Chapter 13
Shipping and Navigation

ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

rps
A TETRA TECH COMPANY

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ESB
Energy for generations

ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report
Chapter 13: Shipping and Navigation

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EIAR – Chapter 13
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13 SHIPPING AND NAVIGATION

13.1 Introduction

This chapter of the Environmental Impact Assessment Report provides an assessment of the potential impacts of the Oriel Wind Farm Project (hereafter referred to as 'the Project') on shipping and navigation. during the construction, operational and maintenance, and decommissioning phases.

This chapter addresses navigational safety and risk to all vessel types. An assessment of the potential impacts to the undertaking of a marine activity, or the operational effectiveness of marine infrastructure, is considered in chapter 16: Infrastructure, Marine Recreation and Other Users.

This chapter draws upon information contained within appendix 13-1: Navigation Risk Assessment.

The details and competencies of the specialist who prepared this chapter can be found in volume 2A, chapter 1: Introduction.

13.2 Purpose of this chapter

The primary purpose of the EIAR chapter (and accompanying Navigation Risk Assessment (NRA)) is to provide an assessment of the likely direct and indirect significant effects of the Project on shipping and navigation.

Shipping and navigation includes an assessment of potential impacts on cargo vessels, tankers, fishing vessels, recreational vessels, passenger vessels and tug and service vessels. In particular, this EIAR chapter:

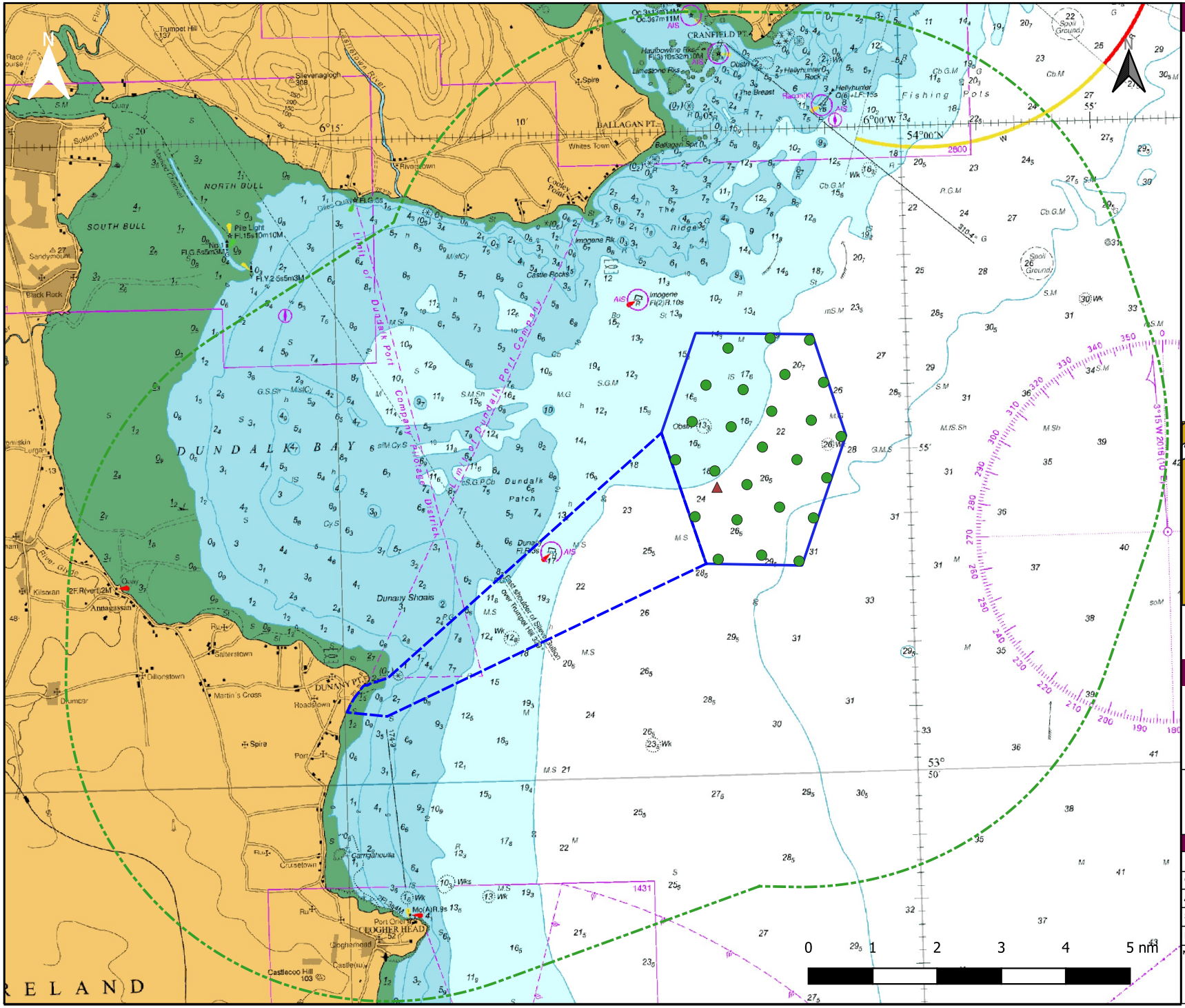
- Presents the existing environmental baseline established from desk studies and consultation for shipping and navigation receptors (section 13.7);
- Identifies any assumptions and limitations encountered in compiling the environmental information (section 13.7.10);
- Presents an assessment of the potential likely significant effects on shipping and navigation arising from the Project (section 13.10), based on the information gathered and the analysis and assessments undertaken. An assessment of potential cumulative impacts is provided in section 13.11 and an assessment of transboundary effects is outlined in section 13.12; and
- Highlights any necessary monitoring (section 13.10.5) and/or measures (see section 13.8.2 and 13.10.4) measures to prevent, minimise, reduce or offset the possible effects identified in the assessment (section 13.10).

