export cable construction 18 months between Q3 2028 and Q4 2029. However, the spatial extent of construction areas where vessels may be required to deviate around vessels which are RAM is expected to be small at any given time. Additionally, outside of the nearshore area, there is adequate available sea room for vessels to safely alter their passage.

92. Details of construction activities, including any advisory safe passing distances, as defined by risk assessment, will be suitably promulgated via NtMs, Kingfisher, Radio Navigational Warnings, NAVTEX and/or broadcast warnings to maximise awareness of ongoing construction activities. Guard vessels will be used to raise awareness of construction works to passing vessels and communication with the Port of Blyth will help to minimise collision risk associated with vessels using the port.

93. The appointment of an FLO will aid in ensuring local fishermen are made aware of construction works. Local Notices to Mariners as well as notifying local marinas and sailing clubs of the works will help to inform recreational users. All vessels will be expected to comply with international marine legislation, including the COLREGs and SOLAS.

13.1.15.2.1 Severity of consequence

94. In the event of a collision incident between third-party vessels, the most likely consequences are minor contact between the vessels resulting in minor damage to property and minor reputational effects on business but no perceptible effect on people. The maximum adverse scenario could involve one of the vessels foundering resulting in Potential Loss of Life (PLL) and the environmental consequence of pollution. Such a scenario would be more likely if one of the vessels involved was a small craft which may have weaker structural integrity than a commercial vessel.

95. The severity of consequence is therefore considered to be moderate.

13.1.15.2.2 Frequency of occurrence

96. The impact will be present throughout the construction phase which will last for up to 18 months (39 months including site preparation works). Given that third-party vessels are expected to be compliant with relevant Flag State regulations including the COLREGs, collision avoidance action ensure that the likelihood of an encounter developing into a collision incident is low. This is furthered by the promulgation of information which will maximise awareness of ongoing construction activities, thus allowing third-party vessels to passage plan in advance, if considered appropriate.

97. The frequency of occurrence is therefore considered to be extremely unlikely for the Marine Scheme as a whole.

13.1.15.2.3 Significance of the effect

98. Overall, the severity of consequence is deemed to be moderate, and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.15.2.4 Secondary mitigation and residual effect

99. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.15.3 REDUCED ACCESS TO LOCAL PORTS

100. There is the potential for reduced access to local ports due to surveys, seabed preparation and construction of the Offshore Export Cables associated with the Marine Scheme. The closest port or harbour to the Marine Scheme is the Port of Blyth, located 1.4 nm south of the Landfall in English waters. Therefore, construction works in English waters may cause reduced access to the Port.

101. Any requirement to wait on tidal windows to access the Port of Blyth would increase the impact of reduced access due to construction works, however the majority of vessels entering the Port do not have to wait on tidal windows as the channel is dredged, and can therefore enter the port at any time, Vessels exceeding 6.5 m to 7.0 m may have to wait. There may also be some disruption to dredgers accessing the port, or spoil grounds if dredging campaigns were to overlap temporally with the construction period, however these tend to be short term.

102. In addition, any survey or repair works required on the North Sea Link (NSL) interconnector, NO-UK or Havhingsten telecommunication cables near the Landfall areas could lead to increased disruption to Port of Blyth access in English waters.

103. The Marine Scheme is located 33 nm to the east of the entrance to the Firth of Forth in Scottish waters. Vessels visiting Forth Ports (e.g. Leith, Rosyth, Grangemouth) contribute a significant proportion of shipping crossing the Marine Scheme in Scottish waters. There may therefore be a disruption to vessels on route towards the Forth Ports, however it is considered that there is sufficient sea room available for vessels to plan their passages accordingly.

104. Cable installation, including site preparation works are expected to take place over a period of 39 months between Q4 2026 and Q4 2029. Project vessels will be managed by marine coordination, will display appropriate marks and lights, broadcast on AIS (where available) and will be compliant with relevant Flag State regulations including the COLREGs, including rule 18 which applies to vessels which are RAM. Liaison with local ports and FLO will help to manage disruption.

13.1.15.3.1 Severity of consequence

105. Surveys, seabed preparation and construction of the Offshore Export Cables may result in some disruption to vessels crossing the Marine Scheme in and out of the Port of Blyth in English waters and to vessels crossing the Marine Scheme in the outer Firth of Forth, on route to Forth Ports, in Scottish waters, due to the presence of vessels which may be RAM, such as a cable laying vessel. However, the Offshore Export Cables are expected to be installed in phases, which will restrict any disruption to only a small portion of the Marine Scheme as a whole.

106. Given the distance between the Landfall area and the Port of Blyth, and the close proximity of Landfall works to the coastline, reduced access during Landfall works (e.g. due to a jack up vessel) is not anticipated. No effect is anticipated on port related services such as pilotage.

107. The severity of consequence is therefore considered to be minor.

13.1.15.3.2 Frequency of occurrence

108. The impact will be present throughout the construction phase which will last for up to 18 months (39 months including site preparation works). An average of nine vessels per day accessed the Port of Blyth based on the AIS data, the majority of which were fishing vessels (31%), recreational craft (14%) and offshore support vessels (11%) visiting oil and gas fields, and offshore wind farms. It is noted that there will be additional small craft not broadcasting on AIS also requiring access to the Port of Blyth.

109. However, due to the distance between the Port of Blyth and the Marine Scheme, and the localised and temporary nature of cable construction works, the disruption to port access is reduced. This impact will be mitigated by good communication using approaches set out in Table 13.13 with the Port of Blyth during the construction phase.

110. For the Marine Scheme in English waters, the frequency of occurrence is therefore considered to be remote.

111. In Scottish waters, the Marine Scheme lies 33 nm to the east of the entrance to the Firth of Forth and therefore the frequency of occurrence is considered to be extremely unlikely.

13.1.15.3.3 Significance of the effect

112. The severity of consequence is deemed to be minor and the frequency of occurrence for the Marine Scheme in Scottish waters is considered to be extremely unlikely. The effect in Scottish waters will, therefore, be of **broadly acceptable adverse** significance, which is not significant in EIA terms.

113. The severity of consequence is deemed to be minor and the frequency of occurrence for the Marine Scheme in English waters is considered to be remote. The effect in English waters will, therefore, be of **broadly acceptable adverse** significance, which is not significant in EIA terms.

13.1.15.3.4 Secondary mitigation and residual effect

114. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.15.4 ANCHOR INTERACTION WITH EXPOSED SUBSEA CABLE BETWEEN CABLE LAYING AND PROTECTION CAMPAIGNS

115. The preferred approach for cable burial has not yet been confirmed and there is a possibility the cable burial will be a post-lay operation. Therefore, there may be a period of time (estimated to be up to two months) after laying when the Offshore Export Cables are exposed and not protected through burial or other means such as rock placement. This period represents a potentially higher risk of interaction from vessel anchors with the surface-laid cables. In addition, there may be temporarily exposed cables on the seabed between construction campaigns before cable jointing has been completed.

116. There is a risk that a nearby anchored vessel could lose its holding ground and subsequently drag anchor over the cables. Vessels at anchor were mainly located around the charted anchorage associated with the Port of Blyth, approximately 2.5 nm south of the Marine Scheme in English waters.

117. If a passing vessel suffers engine failure, there is a possibility that it may drop anchor to avoid drifting into an emergency situation such as a collision, allision or grounding. This is more likely to occur in areas closer to the coast or to other hazards (e.g. offshore developments). In open waters where depths are deeper and anchoring may not be feasible, the vessel is more likely to attempt to either fix the problem or await assistance.

13.1.15.4.1 Severity of consequence

118. Any vessel anchor could interact with the exposed cables. If an anchor becomes snagged on the cables, there could be a risk of injury in trying to free it. If the anchor cannot be freed the safest action is to slip it, and not attempt to raise or cut the cable.

119. The most likely consequences are limited damage to property (anchoring vessel or subsea cable). The maximum adverse scenario may include damage to property including to the vessel's anchor or subsea cable.

120. The severity of consequence is therefore considered to be moderate.

13.1.15.4.2 Frequency of occurrence

121. From the vessel traffic survey data, the majority of anchoring activity took place close to shore approximately 2.5 nm to the south of the Marine Scheme in English waters. Given the predominant wind direction from the south-west, vessels are likely to drag towards the cable in an anchor dragging incident. The closest anchored vessel to the Marine Scheme in English waters was an oil and gas vessel recorded 0.5 nm to the south. Vessels were also noted to anchored within the Marine Scheme, in the BBWF array area, in Scottish waters.

122. Areas where emergency anchoring risk is expected to be higher are within 30 nm of the coast in English waters associated with cargo vessels and tankers transiting north/south past the Port of Blyth, further offshore associated with vessel routes to/from the Firth of Forth in Scottish waters, and fishing activity close to the Landfall in English waters. The maritime incident data showed that the most frequent incident type to be recorded was machinery failure, which could lead to emergency anchoring.

123. Mitigation includes circulation of information to make mariners aware of the exposed cable and use of guard vessels where cable exposures are considered to present significant risk to navigation.

124. The frequency of occurrence is considered to be extremely unlikely for the Marine Scheme as a whole.

13.1.15.4.3 Significance of the effect

125. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.15.4.4 Secondary mitigation and residual effect

126. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.15.5 FISHING GEAR INTERACTION WITH EXPOSED SUBSEA CABLE BETWEEN LAYING AND PROTECTION CAMPAIGNS

127. Similar to the impact associated with vessel anchors, there is the potential for risk of interaction from fishing gear with surface-laid cables if post-lay burial is used, as this may result in a period of time (estimated to be up to two months) during which the cables are exposed (prior to burial or placement of external protection), or between construction campaigns before cable jointing has been completed.

13.1.15.5.1 Severity of consequence

128. Although current maritime industry guidance is to avoid demersal trawling (and anchoring) in the immediate vicinity of cables (MGN 661, the Mariner's and all Admiralty charts), it is acknowledged that fishing may still occur over the Offshore Export Cables either inadvertently, or at the discretion of fishing vessel operators. As such the Offshore Export Cables will be protected to minimise the risk of damage through interactions with fishing equipment as far as is practicable. Fishing activity is considered further in Volume 2, Chapter 12: Commercial Fisheries.

129. There is higher risk of snagging from demersal gear if the cable is exposed. The response from the crew includes reducing / reversing the propulsive force, attempting to unfasten the equipment, or releasing the gear, and therefore in the majority of snagging incidents, it should be possible to recover the situation without any serious consequences (e.g. injury or fatality to crew members). However, accident data from the MAIB indicates that safe recovery from a snagging incident is not always the outcome. Consequences of snagging therefore range from damage to gear and the cable, loss of stability due to lines being put under strain and in the worst case, capsize of the vessel, men overboard and risk of injury or fatality. For example, a risk of capsize could occur if the vessel attempted to free its gear by raising the cable rather than releasing the gear.

130. The severity of consequence is therefore considered to be serious.

13.1.15.5.2 Frequency of occurrence

131. Fishing vessels carrying demersal gear that interacts with the seabed when deployed present the greatest risk of snagging on subsea cables. Static gear types (e.g. potters/whelkers and gill netters) are not considered to present a safety risk from snagging as they are able to carefully select the position of their gear, avoiding any subsea cables. Demersal gear types identified in the baseline assessment include demersal otter trawlers (single, twin and pair), dredgers, beam trawlers and seiners, which together contributed 66% of gear types recorded on AIS in the area. The highest risk area of snagging is where vessels engaged in fishing with demersal gears are most active. Based on the AIS data, the most demersal fishing activity occurs along the first 6 nm of the Marine Scheme from the Landfall in English waters, although demersal fishing activity is evident along the whole Marine Scheme, albeit at relatively low intensities. It is also noted that there is likely to be significant activity from small fishing vessels in coastal waters, which may be under-represented in the AIS data, although these are most likely to be using static gear which has lower snagging risk. Fishing activity is considered further in Volume 2, Chapter 12: Commercial Fisheries, in which it is noted there are a number of fishing vessels of such a length that they are not covered by AIS or VMS data, and therefore consultation has been undertaken to establish small fishing vessel activity.

Consultation established that fishing activity, including both trawling and potting occurs throughout the Marine Scheme, particularly close to the Landfall in English waters.

132. It is expected that mitigation including having an FLO in place and circulation of information (e.g. via Kingfisher and local communications) will help ensure fishermen are aware of the exposed cable and avoid fishing directly over it. In addition, guard vessels will be used in any areas where cable exposures are considered to present significant risk to fishing gear snagging.

133. The frequency of occurrence during the period that the cables are surface-laid is considered to be remote for the Marine Scheme as a whole.

13.1.15.5.3 Significance of the effect

134. Overall, the severity of consequence is deemed to be serious and the frequency of occurrence is considered to be remote. The effect will, therefore, be of **tolerable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.15.5.4 Secondary mitigation and residual effect

135. A secondary shipping and navigation mitigation has been identified for the impact. The period during which the subsea cables are surface laid and not yet buried or protected – and thus exposed to the impact – should be reduced so far as practicable.

136. Overall, following mitigation, the severity of consequence is deemed to be serious and the frequency of occurrence is considered to be extremely unlikely. The residual effect will, therefore, be of **tolerable (ALARP) adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.16 Potential Effects During Operation and Maintenance

13.1.16.1 INCREASED VESSEL TO VESSEL COLLISION RISK BETWEEN A THIRD-PARTY VESSEL AND A PROJECT VESSEL

137. There will be a requirement to undertake inspection surveys as well as the potential for unplanned repair works on, or reburials of the Offshore Export Cables as a result of cable failure/damage or cable exposure/creation of freespans respectively which could result in an increased collision risk between a third-party vessel and a survey / maintenance vessel.

138. This risk is described under the construction phase, however maintenance/monitoring work is expected to be less disruptive and span a shorter period than cable construction works.

139. The planned protection for the cable should reduce the likelihood of cable damage and thereby requirements for repairs. Where cable repairs or reburials are required, they will be highly localised along the Offshore Export Cable route.

140. Based on the MDS, there may be up to two survey vessels per year required for the maintenance and monitoring works, and up to four cable repairs and up to four cable reburials over the lifetime of the Marine Scheme, although specific locations for repairs and reburials are unknown. Cable repairs / reburials may include vessels which are RAM. As per the construction phase, project vessels will be managed by marine coordination, will display suitable marks and lights, will

broadcast on AIS and be compliant with relevant Flag State and international regulations including the COLREGs and SOLAS.

141. Similarly, to the construction phase, details of major maintenance activities including any advisory safe passing distances, as defined by risk assessment, will be suitably promulgated via NtM, Kingfisher, Radio Navigational Warnings, NAVTEX and/or broadcast warnings to maximise awareness of ongoing major maintenance activities.

13.1.16.1.1 Severity of consequence

142. The most likely consequences in the event of a collision incident between a project vessel and third-party vessel are as per the equivalent construction phase impact, namely minor contact and damage to property and minor reputational effects on business, but no perceptible effect on people. The maximum adverse scenario could involve one of the vessels foundering resulting in PLL and the environmental consequence of pollution. Such a scenario would be more likely if the third-party vessel involved was a small craft which may have weaker structural integrity than a survey or maintenance/repair vessel.

143. The severity of consequence is therefore considered to be moderate.

13.1.16.1.2 Frequency of occurrence

144. The impact will be present throughout the operation and maintenance phase which will last for up to 35 years. With implementation of the designed in measures noted above, it is considered unlikely that an encounter between a third-party vessel and a Project vessel will occur. In the event that such an encounter does occur, collision avoidance action would be implemented by the vessels as per COLREGs, thus ensuring that the likelihood of the encounter developing into a collision incident is very low.

145. The likelihood of an encounter is decreased compared to the construction phase given the smaller scale of maintenance activities, although this is somewhat balanced by the much longer duration of the operation and maintenance phase.

146. The frequency of occurrence is therefore considered to be extremely unlikely for the Marine Scheme as a whole.

13.1.16.1.3 Significance of the effect

147. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.16.1.4 Secondary mitigation and residual effect

148. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.16.2 REDUCED ACCESS TO LOCAL PORTS

149. There is the potential for reduced access to local ports due to maintenance and monitoring of the Offshore Export Cables and potential cable repair/reburial works.

13.1.16.2.1 Severity of consequence

150. The overall timescale for any maintenance / repair works is expected to be less than for construction works. Similarly to the construction phase, details of major maintenance activities including any advisory safe passing distances, as defined by risk assessment, will be suitably promulgated to maximise awareness of ongoing major maintenance activities.

151. Such works may result in limited disruption to vessels crossing the Marine Scheme in English waters to access the Port of Blyth and crossing the Marine Scheme in Scottish waters to access ports in the Firth of Forth. However, any required maintenance is expected to be localised in one area of the export cable and temporary in nature.

152. In addition, maintenance vessels will be managed by marine coordination, will display appropriate marks and lights, broadcast on AIS (where available) and will be compliant with relevant Flag State regulations including the COLREGs, including rule 18 which applies to vessels which are RAM. Liaison with local ports and FLO will help to manage disruption.

153. The severity of consequence is therefore considered to be negligible.

13.1.16.2.2 Frequency of occurrence

154. The reduction in access is decreased compared to the construction phase given the smaller scale of maintenance activities, although this is somewhat balanced by the much longer duration of the operation and maintenance phase.

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

156. In Scottish waters, the frequency of occurrence is considered to be negligible due to the small footprint of the works and ample sea room available.

13.1.16.2.3 Significance of the effect

157. Overall, the severity of consequence is deemed to be negligible and the frequency of occurrence for the Marine Scheme in Scottish waters is considered to be negligible. The effect in Scottish waters will, therefore, be of **broadly acceptable adverse** significance, which is not significant in EIA terms.

158. Overall, the severity of consequence is deemed to be negligible and the frequency of occurrence for the Marine Scheme in English waters is considered to be extremely unlikely. The effect in English waters will, therefore, be of **broadly acceptable adverse** significance, which is not significant in EIA terms.

13.1.16.2.4 Secondary mitigation and residual effect

159. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.16.3 ANCHOR INTERACTION WITH SUBSEA CABLE

160. There is a risk that a vessel anchor interacts with the Offshore Export Cables due to an anchor dragging or emergency anchoring incident, which has been described previously under the description of this impact during the construction phase.

161. High risk areas for an anchor dragging incident are where vessels routinely anchor close to the Offshore Export Cables e.g. near the charted anchorage associated with the Port of Blyth, approximately 2.5 nm south of the Landfall at the southern end of the Marine Scheme in English waters.

162. For emergency anchoring, higher risk areas include areas where the density of vessels crossing the Marine Scheme in Scottish and English waters is higher (taking into consideration future changes in shipping due to the BBWF and areas closer to the coast or to other hazards (e.g. offshore developments), which increases the likelihood of dropping anchor in an emergency.

163. During the operation and maintenance phase the Offshore Export Cables will be marked on UKHO Admiralty Charts with associated note/warning about anchoring, trawling or seabed operations.

164. A CBRA will be undertaken, post-consent, to identify high risk areas from third party hazards including vessel anchor strike along the whole Marine Scheme and to determine suitable burial depths for the Offshore Export Cables during the operation and maintenance phase. Burial is the preferred method for protecting the Offshore Export Cables from vessel anchors. Based on the indicative cable burial appraisal which has been undertaken, the Offshore Export Cables are anticipated to be buried for at least 79% of the route and protected by external protection (which could include the placement of rock) for the remainder of the route. Target burial depths are expected to be between 0.5 m and 3 m. Any external protection used will be designed to ensure the Offshore Export Cables are suitably protected from vessel anchors. Cable protection will be regularly monitored to confirm its integrity.