13.3 Study area

The Shipping and Navigation Study Area considers vessel traffic within five nautical miles (NM) of the offshore wind farm area and the offshore cable corridor as shown in Figure 13-1.

It is the expert opinion of the author of this chapter that 5 NM is representative to capture all vessel traffic in the area heading to and from Drogheda Port, Carlingford Lough, Port Oriel (Clogherhead) and Dundalk Harbour. This 5 NM study area covers the approaches to these ports, along with the coastal area where the Project may affect vessel routeing. Where necessary and appropriate, reference is made to navigation routes in the wider context.

The Cumulative Shipping and Navigation Study Area is defined as a radius of 20 NM from the Project (see section 13.11). This larger radius allows the wider vessel and port activity in the region to be assessed against identified projects that may have a cumulative effect with the Project.



Legend

- Offshore Cable Corridor
- Offshore Wind Farm Area
- Shipping and Navigation Study Area
- Offshore Sub Station
- Wind Turbine

Client: ORIEL WINDFARM OFFSHORE RENEWABLE ENERGY

Project: **Oriel Wind Farm Project**

Title

Figure 13-1 Shipping and Navigation Study Area

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Issue Details

Drawn:	AF	**Project:** MDR1520B
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Notes

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13.4 Policy context

Planning policy on renewable energy infrastructure is presented in volume 2A, chapter 2: Policy and Legislation. This section presents planning policy that specifically relates to shipping and navigation, which is contained in the Offshore Renewable Energy Development Plan (OREDP) (DECC, 2022), the National Marine Planning Framework (NMPF) (DHLGH, 2021) and additional guidance pertaining to shipping and navigation. The OREDP and NMPF include guidance on what matters are to be considered in the assessment. These are summarised in Table 13-1 and Table 13-2. The NMPF has also highlighted where planning policies are addressed via other activities operating alongside the NMPF. Guidance specific to shipping and navigation is provided in Table 13-3.

In February 2023, the 'OREDP II - National Spatial Strategy for the transition to the Enduring Regime' was published in draft and subject to consultation. The key objectives of OREDP II are to:

- "*Assess the resource potential for ORE in Ireland's maritime area;*
- *Provide an evidence base to facilitate the future identification of Broad Areas of Interest most suitable for the sustainable deployment of ORE in Ireland's maritime area; and*
- *Identify critical gaps in marine data or knowledge and recommend prioritised actions to close these gaps*".

The OREDP II will provide an evidence base to facilitate the future identification of Broad Areas of Interest most suitable for the sustainable deployment of ORE in Ireland's maritime area, to be assessed in greater detail at regional scale. This assessment will subsequently inform the identification of more refined areas as part of the designation process for Designated Maritime Area Plans (DMAP).

When published, the OREDP II will update the original OREDP published in 2014.

Reference has been made to UK policies and guidance where there is an absence of equivalent Irish policy or guidance. The UK policies and guidance have been applied to other OREI developments in the Irish Sea and are considered the best available guidance applicable to the Project.

Table 13-1: Summary of OREDP provisions relevant to shipping and navigation.

Summary of OREDP project-level mitigation measures	How and where considered in the EIAR
Displacement of shipping	
Where feasible site devices away from constraints and areas of high vessel densities.	Shipping and navigation constraints were considered to evaluate the offshore elements of the Project and outline a preferred alternative – namely, avoidance of shipping lanes and giving preference to areas of limited shipping traffic (see volume 2A, chapter 4: Consideration of Alternatives).
Undertake a Navigation Risk Assessment (NRA) which should include a survey of all vessels in the vicinity of the Project.	The NRA is discussed within section 13.9 and is provided in appendix 13-1: Navigation Risk Assessment.
Decreased trade / supply	
Maintain good communications with the relevant ports.	Communications measures included in the Project are set out in Table 13-9. Emergency communications are also outlined in volume 2A, appendix 5-7: Emergency Response Co-operation Plan.
Issue the appropriate notifications during installation and maintenance.	Communications and measures included in the Project are set out in Table 13-9.
Site selection for device arrays to take into account the requirement for continued access to port and harbours.	Evaluation of location options took shipping and navigation constraints into consideration (see volume 2A, chapter 4: Consideration of Alternatives). Vessel traffic is considered in section 13.7.6 of this chapter.

Summary of OREDP project-level mitigation measures	How and where considered in the EIAR
Reduced visibility	
Avoiding areas of high vessel densities and areas constrained by land (e.g. adjacent to the entrances of ports and Lochs).	Shipping and navigation constraints were considered to evaluate the offshore elements of the Project and outline a preferred alternative – namely, avoidance of shipping lanes and giving preference to areas of limited shipping traffic (see volume 2A, chapter 4: Consideration of Alternatives). Displacement of vessels from the offshore wind farm area is also considered in section 13.10.1.
In busy shipping areas, potential effects may be reduced by minimising the period of installation, the number of vessels required and the area occupied during installation would reduce the potential impact on visibility.	The avoidance of shipping lanes and higher density shipping routes was considered during the evaluation of location options as outlined in volume 2A, chapter 4: Consideration of Alternatives.
Any vessels and devices should be lit and marked in accordance with the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) guidelines, in agreement with the Commissioners of Irish Lights.	This is considered in volume 2A, appendix 5-8: Lighting and Marking Plan.
Collision risk	
Avoid constrained areas or areas of high shipping densities and regularly used shipping routes.	The avoidance of shipping lanes and higher density shipping routes was considered during the evaluation of location options as outlined in chapter 4: Consideration of Alternatives. Collision risk is considered within section 13.10 of this chapter and appendix 13-1: Navigation Risk Assessment.
In busy shipping areas, potential effects may be reduced by minimising the period of installation, the number of vessels required and the area occupied during installation.	The avoidance of shipping lanes and higher density shipping routes was considered during the evaluation of location options as outlined in chapter 4: Consideration of Alternatives. Collision risk is considered within section 13.10 of this chapter and appendix 13-1: Navigation Risk Assessment.
Maintain good communications with the relevant ports, and issue the appropriate notifications during installation, maintenance, and decommissioning.	Communications measures included in the Project are set out in Table 13-9. Emergency communications are also outlined in volume 2A, appendix 5-7: Emergency Response Co-operation Plan. Collision risk is considered within section 13.10 of this chapter and in appendix 13-1: Navigation Risk Assessment.
The scale of potential effect on navigation should be assessed as part of the EIA and NRA as outlined above.	This is considered in section 13.10 of this chapter and in appendix 13-1: Navigation Risk Assessment

Table 13-2: Summary of NMPF provisions and key issues relevant to shipping and navigation.

Summary of NMPF provision	How and where considered in the EIAR
Energy – Offshore Renewables policies	
Offshore renewable energy projects can have a wide range of positive and adverse impacts for other activities or marine sectors. For example, offshore wind developments may be competing for space with traditional sea users, such as fisheries, navigational routes or leisure sailing.	Shipping and navigation constraints were considered to evaluate the offshore elements of the Project and outline a preferred alternative – namely, avoidance of shipping lanes and giving preference to areas of limited shipping traffic (see volume 2A, chapter 4: Consideration of Alternatives). Displacement of vessels from the offshore wind farm area is also considered within section 13.9.
Our ports will also play a crucial role in facilitating the necessary development of both offshore renewable generation and grid infrastructure, requiring investment to	Port facilities will be required for assembly of the Project components. An onshore operations and maintenance (O&M) base will be required to support the operating wind

Summary of NMPF provision	How and where considered in the EIAR
handle plant, equipment and cabling, and the associated shipping during the construction, operation, and maintenance phases of future projects.	farm after construction. The O&M base will be local to the Project in County Louth or County Down. Further information is provided in appendix 13-1: Navigation Risk Assessment.
Energy – Transmission policies	
In the construction of electricity interconnectors offshore, care must be taken to limit potential disturbances to the marine environment, marine ecology, marine life, shipping routes and other activities including fishing.	Measures to reduce the impact of the cables are outlined in Table 13-9.
Ports, Harbours and Shipping policies	
Ports and shipping are the country's trading lifeline. Safeguarding access to ports, harbours and navigation channels is vital to the national economy. The safety and security of shipping and ports must be taken into consideration when considering all other applications for activity or development in the vicinity of ports or shipping channels. Consideration within proposals of features of importance in areas of shipping as well as within port and harbour jurisdictions can be enhanced through reference to the most up to date nautical charts.	The potential effects on shipping and ports are considered within appendix 13-1: Navigation Risk Assessment.
Marine development should not be permitted where it would restrict access to, or future expansion of, commercial ports or the development of new ports, which may be needed in the future. Additionally, ports should be designated consultees for any proposed developments in the maritime area, including proposals that may have an impact upon the maritime area or its use, to ensure early engagement.	The potential effects on ports are considered within appendix 13-1: Navigation Risk Assessment. Table 13-4 provides information on consultation activities and issues raised.
Freight volumes are expected to continue to increase over the coming decades, while vessel sizes are also predicted to grow and vessel types set to further diversify. In this context accessibility, capacity and navigational safety will be significant challenges for all players and port development will trend seawards. Allocation of sufficient space for future growth, the strategic identification of long-term port locations and development of existing ports all need to be factored into long term economic and spatial planning (terrestrial and marine).	Potential changes in vessel traffic from the Project are discussed in section 13.7.9.
The protection of the use of the shortest routes to ports thus the most economic route with the least carbon footprint	Shipping and navigation constraints were considered to evaluate the offshore elements of the Project and outline a preferred alternative – namely, avoidance of shipping lanes and giving preference to areas of limited shipping traffic (see volume 2A, chapter 4: Consideration of Alternatives) thus minimising impacts on existing routes. The effect of increased transit distance for commercial vessels due to displacement from the offshore wind farm area is also considered in Table 13-8.
Supporting the tourist, leisure and fishing sectors, promoting safety at sea, and encouraging safe development of coastal infrastructure and commercial activity, such as offshore exploration and renewable energy.	During construction and major maintenance activities, there will be regular liaison with local sailing associations and other local stakeholders – see Table 13-4. Potential impacts on tourism are considered in volume 2C, chapter 18: Population and Human Health, and coastal infrastructure and marine recreation are considered in chapter 16: Infrastructure, Marine Recreation and Other Users.
All marine sectors rely on ports and shipping activities. Similarly, all other sectors will impact to some extent on the sea space available for safe and efficient navigation. The primary interactions are likely to be from aquaculture, renewable energy and protected areas. Consultation and	An overview of the consultation responses relevant to the shipping and navigation assessment is provided in section 13.5. All Project consultation is summarised in volume 2A, chapter 6: Consultation.