13.1.16.3.1 Severity of consequence

165. Once the Offshore Export Cables are protected, either through burial and/or other protection measures, larger vessels (e.g. cargo vessels and tankers) are more likely to threaten the Offshore Export Cables as their anchors are able to penetrate deeper into the seabed and can cause greater damage than smaller anchors (fishing and recreational vessels) if contact is made. The anchors of smaller vessels (e.g. fishing and recreational craft) are unlikely to penetrate as deeply. Suitable target burial depths, defined in a CBRA, will mitigate the risk from vessel anchors. Periodic monitoring will be undertaken to confirm cable protection remains suitable as detailed in Volume 2, Chapter 5: Project Description.

166. The most likely consequences are limited damage to property (anchoring vessel or the Offshore Export Cables). The maximum adverse scenario may include damage to property including to the vessel's anchor or subsea cable.

167. The severity of consequence is therefore considered to be minor.

13.1.16.3.2 Frequency of occurrence

168. Protection of the Offshore Export Cables via burial and/or external protection will reduce the frequency of occurrence of anchor interaction.

169. Although there may be limited decision-making time if a vessel is drifting towards a hazard, it is anticipated that the charting of infrastructure including all subsea cables will inform any decision to anchor, as per Regulation 34 of SOLAS (IMO, 1974).

170. The frequency of occurrence is considered to be extremely unlikely for the Marine Scheme as a whole.

13.1.16.3.3 Significance of the effect

171. Overall, the severity of consequence is deemed to be minor and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.16.3.4 Secondary mitigation and residual effect

172. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.16.4 FISHING GEAR INTERACTION WITH SUBSEA CABLE

173. There is a risk of fishing gear interaction with the Offshore Export Cables due to fishing activity, which has been described previously under the description of this impact during the construction phase. High intensity areas for demersal fishing activity occurred along the first 6 nm of the Marine Scheme from the Landfall in English waters, although demersal fishing activity was evident along the whole Marine Scheme albeit at relatively low intensities.

174. During the operation and maintenance phase the Offshore Export Cables will be marked on UKHO Admiralty Charts and KIS-ORCA charts with associated note/warning about anchoring, trawling or seabed operations.

175. A CBRA will be undertaken, post-consent, which will include a detailed assessment of fishing activity along the Offshore Export Cable Corridor and fishing gear penetration depths for the various soil conditions in order to determine suitable burial depths for the Offshore Export Cables during the operation and maintenance phase. Burial is the preferred method for protecting the Offshore Export Cables from fishing gear. Based on the indicative cable burial appraisal which has been undertaken, the Offshore Export Cables are anticipated to be buried between 0.5 m and 3 m for at least 79% of the length of the Marine Scheme, and protected by external cable protection (which could include the placement of rock) where burial is not possible, or target burial depths are not achieved (up to 21% of the total length of the Marine Scheme). In areas where external protection is required, it will be designed to reduce potential snagging risk with fishing gear as far as is practicable, in line with industry best practice guidance (i.e. use of graded rocks and berms profiled with 1:3 gradients). Cable protection will be regularly monitored to confirm its integrity.

13.1.16.4.1 Severity of consequence

176. The planned cable protection is assumed to provide effective mitigation from fishing gear snagging, reducing the risk of serious consequences such as snagging, capsize of the vessel and PLL.

177. The severity of consequence is therefore considered to be minor.

13.1.16.4.2 Frequency of occurrence

178. Once the Offshore Export Cables are installed, their depiction on nautical and Kingfisher charts (designed in mitigation measures) may discourage fishing in the vicinity of the Offshore Export Cables however, evidence shows this is not always the case with installed cables as often it is assumed they are adequately protected against fishing gear interaction. The planned cable protection (through burial and which could include the placement of rock) is assumed to provide effective mitigation against the risk or demersal gear making contact with the installed Offshore Export Cables. As discussed, it is the responsibility of the fishermen to dynamically risk assess

whether it is safe to undertake fishing activities in proximity to subsea cables and to make a decision as to whether or not to fish. Fishing activity is considered further in Volume 2, Chapter 12: Commercial Fisheries, noting that demersal fishing does take place within the Shipping and Navigation Study Area.

179. The frequency of occurrence is considered to be extremely unlikely for the Marine Scheme as a whole.

13.1.16.4.3 Significance of the effect

180. Overall, the severity of consequence is deemed to be minor and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.16.4.4 Secondary mitigation and residual effect

181. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.16.5 VESSEL GROUNDING DUE TO REDUCED UNDER KEEL CLEARANCE

182. This impact refers to a vessel grounding due to reduced under keel clearance associated with external cable protection measures, in areas where cable burial is not achievable (e.g. due to cable crossings or unfavourable seabed conditions). This could lead to subsequent capsize, injury, loss of life, oil spill, etc. In general, the higher risk areas are coastal waters where existing water depths are shallower.

183. Cable burial is the preferred option of safeguarding the Offshore Export Cables, however up to 21% of the length of each of the Offshore Export Cables may require alternative external cable protection. In addition, external cable protection will be required at five anticipated cable crossings as outlined in Table 13.5.

13.1.16.5.1 Severity of consequence

184. Should a vessel grounding occur, the most likely consequences are minor damage to property and minor reputational effects on business but no perceptible effect on people. The maximum adverse scenario may include the vessel foundering resulting in PLL and the environmental consequence of pollution.

185. The severity of consequence is therefore considered to be moderate.

13.1.16.5.2 Frequency of occurrence

186. The likelihood of a grounding is greater for large commercial vessels with deeper draughts, noting that only a minority of vessels recorded in the vessel traffic survey data were deep draught. Areas where water depth is shallower, e.g., close to the Landfall at the southern end of the Marine Scheme in English waters, also present a higher risk of vessels grounding.

187. The maximum height of cable protection will be 1.5 m. The average draught of vessels crossing the Marine Scheme was 5.6 m, with a maximum draught of 21 m, in approximately 60 m of water depth. Within shallower waters (less than 20m depth) near the Landfall in English waters, the maximum draught was 11 m.

188. During consultation, the MCA raised that cable burial depth requires consideration and noted the requirements of MGN 654 (MCA, 2021a). The Applicant intends to follow the guidance provided in MGN 654, and in particular cable protection will not change the charted water depth by more than 5% where possible. Any reduction in navigable water depth greater than 5% will be discussed and agreed with the MCA, Trinity House and the NLB post consent and prior to cable construction as per MGN 654.

189. When considered with the designed-in mitigation of compliance with the requirements in MGN 654 and any change to water depth of more than 5% chart datum requiring further consultation and agreement with the MCA, the frequency is considered to be reduced to very low for all vessel types.

190. For the Marine Scheme in English waters, the frequency of occurrence is therefore considered to be remote.

191. For the Marine Scheme in Scottish waters, the frequency of occurrence is therefore considered to be extremely unlikely.

13.1.16.5.3 Significance of the effect

192. Overall, the severity of consequence is deemed to be moderate, and the frequency of occurrence is considered to be remote for the Marine Scheme in English waters. The effect will, therefore, be of **tolerable adverse** significance, which is not significant in EIA terms.

193. Overall, the severity of consequence is deemed to be moderate, and the frequency of occurrence is considered to be extremely unlikely for the Marine Scheme in Scottish waters. The effect will, therefore, be of **broadly acceptable adverse** significance, which is not significant in EIA terms.

13.1.16.5.4 Secondary mitigation and residual effect

194. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.16.6 INTERFERENCE WITH MAGNETIC COMPASSES

195. A magnetic compass is a navigational instrument for determining direction relative to the earth's magnetic poles. It consists of a magnetised pointer (usually marked on the north end) free to align itself with the earth's magnetic field. Like any magnetic device, compasses are affected by nearby ferrous materials as well as by local electromagnetic forces, such as magnetic fields emitted from power cables. The majority of commercial vessels use a non-magnetic gyrocompass as the primary means of navigation, which is unaffected by the earth’s magnetic field. However, as the magnetic compass still serves as an essential means of navigation in the event of power loss or as a secondary source, it must not be affected to the extent that safe navigation is threatened.

196. The Offshore Export Cables for the Marine Scheme will be HVDC and may therefore result in localised static Electromagnetic Fields (EMF), with the potential to affect magnetic compasses. The important mitigating factors to reduce EMF effects on magnetic compasses are listed below:

- Cable spacing;
- Water depth; and
- Burial depth.

197. The Offshore Export Cables will be installed in pairs (or a pair) of opposite poles (positive and negative), and as such the magnetic fields of each Offshore Export Cables in a pair will be of

opposite polarities. As outlined in Volume 1, Chapter 5: Project Description, it is assumed that the Offshore Export Cables will be laid at approximately 25 m spacing, however a reduction in this distance between Offshore Export Cables of opposite polarity would have an increasingly deleterious effect of the magnetic fields from each cable – effectively cancelling each other out, reducing the resultant magnetic compass deviation. The exact cable design and construction plan (and indeed the location of the Offshore Export Cables within the Marine Scheme) will be informed by further engineering design and outputs from pre-construction surveys. Similarly, a Cable Plan (CaP) will be developed which will provide a more refined level of detail on the construction of the Offshore Export Cables.

198. Regarding water depth, approximately 98% of the Offshore Export Cable Corridor is in depths greater than 20 m below Chart Datum (CD). Therefore, there will be significant vertical distance between the Offshore Export Cables and surface vessels along the majority of the Offshore Export Cable Corridor. The strength of the magnetic fields decreases exponentially with distance from the cables, and as such compass deviation will reduce with increasing water depth. Similarly, increasing burial depth also increases the vertical separation between a surface vessel and the Offshore Export Cables in a given water depth.

199. During consultation, the MCA stated that a deviation of three degrees will be accepted for 95% of the cable route and a five degree deviation accepted for the remaining 5%. Compass deviation effects will be minimised through Offshore Export Cable design and separation distance, informed by compass deviation studies (post consent) to comply with MCA requirements.

13.1.16.6.1 Severity of consequence

200. The majority of commercial vessel traffic uses non-magnetic gyrocompasses as the primary means of navigation, which are unaffected by EMF. Therefore, in general it is considered unlikely that any EMF interference created by the Offshore Export Cables will have a significant impact on vessel navigation near the Marine Scheme. Nevertheless, since magnetic compasses can still serve as an essential means of navigation in the event of power loss, as a secondary source, or as some smaller craft (fishing or leisure) may rely on it as their sole means of navigation (noting that many smaller craft may use Global Positioning System (GPS), chart plotters, etc. as a further source), it has been assessed within this ES chapter. Vessels in shallower water should also be able to navigate visually using coastal features when conditions are suitable.

201. The most likely consequences associated with the maximum adverse scenario are anticipated to be limited, noting that 98% of the Offshore Export Cables are anticipated to be in water depths greater than 20 m and the Offshore Export Cables will be designed to ensure that the requirements of the MCA are fulfilled. If it cannot be demonstrated that the MCA deviation requirements can be met pre-construction, a post construction compass deviation survey of the ‘as laid’ Offshore Export Cable Route will be undertaken. This data will be provided to the MCA and UKHO, and a precautionary notation may be required on the appropriate Admiralty Charts regarding possible magnetic anomalies along the ‘as laid’ Offshore Export Cable Route.

202. The severity of consequence is therefore considered to be minor.

13.1.16.6.2 Frequency of occurrence

203. Along the Marine Scheme vessel traffic is assumed to mainly transit perpendicular to the direction of the Offshore Export Cables. For vessels transiting over the Offshore Export Cables, time spent directly above the Offshore Export Cables will be limited given the limited width of the Marine Scheme.

204. Given HVDC cables produce static magnetic fields which decrease with the horizontal distance from the cables, magnetic compass interference should only be experienced directly above or in direct proximity to the Offshore Export Cables, noting again that effects decrease quickly with horizontal distance as the vessel moves away from the Offshore Export Cables' location.

205. The frequency of occurrence is therefore considered to be extremely unlikely, for the Marine Scheme as a whole.

13.1.16.6.3 Significance of the Effect

206. Overall, the severity of consequence is deemed to be minor and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.16.6.4 Secondary mitigation and residual effect

207. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.17 Potential Effects During Decommissioning

13.1.17.1 INCREASED VESSEL TO VESSEL COLLISION RISK BETWEEN A THIRD-PARTY VESSEL AND A PROJECT VESSEL

208. There may also be an increased collision risk created during the decommissioning phase for all passing traffic due to the presence of vessels associated with decommissioning works.

13.1.17.1.1 Severity of consequence

209. Since the numbers and types of vessels used to remove the Offshore Export Cables are expected to be similar to those used for construction, this impact is expected to be similar in nature to the equivalent construction phase impact.

210. Therefore, the most likely consequences associated with the maximum adverse scenario are as per the equivalent construction phase impact.

211. The severity of consequence is therefore considered to be moderate within both Scottish and English waters.

13.1.17.1.2 Frequency of occurrence

212. The impact will be present throughout the decommissioning phase which is assumed to last for a similar timeframe as the construction period. With the designed in measures previously noted implemented, it is considered unlikely that an encounter between a third-party vessel and a project vessel will occur. As per the equivalent construction phase impact, in the event that such an encounter does occur, collision avoidance action would be implemented by the vessels as per the COLREGs, thus ensuring that the likelihood of the encounter developing into a collision incident is very low.

213. The frequency of occurrence is therefore considered to be extremely unlikely for the Marine Scheme as a whole.

13.1.17.1.3 Significance of the effect

214. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.17.1.4 Secondary mitigation and residual effect

215. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.17.2 VESSEL DISPLACEMENT LEADING TO INCREASED VESSEL TO VESSEL COLLISION RISK BETWEEN THIRD-PARTY VESSELS

216. There may also be a risk of vessel displacement leading to increased vessel to vessel collision risk between third-party vessels created during the decommissioning phase.

13.1.17.2.1 Severity of consequence

217. Since the numbers and types of vessel used to remove the Offshore Export Cables are expected to be similar to those used for construction, this impact is expected to be similar in nature to the equivalent construction phase impact.

218. Therefore, the most likely consequences associated with this impact are as per the equivalent construction phase impact.

219. The severity of consequence is therefore considered to be moderate.

13.1.17.2.2 Frequency of occurrence

220. The impact will be present throughout the decommissioning phase which is assumed to last for a similar timeframe as the construction period. Given that third-party vessels are expected to be compliant with Flag State regulations including the COLREGs, the likes of collision avoidance action ensure that the likelihood of an encounter developing into a collision incident is low. This is furthered by the promulgation of information which will maximise awareness of ongoing decommissioning activities, thus allowing third-party vessels to passage plan in advance.

221. The frequency of occurrence is therefore considered to be extremely unlikely for the Marine Scheme as a whole.

13.1.17.2.3 Significance of the effect

222. Overall, the severity of consequence is deemed to be moderate, and the frequency of occurrence is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole, which is not significant in EIA terms.

13.1.17.2.4 Secondary mitigation and residual effect

223. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.17.3 REDUCED ACCESS TO LOCAL PORTS

224. There may be potential for reduced access to local ports due to decommissioning works.

13.1.17.3.1 Severity of consequence

225. Since the numbers and types of vessels used to remove the Offshore Export Cables are expected to be similar to those used for construction, this impact is expected to be similar in nature to the equivalent construction phase impact.

226. The severity of consequence is therefore considered to be minor.

13.1.17.3.2 Frequency of occurrence

227. The impact will be present throughout the decommissioning phase which is assumed to last for a similar timeframe as the construction period. Since the anticipated reduction in access to local ports and the volumes of vessel traffic accessing the ports are assumed to be the same as for the equivalent construction phase impact, and the appropriate designed in measures are in place, it is anticipated that the frequency of occurrence is similar to the construction phase.

228. For the Marine Scheme in English waters, the frequency of occurrence is therefore considered to be remote.

229. For the Marine Scheme in Scottish waters, the frequency of occurrence is considered to be extremely unlikely.

13.1.17.3.3 Significance of the effect

230. The severity of consequence is deemed to be minor and the frequency of occurrence for the Marine Scheme in Scottish waters is considered to be extremely unlikely. The effect in Scottish waters will, therefore, be of **broadly acceptable adverse** significance, which is not significant in EIA terms.

231. The severity of consequence is deemed to be minor and the frequency of occurrence for the Marine Scheme in English waters is considered to be remote. The effect in English waters will, therefore, be of **broadly acceptable adverse** significance, which is not significant in EIA terms.

13.1.17.3.4 Secondary mitigation and residual effect

232. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

3.13. Proposed Mitigation and Monitoring

233. Proposed additional mitigation measures to ensure tolerable risks are reduced to ALARP are as follows:

- The period during which the Offshore Export Cables are surface laid and not yet buried or protected – and thus exposed to the impact – should be reduced so far as practicable. This reduces the risk of vessel anchors and fishing gear snagging on surface-laid cable should there be a period of time between cable lay and protection when the Offshore Export Cables are surface-laid. Proposed monitoring measures are outlined in Table 13.14 below.

Table 13.14 Monitoring commitments for shipping and navigation

Potential Impact	Monitoring Commitment	Justification for Monitoring	Relevant Jurisdiction and Regulatory Body
Interference with magnetic compasses	A compass deviation modelling study will be undertaken post consent, once the detailed design and cable configuration is available. This will determine whether the compass deviation limits set by the MCA can be met. If it cannot be demonstrated that MCA deviation requirements can be met pre-construction, a post construction compass deviation survey of the 'as laid' Offshore Export Cable Route will be undertaken.	Confirm potential interference with magnetic position fixing equipment	MD-LOT / MMO
Hydrographic surveys	As required by annex 4 of MGN 654, detailed and accurate hydrographic surveys will be undertaken periodically at intervals agreed with the MCA.	Requirement of MGN 654	MD-LOT / MMO

3.14. Cumulative Effects Assessment

13.1.18 Methodology

234. The Cumulative Effects Assessment (CEA) takes into account the impact associated with the Marine Scheme together with other relevant plans, developments and activities. Cumulative effects are therefore the complete set of effects arising from the Marine Scheme together with the effects from a number of different developments, on the same receptor or resource. Please see Volume 2, Chapter 3: EIA Methodology of the Marine ES for detail on CEA methodology.

235. The developments selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise and the development of a ‘long list’ of cumulative developments relevant to the Marine Scheme (see Volume 3, Appendix 3.4). Each development has been considered on a case by case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved, to create the ‘short list’ as summarised in Table 13.15. This approach was agreed during Scoping and further consultation and technical engagement undertaken with consultees, as detailed in Table 13.15.

236. The specific projects scoped into the CEA for shipping and navigation, are outlined in Table 13.15. It should be noted that operational cumulative developments are not considered as the baseline data and assessment takes these developments into consideration.