Summary of NMPF provision	How and where considered in the EIAR
effective communication across sectors and agencies will be critical to beneficial coexistence.	
Safety at Sea Policies	
Assessment of development proposals should consider the protection and safety of key shipping routes as a priority. In accordance with the regulations for the prevention of collisions, key considerations include: allowing for sufficient sea room for safe vessel manoeuvring and collision avoidance, avoiding choke points, and not restricting availability of deep water for deep draft vessels.	This is considered within section 13.9 and addressed within appendix 13-1: Navigation Risk Assessment.
The International Association of Lighthouse Authorities (IALA) Risk Management Toolbox approach can quantify forward planning risks for safety of navigation and incorporate these into the planning process	The IMO Formal Safety Assessment methodology (IMO, 2018) was used to inform the NRA (appendix 13-1: Navigation Risk Assessment).
The potential for proposals to interfere with ship radar detection systems should also be assessed.	Effects on radar are considered in appendix 13-1: Navigation Risk Assessment.
The location of fishing devices such as pots is also a concern for the safe navigation of small craft.	Fishing grounds were identified through desktop study and consultation - see section 13.5. Impacts on the safe navigation of vessels as a result of the Project are considered within section 13.10.
The key marine planning issue for the IRCG is the Maritime Emergency Response (Search and Rescue (SAR), Maritime Casualty and Pollution Response). Ongoing risk assessments are performed to ensure that the SAR organisation, response facilities and deployment of resources are adequate to meet demands	Impacts on SAR provision are assessed in section 5.4 of Appendix 13-1: Navigation Risk Assessment.

Table 13-3: Summary of other policy framework provisions and guidance relevant to shipping and navigation.

Summary of relevant policy framework	How and where considered in the EIAR
DECC (formerly DCCAE) Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects	
Provides guidance assisting developers in preparing Environmental Impact Assessment Reports (EIAR) and outlines the relevant guidance for assessing shipping and navigation within EIAR.	The guidance documents referenced within this guidance relevant to shipping and navigation have been considered within this table.
Marine Guidance Note (MGN) 654[1] (M+F) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (see also section 13.4.1)	
This MGN highlights issues to be considered when assessing the impact on navigational safety and emergency response arising from Offshore Renewable Energy Installations (OREI), including traffic surveys, consultation, structure layout, collision avoidance, impacts on communications/ radar/ positioning systems and hydrography.	Vessel traffic is considered within section 13.7.6. A summary of consultation is provided in section 13.5 Potential impacts are considered within section 13.10.
Maritime and Coastguard Agency (MCA) Methodology for Assessing Marine Navigational Safety & Emergency Response Risks of OREIs	
This document is incorporated into MGN 654 as Annex 1 and should be read in conjunction with MGN 654. Its purpose is to be used as guidance for developers in preparing their navigation risk and emergency response assessment and includes a suggested template for preparing NRAs for offshore wind farms.	The methodology used within this EIAR chapter and appendix 13-1: Navigation Risk Assessment considers the guidance within this document.

[1] Marine Guidance Note (MGN) 654 replaced MGN 543 in April 2021.