Table 13.15 List of other developments considered within the CEA for shipping and navigation

Development/Plan	Location	Status	Distance from Marine Scheme (km)	Description of Development /Plan	Dates of Construction (If Applicable)[12]	Dates of Operation (If Applicable)	Overlap with the Marine Scheme
Berwick Bank Wind Farm	Scottish waters	In Planning	0 – direct overlap with Marine Scheme	Offshore wind farm, in planning stage.	2025 to 2033	2033 to 2068	Development Construction Phase overlaps with Marine Scheme Construction Phase
Scotland to England Green Link 1 / Eastern Link 1 (Torness to Hawthorn Pit)	Scottish and English waters	In Planning	0 – direct overlap with Marine Scheme	Interconnector power cable from Torness to Hawthorn Pit in planning stage	2024 to 2027	2027 to 2077	Development Operational Phase overlaps with Marine Scheme Construction / Operational Phases
Eastern Green Link 2 (Peterhead to Drax)	Scottish and English waters	In Planning	3	Interconnector power cable from Peterhead to Drax in planning stage	2026 to 2029	2029 to 2079	Development Construction and Operational Phases overlap with Marine Scheme Construction / Operational Phases
Blyth Demonstrator Offshore Wind Farm – Phase 2	English waters	Consented	1	Consented offshore wind farm with up to 10 wind turbines (across two array areas).	Unknown	Unknown	Development Construction and Operational Phases may overlap with Marine Scheme Construction / Operational Phases
Blyth Demonstrator Phase 2 (&3) Cable Corridor	English waters	Consented	0 – potential for direct overlap at Landfall site	Export cable corridor from consented Blyth Demonstrator Offshore Wind Farm (Phase 2&3) to Landfall at Cambois Bay	Unknown	Unknown	Development Construction and Operational Phases may overlap with Marine Scheme Construction / Operational Phases
Inch Cape Offshore Wind Farm	Scottish waters	Consented	19	Consented offshore wind farm with up to 72 wind turbines, awarded a Contracts for Difference (CfD) in July 2022	2023 to 2025	2025 to 2075	Development Operational Phase overlaps with Marine Scheme Construction / Operational Phases

[12] Construction programme for the Marine Scheme is anticipated to be from Q4 2026 to Q4 2029

Development/Plan	Location	Status	Distance from Marine Scheme (km)	Description of Development /Plan	Dates of Construction (If Applicable)[12]	Dates of Operation (If Applicable)	Overlap with the Marine Scheme
Neart Na Gaoithe Offshore Wind Farm	Scottish waters	Under Construction	17	Offshore wind farm with 56 wind turbines currently under construction including buoyed construction area	2022 to 2024	2024 to 2049	Development Operational Phase overlaps with Marine Scheme Construction / Operational Phases
Seagreen 1	Scottish waters	Under Construction	5	Offshore wind farm with 150 wind turbines currently under construction including buoyed construction area	2022 to 2023	2023 to 2048	Development Operational Phase overlaps with Marine Scheme Construction / Operational Phases
Seagreen 1A Project	Scottish waters	Consented	23	Export cable corridor from consented Seagreen wind farm to Landfall at Cockenzie	2024 to 2026	Unknown	Development Operational Phase overlaps with Marine Scheme Construction / Operational Phases
Inch Cape OFTO	Scottish waters	Consented – pending variation	10	Export cable corridor from consented Inch Cape offshore wind farm to Landfall at Cockenzie	2022 to 2025	2025 to 2075	Development Operational Phase overlaps with Marine Scheme Construction / Operational Phases
Neart Na Gaoithe OFTO	Scottish waters	Under Construction	22	Export cable corridor from consented Neart na Gaoithe offshore wind farm to Landfall at Thorntonloch Beach	2020 to 2024	2024 to 2047	Development Operational Phase overlaps with Marine Scheme Construction / Operational Phases

13.1.19 Cumulative Effects Assessment

237. An assessment of the likely significance of the cumulative effects of the Marine Scheme together with other relevant plans, developments and activities upon shipping and navigation receptors arising from each identified impact is given below.

238. It should be noted that the Marine Scheme and BBWF overlap both spatially (within the BBWF array area) and temporally (with regards to construction, operation and maintenance and decommissioning). As the Marine Scheme and BBWF are both being progressed by the Applicant, it is expected that both developments will be jointly coordinated using the same Marine Coordination Centre for all phases of each development. Therefore, this allows potential cumulative effects between these developments to be managed through coordination.

13.1.19.1 POTENTIAL EFFECTS DURING CONSTRUCTION

13.1.19.1.1 INCREASED VESSEL TO VESSEL COLLISION RISK BETWEEN A THIRD-PARTY VESSEL AND A PROJECT VESSEL

239. There is the potential for increased collision risk if cumulative developments encourage third party vessels to deviate towards the Project vessels. In particular, cumulative developments with overlapping construction phases, including BBWF in Scottish waters, and the Scotland England Green Link 1 and Eastern Green Link 2 transmission cables in both Scottish and English waters, could lead to increased collision risk if construction works were to take place in a similar geographical area at a similar time. There is also potential for the Blyth Demo Phase 2 to overlap temporally with the Marine Scheme in English waters although no construction dates are available.

240. In addition, the Inch Cape, Neart Na Gaoithe, Seagreen and Seagreen 1A OWFs will be operational before construction starts on the Marine Scheme and there may therefore be increased vessel numbers associated with these developments in Scottish waters. However, based on the locations of the operations and maintenance bases relative to the wind farms and to the Marine Scheme (Montrose Port for Inch Cape, Seagreen and Seagreen 1A, Eyemouth Harbour for Neart Na Gaoithe), vessel movements between the OWFs and the ports are not expected to interact with the Marine Scheme construction works in Scottish waters.

241. Project vessels, as managed by marine coordination, will display suitable marks and lights, will broadcast on AIS (where appropriate) and will be compliant with relevant Flag State regulations including the COLREGs and SOLAS.

242. Details of construction activities, including any advisory safe passing distances, as defined by risk assessment, will be suitably promulgated via NtM, Kingfisher, Radio Navigational Warnings, NAVTEX and/or broadcast warnings to maximise awareness of ongoing construction activities. Communication with the Port of Blyth about the construction work activities in English waters and appointment of an FLO will also help to raise awareness of the works and minimise collision risk. Guard vessels will be used to raise awareness of construction work to passing vessels and temporary aids to navigation will be deployed (if required) to guide vessels around any areas of construction activities.

243. Collision incidents are local in nature, occurring only when two (or more) vessels pass within a small distance of each other within the same sea area. Accounting for the distance between the Marine Scheme and the cumulative developments, the temporary nature of the construction works and noting that there is a low likelihood that construction works for the Marine Scheme and

cumulative developments will be required within the same geographical area at the same time, the impact is as per the equivalent construction phase impact for the Marine Scheme in isolation.

13.1.19.1.1.1 Severity of Consequence

244. The most likely consequences in the event of a collision incident between a Project vessel and third-party vessel are minor contact between the vessels resulting in minor damage to property and minor reputational effects on business but no perceptible effect on people. The worst case scenario could involve one of the vessels foundering resulting in PLL and the environmental consequence of pollution. Such a scenario would be more likely if the third-party vessel involved was a small craft which may have weaker structural integrity than a commercial vessel.

245. The severity of consequence is therefore considered to be moderate in both Scottish and English waters.

13.1.19.1.1.2 Frequency of Occurrence

246. The impact will be present throughout the construction phase which will last for up to 18 months (39 months including site preparation works). With the designed-in measures noted above implemented, it is considered unlikely that an encounter between a third-party vessel and a project vessel will occur. In the event that such an encounter does occur, collision avoidance action would be implemented by the vessels as per the COLREGs, thus ensuring that the likelihood of the encounter developing into a collision incident is very low.

247. The frequency of occurrence is therefore considered to be extremely unlikely.

13.1.19.1.1.3 Significance of effect

248. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.1.1.4 Secondary mitigation and residual effect

249. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.1.2 VESSEL DISPLACEMENT LEADING TO INCREASED VESSEL TO VESSEL COLLISION RISK BETWEEN THIRD-PARTY VESSELS

250. There is the potential for increased collision risk between third-party vessels if cumulative developments lead to further displacement of vessels around the developments. In particular, cumulative developments with overlapping construction phases, including BBWF in Scottish waters and the Scotland England Green Link 1 and Eastern Green Link 2 transmission cables in both Scottish and English waters, could lead to increased collision risk if construction works were to take place in a similar geographical area at a similar time. There is also potential for the Blyth Demo Phase 2 in English waters to overlap temporally although no construction dates are available.

251. In addition, the Inch Cape, Neart Na Gaoithe, Seagreen and Seagreen 1A OWFs will be operational before construction starts on the Marine Scheme and therefore there may be increased vessel numbers associated with these developments in Scottish waters. However, vessel movements between the OWFs and the ports are not expected to interact with the Marine Scheme construction works.

252. Details of construction activities, including any advisory safe passing distances, as defined by risk assessment, will be suitably promulgated via NtMs, Kingfisher, Radio Navigational Warnings, NAVTEX and/or broadcast warnings to maximise awareness of ongoing construction activities. Guard vessels will be used to raise awareness of construction works to passing vessels and communication with the Port of Blyth will help to minimise collision risk associated with vessels using the port in English waters.

253. The appointment of an FLO will aid in ensuring local fishermen are made aware of construction works. Local Notices to Mariners as well as notifying local marinas and sailing clubs of the works will help to inform recreational users. All vessels will be expected to comply with international marine legislation, including the COLREGs and SOLAS.

254. Collision incidents are local in nature, occurring only when two (or more) vessels pass within a small distance of each other within the same sea area. Accounting for the distance between the Marine Scheme and the cumulative developments, the temporary nature of the construction works and noting that there is a low likelihood that construction works for the Marine Scheme and cumulative developments will be required within the same geographical area at the same time, the impact is as per the equivalent construction phase impact for the Marine Scheme in isolation.

13.1.19.1.2.1 Severity of Consequence

255. In the event of a collision incident between third-party vessels, the most likely consequences are minor contact between the vessels resulting in minor damage to property and minor reputational effects on business but no perceptible effect on people. The worst case scenario could involve one of the vessels foundering resulting in PLL and the environmental consequence of pollution. Such a scenario would be more likely if one of the vessels involved was a small craft which may have weaker structural integrity than a commercial vessel.

256. The severity of consequence is therefore considered to be moderate.

13.1.19.1.2.2 Frequency of Occurrence

257. The impact will be present throughout the construction phase which will last for up to 18 months (39 months including site preparation works). Given that third-party vessels are expected to be compliant with relevant Flag State regulations including the COLREGs, collision avoidance action ensure that the likelihood of an encounter developing into a collision incident is low. This is furthered by the promulgation of information which will maximise awareness of ongoing construction activities, thus allowing third-party vessels to passage plan in advance, if considered appropriate.

258. The frequency of occurrence is therefore considered to be extremely unlikely.

13.1.19.1.2.3 Significance of effect

259. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.1.2.4 Secondary mitigation and residual effect

260. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.1.3 Reduced Access to Local Ports

261. There is the potential for increased disruption to port access due to cumulative developments, particularly if the Blyth Demo Phase 2 construction works were to overlap temporally with the Marine Scheme construction works in English waters.

262. The Neart Na Gaoithe OWF is located between the Marine Scheme and entrance to the Firth of Forth, which could lead to increased disruption to access to Forth ports in Scottish waters, however given the distance between the Marine Scheme and Forth ports, there is considered to be sufficient sea room for vessels approaching the ports. Increased risk from other cumulative developments is expected to be minimal due to the distance of these developments from the Port of Blyth or Forth ports.

263. Project vessels will be managed by marine coordination, will display appropriate marks and lights, broadcast on AIS (where available) and will be compliant with relevant Flag State regulations including the COLREGs, including rule 18 which applies to vessels which are RAM. Liaison with local ports and FLO will help to manage disruption.

264. With the designed in measures listed above, the effect due to the presence of cumulative developments is anticipated to be manageable.

13.1.19.1.3.1 Severity of Consequence

265. Surveys, seabed preparation and construction of the Offshore Export Cables may result in some disruption to vessels crossing the Marine Scheme in and out of the Port of Blyth in English waters and to vessels crossing the Marine Scheme in the outer Firth of Forth, on route to Forth Ports, in Scottish waters, due to the presence of vessels which may be RAM, such as a cable laying vessel. The Offshore Export Cables are expected to be installed in phases which will restrict any disruption to only a small portion of the total Marine Scheme.

266. Given the distance between the Landfall area and the Port of Blyth in English waters, and the close proximity of Landfall works to the coastline, reduced access during Landfall works is not anticipated.

267. The severity of consequence is therefore considered to be minor.

13.1.19.1.3.2 Frequency of Occurrence

268. The impact will be present throughout the construction phase which will last for up to 18 months (39 months including site preparation works). An average of nine vessels per day accessed the Port of Blyth based on the AIS data. Cumulative developments may lead to an increase in the number of vessels accessing the Port in English waters.

269. However, due to the distance between the Port of Blyth and the Marine Scheme, and the localised and temporary nature of cable construction works, the disruption to port access is reduced. This impact will be mitigated by good communication using approaches set out in Table 13.13 with the Port of Blyth during the construction phase.

270. For the Marine Scheme in English waters, the frequency of occurrence is therefore considered to be remote.

271. In Scottish waters, the Marine Scheme lies 33 nm to the east of the entrance to the Firth of Forth and therefore the frequency of occurrence is considered to be extremely unlikely.

13.1.19.1.3.3 Significance of effect

272. Overall, the severity of consequence is deemed to be minor and the frequency of occurrence for the Marine Scheme in Scottish waters is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme in Scottish waters cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

273. The severity of consequence is deemed to be minor and the frequency of occurrence for the Marine Scheme in English waters is considered to be remote. The effect in English waters will, therefore, be of broadly acceptable adverse significance for the Marine Scheme in English waters cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.1.3.4 Secondary mitigation and residual effect

274. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.1.4 Anchor interaction with exposed subsea cable between cable laying and protection campaigns

275. The risk of anchor interaction with the Offshore Export Cable during the construction phase could be increased if cumulative developments are expected to lead to increased traffic across the Marine Scheme. Any deviation in traffic associated with the BBWF has been taken into consideration in the assessment in isolation.

276. The Blyth Demo Phase 2 in particular may cause slight deviations in traffic across the Marine Scheme in English waters should this development be under construction or operational prior to the construction phase of the Marine Scheme, however given the nature of the vessel traffic crossing the Marine Scheme, deviated traffic is expected to follow similar routes to existing traffic.

277. Given the distance of the other cumulative developments relative to the Marine Scheme, there is limited additional effect due to the presence of these developments.

278. Therefore, the impact is as per the equivalent construction phase impact for the Marine Scheme in isolation.

13.1.19.1.4.1 Severity of Consequence

279. While exposed any vessel anchor could interact with the cables. If an anchor becomes snagged on the cables, there could be a risk of injury in trying to free it. If the anchor cannot be freed the safest action is to slip it, and not attempt to raise or cut the cable.

280. The most likely consequences are limited damage to property (anchoring vessel or subsea cable). The maximum adverse scenario may include damage to property including to the vessel's anchor or subsea cable.

281. The severity of consequence is therefore considered to be moderate.

13.1.19.1.4.2 Frequency of Occurrence

282. Mitigation includes circulation of information to make mariners aware of the exposed cable and use of guard vessels where cable exposures are considered to present significant risk to navigation.

283. The frequency of occurrence is considered to be extremely unlikely.

13.1.19.1.4.3 Significance of effect

284. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.1.4.4 Secondary mitigation and residual effect

285. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.1.5 Fishing gear interaction with exposed subsea cable between laying and protection campaigns

286. The risk of fishing gear interaction with the Offshore Export Cable during the construction phase could be increased if cumulative developments are expected to lead to increased fishing activity across the Marine Scheme.

287. Any displacement of fishing vessels into the Marine Scheme is expected to be minimal. Therefore, the impact is as per the equivalent construction phase impact for the Marine Scheme in isolation.

288. Designed in measures including having an FLO in place and circulation of information (e.g. via Kingfisher and local communications) will help ensure any displaced fishermen are aware of the exposed cable and avoid fishing directly over it. In addition, guard vessels will be used in any areas where cable exposures are considered to present significant risk to fishing gear snagging.

13.1.19.1.5.1 Severity of Consequence

289. The most likely consequences are as per the equivalent impact for the Marine Scheme in isolation.

290. The severity of consequence is therefore considered to be serious.

13.1.19.1.5.2 Frequency of Occurrence

291. The frequency of occurrence during the period that the cables are surface-laid is considered to be remote.

13.1.19.1.5.3 Significance of effect

292. Overall, the severity of consequence is deemed to be serious and the frequency of occurrence is considered to be remote. The cumulative effect will, therefore, be of **tolerable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.1.5.4 Secondary mitigation and residual effect

293. A secondary shipping and navigation mitigation has been identified for the impact. The period during which the subsea cables are surface laid and not yet buried or protected – and thus exposed to the impact – should be reduced so far as practicable.

294. Overall, following mitigation, the severity of consequence is deemed to be serious and the frequency of occurrence is considered to be extremely unlikely. The residual effect will, therefore be of **tolerable adverse** significance which is not significant in EIA terms.

13.1.19.2 POTENTIAL EFFECTS DURING OPERATION AND MAINTENANCE

13.1.19.2.1 INCREASED VESSEL TO VESSEL COLLISION RISK BETWEEN A THIRD-PARTY VESSEL AND A PROJECT VESSEL

295. As per the equivalent construction phase impact, there is the potential for increased collision risk if cumulative developments encourage third party vessels to deviate towards vessels involved in surveys or cable repairs. Maintenance/monitoring work is expected to be less disruptive and span a shorter period than cable construction works.

296. As per the construction phase, project vessels will be managed by marine coordination, will display suitable marks and lights, will broadcast on AIS and be compliant with relevant Flag State and international regulations including the COLREGs and SOLAS.

297. Similar to the construction phase, details of major maintenance activities including any advisory safe passing distances, as defined by risk assessment, will be suitably promulgated via NtM, Kingfisher, Radio Navigational Warnings, NAVTEX and/or broadcast warnings to maximise awareness of ongoing major maintenance activities.

298. As per the equivalent construction phase impact, collision incidents are local in nature, occurring only when two (or more) vessels pass within a small distance of each other within the same sea area. Therefore, the impact is as per the equivalent operation and maintenance phase impact for the Marine Scheme in isolation.

13.1.19.2.1.1 Severity of Consequence

299. The most likely consequences in the event of a collision incident between a Project vessel and third-party vessel are minor contact between the vessels resulting in minor damage to property and minor reputational effects on business but no perceptible effect on people. The maximum adverse scenario could involve one of the vessels foundering resulting in Potential Loss of Life (PLL) and the environmental consequence of pollution. Such a scenario would be more likely if the third-party vessel involved was a small craft which may have weaker structural integrity than a commercial vessel.

300. The severity of consequence is therefore considered to be moderate.

13.1.19.2.1.2 Frequency of Occurrence

301. The impact will be present throughout the operation and maintenance phase which will last for up to 35 years. With implementation of the designed in measures noted above, it is considered unlikely that an encounter between a third-party vessel and a Project vessel will occur. In the event that such an encounter does occur, collision avoidance action would be implemented by the vessels as per COLREGs, thus ensuring that the likelihood of the encounter developing into a collision incident is very low.

302. The likelihood of an encounter is decreased compared to the construction phase given the smaller scale of maintenance activities, although this is somewhat balanced by the much longer duration of the operation and maintenance phase.

303. The frequency of occurrence is therefore considered to be extremely unlikely.

13.1.19.2.1.3 Significance of effect

304. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.2.1.4 Secondary mitigation and residual effect

305. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.2.2 Reduced access to local ports

306. There is the potential for increased disruption to port access during the operational phase due to cumulative developments, for example if surveys or repairs close to the Landfall in English waters overlap temporally with other cumulative developments.