Summary of relevant policy framework	How and where considered in the EIAR
MGN 372 "Guidance to Mariners Operating in the Vicinity of UK OREIs".	
Issues to be considered when planning and undertaking voyages near OREI off the coast.	Potential impacts, including collisions and impacts on communications, are considered within section 13.10.
International Association of Marine Aids to Navigation and Lighthouse Authorities 0-139 the Marking of Man-Made Offshore Structures.	
Guidance to national authorities on the marking of offshore structures including wind farms.	Risk controls relating to aids to navigation (marking and lighting) are outlined in section 13.8.2 and appendix 13-1: Navigation Risk Assessment.
International Maritime Organisation (IMO) Formal Safety Assessment.	
Process for undertaking marine navigation risk assessments.	Encompassed within appendix 13-1: Navigation Risk Assessment.
Royal Yachting Association (RYA) Position on Offshore Energy Developments.	
Outlines recreational boating concerns for offshore renewable energy developments.	Potential impacts on recreational users are considered in section 13.10.
European Boating Association (EBA) Position Statement, Offshore Wind Farms.	
The EBA will: • Support its members in their dealings with their respective national governments regarding the development of offshore wind energy installations to secure navigational safety and to ensure that recreational boating interests are not adversely affected; • Object to the establishment of operational safety zones around individual turbines or entire wind farms unless it can be demonstrated that they are necessary and that their enforcement will increase the safety of mariners navigating within the vicinity of the development; • Support the guidance provided by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) in relation to marking and lighting and will support its members in their dealings with their respective national governments to identify site specific issues that may occur; and • Encourage publishers of media used by recreational boaters for passage planning to include details of any restrictions relating to wind farms.	Potential impacts on recreational users are considered in section 13.10.

13.4.1 MCA Marine Guidance Note (MGN) 654

The Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects (DCCAE, 2017) refers to the DTI and MCA guidance "Methodology for Assessing the Marine Navigational Safety Risks of Offshore Wind Farms (2005)" which was replaced by the MCA's Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of OREIs in 2013. This guidance is Annex 1 of UK MCA guidance – MGN 654 (M+F)[2] (MCA, 2021a).

MGN 654 (M+F) (MCA, 2021b) is the primary guidance relevant to this assessment. MGN 654 (M+F) highlights issues that need to be taken into consideration when assessing the impact on navigational safety and emergency responses caused by offshore renewable energy installation. MGN 654 (M+F) should be considered in conjunction with:

- MCA MGN 372 Offshore Renewable Energy Installations (OREIs) – Guidance to Mariners Operating in the Vicinity of UK OREIs (MCA, 2022); and

[2] Marine Guidance Note (MGN) 654 replaced MGN 543 in April 2021.

- MGN 654 Annex 1 Methodology for assessing marine navigational safety & emergency response risks of OREIs (MCA, 2021a).

Therefore, for the purposes of the NRA (appendix 13-1: Navigation Risk Assessment) and this chapter, MGN 654 has been followed, as also agreed with the Marine Survey Office (MSO) during consultation (see Table 13-4).

Unlike other policy documents in this section, MGN 654 in its entirety is relevant to the NRA and this chapter.

13.4.2 Guidance on Marine Navigational Safety & Emergency Response Risk (Draft)

The Department of Transport have prepared guidance on navigation risk and emergency response assessments and is currently in draft and undergoing consultation with the relevant stakeholders (as of February 2024). The Applicant will consider the final guidance once published and ensure that the Emergency Response Co-operation Plan (appendix 5-7 in volume 2A) complies with the guidance.

13.4.3 Convention on the International Regulations for Preventing Collisions at Sea

The Convention on the International Regulations for Preventing Collisions at Sea (COLREGs, 1972) specifies how vessels should behave when encountering each other at sea. The regulations include a total of 41 rules divided into six sections that articulate which vessels have right or way and which vessels should give way – they outline how the bridge team onboard a vessel navigate and interact with other traffic. The six sections are:

- Part A – General – defines where (e.g. at sea and all waters connected to the high seas) and to what the rules apply;
- Part B - Steering and Sailing:
    - Section I - Conduct of vessels in any condition of visibility;
    - Section II - Conduct of vessels in sight of one another; and
    - Section III - Conduct of vessels in restricted visibility– conduct of vessels including actions to avoid collisions.
- Part C - Lights and Shapes – describes the lights and shapes vessels should display so that other vessels will be able to identify any limitation on manoeuvrability;
- Part D - Sound and Light signals – describes the sound signals vessels should both when manoeuvring and during restricted visibility;
- Part E – Exemptions – identifies vessels which are exempt from the regulations; and
- Part F - Verification of compliance with the provisions of the Convention.

The regulation also includes four Annexes containing technical requirements concerning:

- Lights and shapes and their positioning;
- Sound signalling appliances;
- Additional signals for fishing vessels when operating in close proximity; and
- International distress signals.