307. Similar to the construction phase, details of major maintenance activities including any advisory safe passing distances, as defined by risk assessment, will be suitably promulgated to maximise awareness of ongoing major maintenance activities.

308. Maintenance / repair vessels will be managed by marine coordination, will display appropriate marks and lights, broadcast on AIS and will be compliant with relevant Flag State regulations including the COLREGs, including rule 18 which applies to vessels which are RAM. Liaison with local ports and FLO will help to manage disruption. Therefore the impact is as per the equivalent operation and maintenance phase impact for the Marine Scheme in isolation.

13.1.19.2.2.1 Severity of Consequence

309. The overall timescale for any maintenance / repair works is expected to be less than for construction works. Such works may result in limited disruption to vessels crossing the Marine Scheme in English waters to access the Port of Blyth and crossing the Marine Scheme in Scottish waters to access ports in the Firth of Forth. Any required maintenance is expected to be localised in one area of the Marine Scheme and temporary in nature.

310. The severity of consequence is therefore considered to be negligible.

13.1.19.2.2.2 Frequency of Occurrence

311. The reduction in access is decreased compared to the construction phase given the smaller scale of maintenance activities, although this is somewhat balanced by the much longer duration of the operation and maintenance phase.

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

313. In Scottish waters, the frequency of occurrence is considered to be negligible due to the small footprint of the works and ample sea room available.

13.1.19.2.2.3 Significance of the effect

314. Overall, the severity of consequence is deemed to be negligible and the frequency of occurrence for the Marine Scheme in Scottish waters is considered to be negligible. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme in Scottish waters

cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

315. Overall, the severity of consequence is deemed to be negligible and the frequency of occurrence for the Marine Scheme in English waters is considered to be extremely unlikely. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme in English waters cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.2.2.4 Secondary mitigation and residual effect

316. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.2.3 Anchor Interaction with Subsea Cable

317. The risk of anchor interaction with the Offshore Export Cable during the operational phase could be increased if cumulative developments are expected to lead to increased traffic across the Marine Scheme. Any deviation in traffic associated with the BBWF has been taken into consideration in the assessment in isolation.

318. The Blyth Demo Phase 2 in particular may cause slight deviations in traffic across the Marine Scheme in English waters, although it is assumed that this will be taken into consideration in the CBRA when defining suitable cable protection.

319. Given the distance of the other cumulative developments relative to the Marine Scheme, there is limited additional effect due to the presence of these developments.

320. During the operation and maintenance phase the cables will be marked on UKHO Admiralty Charts with associated note/warning about anchoring, trawling or seabed operations.

321. Therefore, the impact is as per the equivalent operational phase impact for the Marine Scheme in isolation.

13.1.19.2.3.1 Severity of Consequence

322. Once the cables are protected, either through burial and/or other protection measures, larger vessels (e.g. cargo vessels and tankers) are more likely to threaten the cables as their anchors are able to penetrate deeper into the seabed and can cause greater damage than smaller anchors (fishing and recreational vessels) if contact is made. The anchors of smaller vessels (e.g. fishing and recreational craft) are unlikely to penetrate as deeply. Suitable target burial depths, defined in a CBRA, will mitigate the risk from vessel anchors. Periodic monitoring will be undertaken to confirm cable protection remains suitable as detailed in Volume 2, Chapter 5: Project Description.

323. The most likely consequences are limited damage to property (anchoring vessel or subsea cable). The maximum adverse scenario may include damage to property including to the vessel's anchor or subsea cable.

324. The severity of consequence is therefore considered to be minor.

13.1.19.2.3.2 Frequency of Occurrence

325. Protection of the cables via burial and/or external protection will reduce the frequency of occurrence of anchor interaction.

326. Although there may be limited decision-making time if a vessel is drifting towards a hazard, it is anticipated that the charting of infrastructure including all subsea cables will inform any decision to anchor, as per Regulation 34 of SOLAS (IMO, 1974).

327. The frequency of occurrence is considered to be extremely unlikely.

13.1.19.2.3.3 Significance of effect

328. Overall, the severity of consequence is deemed to be minor and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.2.3.4 Secondary mitigation and residual effect

329. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.2.4 Fishing Gear Interaction with Subsea Cable

330. The risk of fishing gear interaction with the Offshore Export Cable during the operational phase could be increased if cumulative developments are expected to lead to increased fishing activity across the Marine Scheme.

331. Any displacement of fishing vessels into the Marine Scheme is expected to be minimal. Therefore, the impact is as per the equivalent operational phase impact for the Marine Scheme in isolation.

332. During the operation and maintenance phase the cables will be marked on UKHO Admiralty Charts and KIS-ORCA charts with associated note/warning about anchoring, trawling or seabed operations.

333. A CBRA will be undertaken to provide a detailed assessment of fishing activity along the Marine Scheme and fishing gear penetration depths for the various soil conditions in order to determine suitable protection measures for the cables during the operation and maintenance phase.

13.1.19.2.4.1 Severity of Consequence

334. The planned cable protection is assumed to provide effective mitigation from fishing gear snagging, reducing the risk of serious consequences such as snagging, capsize of the vessel and PLL.

335. The severity of consequence is therefore considered to be minor.

13.1.19.2.4.2 Frequency of Occurrence

336. The frequency of occurrence is considered to be extremely unlikely.

13.1.19.2.4.3 Significance of effect

337. Overall, the severity of consequence is deemed to be minor and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.2.4.4 Secondary mitigation and residual effect

338. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.2.5 Vessel grounding due to reduced under keel clearance

339. There could be an increased risk of vessel grounding due to reduced under keel clearance if cumulative projects were to lead to additional vessel movements over the Marine Scheme, particularly in areas where water depths are shallow.

340. The Blyth Demo Phase 2 in particular may cause slight deviations in traffic across the Marine Scheme in English waters, however given the nature of the vessel traffic crossing the Marine Scheme, deviated traffic is expected to follow similar routes to existing traffic.

341. Given the distance of the other cumulative developments relative to the cable route, there is limited additional effect due to the presence of these developments.

342. Therefore, the impact is as per the equivalent operational phase impact for the Marine Scheme in isolation.

13.1.19.2.5.1 Severity of Consequence

343. Should a vessel grounding occur, the most likely consequences are minor damage to property and minor reputational effects on business but no perceptible effect on people. The maximum adverse scenario may include the vessel foundering resulting in PLL and the environmental consequence of pollution.

344. The severity of consequence is therefore considered to be moderate.

13.1.19.2.5.2 Frequency of Occurrence

345. For the Marine Scheme in English waters, the frequency of occurrence is therefore considered to be remote.

346. For the Marine Scheme in Scottish waters, the frequency of occurrence is therefore considered to be extremely unlikely.

13.1.19.2.5.3 Significance of the Effect

347. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be remote for the Marine Scheme in English waters. The effect will, therefore, be of **tolerable adverse** significance for the Marine Scheme in English waters cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

348. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely for the Marine Scheme in Scottish waters. The effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme in Scottish waters cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.2.5.4 Secondary mitigation and residual effect

349. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.2.6 Interference with magnetic Compasses

350. Interference with magnetic position fixing equipment is local in nature, occurring only when a vessel is located in proximity to a subsea cable. Accounting for the distance between the Marine Scheme

and the cumulative developments, it is not anticipated that the presence of the cumulative developments will result in any change to this impact.

13.1.19.2.6.1 Severity of Consequence

351. The severity of consequence is considered to be minor.

13.1.19.2.6.2 Frequency of Occurrence

352. The frequency of occurrence is considered to be extremely unlikely.

13.1.19.2.6.3 Significance of the Effect

353. Overall, the severity of consequence is deemed to be minor, and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.2.6.4 Secondary mitigation and residual effect

354. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.3 POTENTIAL EFFECTS DURING DECOMMISSIONING

13.1.19.3.1 Increased vessel to vessel collision risk between a third-party vessel and a project vessel

355. There may also be an increased collision risk created during the decommissioning phase if decommissioning works were to overlap temporally with maintenance or decommissioning works associated with the cumulative development. for all passing traffic due to the presence of vessels associated with decommissioning works.

13.1.19.3.1.1 Severity of Consequence

356. Since the numbers and types of vessel used to remove the Offshore Export Cables are expected to be similar to those used for construction, this impact is expected to be similar in nature to the equivalent construction phase impact.

357. The severity of consequence is therefore considered to be moderate.

13.1.19.3.1.2 Frequency of Occurrence

358. The impact will be present throughout the decommissioning phase which is assumed to last for a similar timeframe as the construction period. With the designed in measures previously noted implemented, it is considered unlikely that an encounter between a third-party vessel and a project vessel will occur. As per the equivalent construction phase impact, in the event that such an encounter does occur, collision avoidance action would be implemented by the vessels as per the COLREGs, thus ensuring that the likelihood of the encounter developing into a collision incident is very low.

359. The frequency of occurrence is therefore considered to be extremely unlikely.

13.1.19.3.1.3 Significance of the effect

360. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.3.1.4 Secondary mitigation and residual effect

361. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.19.3.2 Vessel Displacement leading to increased vessel to vessel collision risk between third-party vessels

362. There may also be a risk of vessel displacement leading to increased vessel to vessel collision risk between third-party vessels created during the decommissioning phase if cumulative developments lead to further displacement of vessels around the developments.

13.1.19.3.2.1 Severity of consequence

363. Since the numbers and types of vessel used to remove the Offshore Export Cables are expected to be similar to those used for construction, this impact is expected to be similar in nature to the equivalent construction phase impact.

364. The severity of consequence is therefore considered to be moderate.

13.1.19.3.2.2 Frequency of Occurrence

365. The impact will be present throughout the decommissioning phase which is assumed to last for a similar timeframe as the construction period. Given that third-party vessels are expected to be compliant with Flag State regulations including the COLREGs, the likes of collision avoidance action ensure that the likelihood of an encounter developing into a collision incident is low. This is furthered by the promulgation of information which will maximise awareness of ongoing decommissioning activities, thus allowing third-party vessels to passage plan in advance.