13.5 Consultation

Table 13-4 summarises the issues identified during consultation activities undertaken to date, which are relevant to shipping and navigation, together with how these issues have been considered in the preparation of this EIAR chapter. A number of organisations were contacted, including the Irish Coast Guard, Marine Survey Office, Commissioners of Irish Lights, as well as lough commissioners, port companies, recreational sailing / cruising stakeholders and fisheries stakeholders. Details of all organisations contacted between 2019 and 2024 are provided in chapter 6: Consultation (volume 2A)

Table 13-4: Summary of key consultation issues raised during consultation activities undertaken for the Project relevant to shipping and navigation.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
September 2019	Clogher Head Royal National Lifeboat Institution (RNLI) Station - meeting	Confirmed that the AIS fishing boat plots was a fair representation. Fishing activities included: Dublin prawns; razors; lobsters; and crab. The station has an average of 20-25 call outs per year. Several call outs have recently involved fishing boats suffering with mechanical issues. The general consensus was that the Project would not hamper existing lifesaving duties.	Information used to inform the baseline environment (see section 13.7).
September 2019	Dundalk Pilot - meeting	In 2018 Dundalk harbour handled 53 vessels (106 movements) up to a maximum length of 120 m and approximately 5 m draught. Cargoes include scrap, timber, fertilizer and bulk. There are no recreational or pleasure craft operating in or out of the harbour. Fishing is primarily cockle day boats operating inside port limits. There are three lobster boats operating out towards Imogene navigation buoy. Considered that the AIS vessel track plots are a fair representation of vessel traffic activity in Dundalk Bay. Confirmed that there is no vessel activity/anchoring in the Dunany Point area where the offshore cable corridor overlaps with the Dundalk Competent Harbour Authority/Statutory Harbour Authority areas.	Information used to inform the baseline environment (see section 13.7).
September 2019	Dundalk Port, care of Dublin Port Company - meeting	Explained that the Dublin Harbour Master also has statutory responsibilities for Dundalk Harbour. Confirmed that the vessel traffic plots appeared to be representative of current commercial marine traffic in the Dundalk Bay area. Dundalk handles on average one vessel per week; however trade was currently declining.	Information used to inform the baseline environment (see section 13.7).

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
		No navigational safety issues were raised regarding vessels entering and leaving Dundalk with the Project in place.	
September 2019	Drogheda Port - meeting	The offshore wind farm area is outside of the port jurisdiction and as such no navigational concerns were raised. Raised potential for commercial impact arising from vessels diverting around the area thereby increasing the distance and possibly missing a tidal window at Drogheda. Advised consideration of a Traffic Separation Scheme adjacent to the offshore wind farm area. Discussed potential diversion of vessels around the offshore wind farm area. Accepted that the diversion and associated possible delays would be minor, as were the absolute number of vessels. Noted that Drogheda Port are proposing to develop a new harbour at Braymore Point (south of Drogheda).	Impacts on commercial vessels are addressed in section 13.10. Specifically, commercial vessels are considered within the following impacts: • Presence of project-related vessels transiting to and from their operational base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision. • Presence of Project devices may lead to vessel-to-structure contact. • Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear.
September 2019	Irish Sailing Association - email	Advised that Irish Sailing supports the EBA position statement on wind farms. Advised on data sources for the risk assessment including shipping lanes, tonnage, frequency, speed etc. and advised to consider all likely activities in the area (windsurfing, motor boating/powerboating, sailing racing and cruising). Advocates anti-collision mitigation (sound, light, fluorescent paint etc). Advised that the Carlingford Sailing Club membership for 2019 stands at 216 members.	Information on data sources used is provided in section 13.6 and data limitations are addressed in section 13.7.10. Potential impacts on recreational users are considered in section 13.10. Specifically, recreational vessels are considered within the following impacts: • Presence of project-related vessels transiting to and from their operational base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision. • Presence of Project devices may lead to vessel-to-structure contact. • Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear.
September 2019	Irish Coast Guard - meeting	The role of the IRCG includes: Search and Rescue (SAR); pollution and ship casualty response and obligations under Safety of Life at Sea (SOLAS). The IRCG has three Rescue Coordination Centres: Malin; Valentia and Dublin as well as helicopter bases. A new SAR plan has recently been issued. The IRGC would be responsible for ensuring that adequate emergency plans were in place particularly for the use of helicopter involvement in SAR	SAR is addressed in sections 13.7.5 and 13.10. Compliance with The International Convention for the Safety of Life at Sea (SOLAS) for SAR is addressed in Table 13-9. Addressed by providing an ERCoP for the Project.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
		operations. Discussed provision of an Emergency Response Co-operation Plan (ERCoP) for the Project. Warrenpoint Port is anticipating an upturn of vessel movements following the UK's departure from the European Union. Guidance was sought on lines of orientation of the wind turbine generators (WTGs). IRCG considered that although a linear layout would be preferable, they were unaware of any regulatory requirement.	
September 2019	Marine Survey Office and Commissioners of Irish Lights - telecon	The MSO will consider the impact of the Project on: the safety of navigation; restriction of navigation rights; vessel traffic displacement; and limiting room of vessel manoeuvrability. The CIL will be responsible for approving the Project navigational aids and lighting plans and would promulgate this information to the UK Hydrographic Office (UKHO) for updating navigation charts. The MSO highlighted that future traffic trends may be influenced by the UK's departure from the European Union and other future port developments. The potential for temporary safety zones during construction was identified. Commissioners of Irish Light (CIL) has no statutory function regarding safety zones, which are a matter for the Coastal State under the United Nations Convention on the Law of the Sea (UNCLOS) Paragraph 60(4) and IMO Resolution A.671(16). There are 2 x navigation buoys to the west of the offshore wind farm area: Imogene and Dunany red buoys. The distance between the offshore wind farm area and the Imogene buoy is 1 NM. CIL noted that both buoys mark shoal areas for larger commercial vessels in the vicinity of Dundalk Bay. Fishing and leisure users may safely navigate inside these marks in practice. CIL guidance on the layout from a navigational perspective is to seek to avoid choke points, especially to the north side in the vicinity of Imogene lateral mark.	It was agreed that the Automatic Identification System (AIS) traffic analysis presents a relatively light traffic profile.
March 2021	Dunany Point Lobster and Crab - questionnaire	Operate throughout the year in Dundalk Bay in the vicinity of the offshore wind farm area and	Impacts on fishing vessels are addressed in section 3.6 of appendix 13-1:

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
		offshore cable corridor. 14 potting and kreel boats up to 10 m with 2-man crews operating during daylight hours only and do not have AIS fitted. Land in Clogherhead, Dundalk, Greenore, Donegal Concerns relate to: • Restrictions to vessels during construction, piling and drilling activities; • Fishing numbers on all species down after surveys; • Concerns with ongoing O&M activities; • Concerns with shipping route over fishing grounds as result of deviation; and • Small deviation of vessels due to array.	Navigation Risk Assessment and section 13.10 of this EIAR chapter. Specifically, fishing vessels are considered within the following impacts: • Presence of Project-related vessels transiting to and from their operational base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision; • Presence of Project devices may lead to vessel-to-structure contact; and • Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear.
March 2021	Northern Ireland Fish Producers Organisation (NIFPO) - meeting	The 20 members fish all year round, daytime only, single-handed in boats up to 12 m with heaviest effort between May to September and between mid-November to mid-December. Potting main activity with some trawling for *Nephrops*. Pots are deployed within the offshore cable corridor. Some boats may carry AIS. Vessels operate out of Kilkeel and Ardglass. Long been anecdotal evidence of Electrical and Magnetic Fields (EMF) and vibration scaring off shellfish. Main concern is that the target species will no longer be there to target. Seafish report on EMF and vibration for the main evidence base for this and is of real concern to the fishing industry.	Section 5.6.7 of appendix 13-1: Navigation Risk Assessment considers the effects of electromagnetic interference from cables and concludes that it will be minimal given the depth of water within the offshore wind farm area and along much of the offshore cable corridor. Potential impacts to fisheries and target species are not relevant to this chapter and are considered in chapter 12: Commercial Fisheries. EMF is considered in chapter 12: Commercial Fisheries.
March 2021	Commissioners of Irish Lights (CIL) - letter, email and online meeting	The WTG layout has now increased the distance to the Imogene buoy from 1 NM to approximately 1.6 NM. There remains a risk with vessels having to navigate northwest towards shallower waters. However, vessel traffic would remain southeast of the buoy rather than travel via shallower water to the northwest. Furthermore, there only a very few commercial vessels transiting in a coastwise direction (approximately one per week). The offshore wind farm may lead to some commercial vessels having to divert towards shallower water if they elect to transit the	Effects on commercial vessels are considered in section 13.10. Cumulative impacts are assessed in section 13.11.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
		inshore route. Concerns were also noted regarding vessels transiting the inshore route, encountering vessels at anchor to the north of the offshore wind farm area near the approaches to Carlingford Lough. CIL confirmed though that the offshore route would be more attractive to commercial vessels on coastwise transit, however there must be consideration for vessels using the inner route. CIL as Lighthouse Authority responsible for Aids to Navigation (AtoN) would undertake an assessment on the need to relocate/change the location of the Imogene Buoy, based on the "Volume of Traffic" and "Degree of Risk" of vessels using the inshore passage. Consideration of cumulative impacts needs to be undertaken particularly with other offshore wind farm projects to the northeast and southeast. Tidal effects were identified as minimal within the NRA and Shipping and Navigation Study Area. However, it was noted that source data, taken from the Admiralty Chart is from some distance away.	
March 2021	Dundalk Port Company and Pilot - online meeting	Concerns around vessel emergency anchoring within offshore wind farm area or offshore cable corridor and potential drag and damage cable. No significant concerns raised by Harbour Master or pilot. Harbour Master and pilot noted that the offshore wind farm area layout has moved away from NW corner and Imogene buoy. This gives more space for vessels transiting from north into Dundalk Harbour and was seen as positive.	The potential for snagging and damage to anchors and/or fishing gear is addressed in section 13.10. Specifically, potential for snagging is considered within: • Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear. A Lighting and Marking Plan is included in volume 2A, appendix 5-9 Lighting and Marking Plan. It was confirmed that there is and would be continued engagement with CIL and MSO on navigation marking requirements but expect navigation lighting at corners of the offshore wind farm area.
March 2021	Irish Coast Guard - letter and email	No further observations or comment.	n/a
March 2021	Irish Sailing - letter and email	Response from Commodore Carlingford Sailing Club: 'The response to Oriel Wind Farm is fine, it covers all aspects of their proposal that would impact on our interactions, if any'.	No issues raised.
March 2021	Marine Survey Office - letter and email	No further comments.	n/a