366. The frequency of occurrence is therefore considered to be extremely unlikely.

13.1.19.3.2.3 Significance of the effect

367. Overall, the severity of consequence is deemed to be moderate and the frequency of occurrence is considered to be extremely unlikely. The cumulative effect will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme as a whole cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.3.2.4 Secondary mitigation and residual effect

368. No secondary shipping and navigation mitigation is considered necessary because the impact in the absence of further mitigation is not significant in EIA terms.

13.1.19.3.3 Reduced access to local ports

369. There may be potential for further reduced access to local ports during the decommissioning phase if maintenance or decommissioning works associated with cumulative developments were to overlap temporally with the decommissioning of the Marine Scheme.

370. Project vessels will be managed by marine coordination, will display appropriate marks and lights, broadcast on AIS (where available) and will be compliant with relevant Flag State regulations including the COLREGs, including rule 18 which applies to vessels which are RAM. Liaison with local ports and FLO will help to manage disruption.

371. With the designed in measures listed above, the effect due to the presence of cumulative developments is anticipated to be manageable.

13.1.19.3.3.1 Severity of Consequence

372. Since the numbers and types of vessels used to remove the Offshore Export Cables are expected to be similar to those used for construction, this impact is expected to be similar in nature to the equivalent construction phase impact.

373. The severity of consequence is therefore considered to be minor.

13.1.19.3.3.2 Frequency of Occurrence

374. The impact will be present throughout the decommissioning phase which is assumed to last for a similar timeframe as the construction period. Cumulative developments may lead to an increase in the number of vessels crossing the Marine Scheme in English waters to access the Port of Blyth and crossing the Marine Scheme in Scottish waters to access ports in the Firth of Forth.

375. However, due to the distance between the ports and the Marine Scheme, and the localised and temporary nature of decommissioning works, the disruption to port access is reduced.

376. For the Marine Scheme in English waters, the frequency of occurrence is therefore considered to be remote.

377. For the Marine Scheme in Scottish waters, the frequency of occurrence is considered to be extremely unlikely.

13.1.19.3.3.3 Significance of the effect

378. The severity of consequence is deemed to be minor and the frequency of occurrence for the Marine Scheme in Scottish waters is considered to be extremely unlikely. The effect in Scottish waters will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme in Scottish waters cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

379. The severity of consequence is deemed to be minor and the frequency of occurrence for the Marine Scheme in English waters is considered to be remote. The effect in English waters will, therefore, be of **broadly acceptable adverse** significance for the Marine Scheme in English waters cumulatively with other relevant plans, developments and activities, which is not significant in EIA terms.

13.1.19.3.3.4 Secondary mitigation and residual effect

380. Given that there are no likely significant effects in EIA terms, secondary mitigation is not required.

13.1.20 Proposed Monitoring

381. No additional monitoring beyond that outlined in Table 13.14 for shipping and navigation is required.

3.15. Inter-Related Effects

382. Inter-related effects are the potential effects of multiple impacts, effecting one receptor or a group of receptors. Inter-related effects include interactions between the impacts of the different stages of the Marine Scheme (i.e. interaction of impacts across construction, operation and maintenance and decommissioning), as well as the interaction between impacts on a receptor within a project stage. A description of the likely inter-related effects arising from the Marine Scheme on shipping and navigation is provided below.

383. Displacement of commercial fishing vessels from fishing grounds may lead to an increase in vessel to vessel collision risk between third-party vessels. However, as this is already considered within the shipping and navigation chapter these inter-related effects are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phases. Therefore, these inter-related effects would not be significant in EIA terms.

384. These inter-related effects as described above are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phases. Therefore, these inter-related effects would not be significant in EIA terms.

3.16. Transboundary Effects

385. Transboundary effects arise when impacts from a development within one European Economic Area (EEA) state's territory affects the environment of another EEA state(s).

386. Since international shipping has been included in the baseline assessment, there is no potential for transboundary impacts upon shipping and navigation receptors due to construction, operation and maintenance and decommissioning of the Marine Scheme. Therefore, transboundary effects for shipping and navigation receptors do not need to be considered further. Scoping out of transboundary effects was agreed in the Scoping Opinions provided by MD-LOT and MMO as outlined in Table 13.3.

3.17. Summary of Impacts, Mitigation Measures, Likely Significant Effects and Monitoring

387. Information on shipping and navigation within the Shipping and Navigation Study Area was collected through desktop review and consultation. Table 13.16 presents a summary of the potential impacts, mitigation measures and the conclusion of likely significant effects in EIA terms in respect to shipping and navigation. The impacts assessed include:

- Increased vessel to vessel collision risk between a third-party vessel and a project vessel;
- Vessel displacement leading to increased vessel to vessel collision risk between third-party vessels;
- Reduced access to local ports;
- Anchor interaction with subsea cable;
- Fishing gear interaction with subsea cable;
- Vessel grounding due to reduced under keel clearance; and
- Interference with magnetic compasses.

388. Overall, it is concluded that there will be no likely significant effects arising from the Marine Scheme during the construction, operation and maintenance or decommissioning phases.

389. Table 13.17 presents a summary of the potential cumulative impacts, mitigation measures and the conclusion of likely significant effects on shipping and navigation in EIA terms. The cumulative effects assessed include all those assessed in the in isolation assessment. Overall, it is concluded that there will be no likely significant cumulative effects from the Marine Scheme alongside other developments/plans.

Table 13.16 Summary of potential likely significant effects, mitigation and monitoring

Description of Impact	Phase			Severity of Consequence	Frequency of Occurrence	Significance of Effect	Secondary Mitigation	Residual Effect	Proposed Monitoring
	C	O	D						
Increased vessel to vessel collision risk between a third-party vessel and a project vessel	✓	✓	✓						
Marine Scheme overall				Moderate	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Vessel displacement leading to increased vessel to vessel collision risk between third-party vessels	✓	X	✓						
Marine Scheme overall				Moderate	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Reduced access to local ports	✓	X	✓						
Scottish waters				Minor	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
English waters				Minor	Remote	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Reduced access to local ports									

Description of Impact	Phase			Severity of Consequence	Frequency of Occurrence	Significance of Effect	Secondary Mitigation	Residual Effect	Proposed Monitoring
	C	O	D						
	X	✓	X						
Scottish waters				Negligible	Negligible	Broadly Acceptable	N/A	Broadly Acceptable	N/A
English waters				Negligible	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Anchor interaction with exposed subsea cable between cable laying and protection campaigns	✓	X	X						
Marine Scheme overall				Moderate	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Anchor interaction with subsea cable	X	✓	X						
Marine Scheme overall				Minor	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Fishing gear interaction with exposed subsea cable between laying and protection campaigns	✓	X	X						
Marine Scheme overall				Serious	Remote	Tolerable	Reducing of period between surface laying and burial/	Tolerable (ALARP)	N/A

Description of Impact	Phase			Severity of Consequence	Frequency of Occurrence	Significance of Effect	Secondary Mitigation	Residual Effect	Proposed Monitoring
	C	O	D						
							protection so far as practicable.		
Fishing gear interaction with subsea cable	X	✓	X						
Marine Scheme overall				Minor	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Vessel grounding due to reduced under keel clearance	X	✓	X						
Scottish waters				Moderate	Extremely Unlikely	Broadly Acceptable	N/A	Tolerable	N/A
English waters				Moderate	Remote	Tolerable	N/A	Tolerable	N/A
Interference with magnetic compasses	X	✓	X						
Marine Scheme overall				Minor	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	Post-lay compass deviation assessment (if it cannot be demonstrated that MCA deviation requirements can be met)

Table 13.17 Summary of likely significant cumulative environment effects, mitigation and monitoring

Description of Impact	Phase			Severity of Consequence	Frequency of Occurrence	Significance of Effect	Secondary Mitigation	Residual Effect	Proposed Monitoring
	C	O	D						
Increased vessel to vessel collision risk between a third-party vessel and a project vessel	✓	✓	✓						
Marine Scheme overall				Moderate	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Vessel displacement leading to increased vessel to vessel collision risk between third-party vessels	✓	×	✓						
Marine Scheme overall				Moderate	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Reduced access to local ports	✓	×	✓						
Scottish waters				Minor	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
English waters				Minor	Remote	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Reduced access to local ports	×	✓	×	Negligible	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Scottish waters				Negligible	Negligible	Broadly Acceptable	N/A	Broadly Acceptable	N/A
English waters				Negligible	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Anchor interaction with subsea cable	✓	×	×						
Marine Scheme overall				Moderate	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	N/A
Anchor interaction with subsea cable	×	✓	×						
Marine Scheme overall				Minor	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	
Fishing gear interaction with subsea cable	✓	×	×						

Description of Impact	Phase			Severity of Consequence	Frequency of Occurrence	Significance of Effect	Secondary Mitigation	Residual Effect	Proposed Monitoring
	C	O	D						
Marine Scheme overall				Serious	Remote	Tolerable	Reducing of period between surface laying and burial/ protection so far as practicable.	Tolerable	N/A
Fishing gear interaction with subsea cable	×	✓	×						
Marine Scheme overall				Minor	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	
Vessel grounding due to reduced under keel clearance	×	✓	×						
Scottish waters				Moderate	Extremely Unlikely	Broadly Acceptable	N/A	Tolerable	N/A
English waters				Moderate	Remote	Tolerable	N/A	Tolerable	N/A
Interference with magnetic compasses	×	✓	×						
Marine Scheme overall				Minor	Extremely Unlikely	Broadly Acceptable	N/A	Broadly Acceptable	Post-lay compass deviation assessment (if it cannot be demonstrated that MCA deviation requirements can be met)

3.18. References

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