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
March 2021	Skerries Sailing Club - meeting	Meeting held with Commodore and club committee members. Extent and location of development was explained in detail. Club has occasional cruises both organised and informal along the coast up to Carlingford. Issues raised included: Exclusion zones for offshore wind farm. It was explained that 500 m safety zones would only be sought during construction and maintenance at other times no exclusion zone would apply. Risk for anchoring in area. It was explained that all cables would be buried or protected by rock armour. Navigation markings. It was explained that the Project would be guided by the requirements of CIL and IALA. Air draft. It was confirmed that a minimum air draft of 22 m above MHWS would be in place. Vessel displacement. Concern was raised that larger cargo vessels transiting into ports could be diverted by the offshore wind farm area into more coastal routes with an increased risk of collision with recreational vessels.	All issues raised are considered in section 13.10. 500 m safety zones will only be sought during construction and maintenance at other times no exclusion zone would apply. All cables will be buried or protected by rock armour. The requirements for navigation markings will be guided by the CIL and IALA. A minimum air draft of 22 m above HWS will be in place. The relatively low number of cargo vessel movements and the space for transiting into Dundalk Harbour or Warrenpoint will reduce the effects of vessel displacement.
November 2022	Irish Coast Guard - meeting	Meeting held to provide an update to the Project and results of NRA and to agree requirements for Marine Safety Management System. An Emergency Response Plan should be developed following the requirements of the UK's Emergency Response Co-operation Plan (ERCoP). Guidance is being developed for the emergency response requirements and is due to be published in 2023.	An outline Emergency Response Plan has been provided in volume 2A, appendix 5-7: Emergency Response Co-operation Plan
November 2022	Commissioners of Irish Lights - meeting	Meeting held to provide an update to the project and results of NRA and to agree requirements for marine lighting and marking and Marine Safety Management System.	A Lighting and Marking Plan has been prepared and is provided in volume 2A, Appendix 5-8: Lighting and Marking Plan.
February 2023	Marine Survey Office - meeting	Meeting held to confirm the results of the vessel traffic data validation exercise and provide an update on the status of the Project. It was agreed that there were no significant differences to vessel traffic quantity or patterns which would affect the results of the NRA.	No issues raised

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
January / February 2023	Members of the public during public consultation	Query on burial depth of offshore cabling	Cables will be buried at a minimum depth of 0.5 m where burial is possible; and cable protection used otherwise. Cable burial will be informed by a cable burial risk assessment in line with best practice (see Table 13-9). The potential impacts of project devices and cables on transiting vessels (snagging and damage) is assessed in section 13.10.3.
October 2023	Isle of Man, Transboundary consultation	As an island nation, any significant risk of interference with marine navigation is of concern to the TSC with regard to transport to and from the island, and the shipping lanes in our Territorial waters which are used to connect the UK and Ireland. These are strategic, lifeline routes that the Island depends on and it is essential that these are not impacted upon as part of these proposals. The economy of the Island is highly reliant on the regular, safe shipping for its goods, and any deviations from well established timetables and routes would not support the Island's business community relying on daily deliveries via the Isle of Man Steam Packet Company. It would appear from the proposed position of Oriel that there shouldn't be any impact on the shipping routes as operated by the Isle of Man Steam Packet Company however the TSC recommends liaising directly with them to confirm.	The Isle of Man Steam Packet Company operates routes to Belfast and Dublin from Douglas. These routes mean that the vessels transit at a significant distance from the Project (>35nm) and so there is not expected to be any impact on the ferry routes. The vessel traffic profile for the Shipping and Navigation Study Area is presented in Section 13.7.6.
February 2024	Irish Coast Guard - meeting	IRCG referred to new guidance and requirement for an oil spill plan to be included in the ERCoP. Also IRCG confirmed UK guidance is best to refer to until new guidance is published in Ireland. IRCG queried impacts on VHS. IRCG queried SAR corridors and distance between turbines.	The ERCoP included in appendix 5-7 (volume 2A) and the Marine Pollution Contingency Plan (see appendix 5-3: Environmental Management Plan) sets out controls in the event of an oil spill. Potential impacts on VHF are considered in appendix 13-1: Navigation Risk Assessment. The SAR access lanes satisfy the width required by MGN 543 to facilitate SAR asset access. This measure is from industry best practice and UK guidance.

13.6 Methodology to inform the baseline

13.6.1 Desktop study

Information within the Shipping and Navigation Study Area was collected through a detailed desktop review of existing studies and datasets. The key sources (i.e. date and reports) used to inform the baseline characterisation of the Shipping and Navigation Study Area are summarised in Table 13-5 below. These sources provide the most up-to-date data for this assessment.

Table 13-5: Summary of key desktop sources.

Title	Source	Year	Author
A Coastal Atlas of Recreational Boating in Ireland	Irish Cruising Club (ICC)	2018	ICC
Admiralty Chart: No:44 Nose of Howth to Ballyquintin Point	United Kingdom Hydrographic Office (UKHO)	1978 (updated to 2019)	UKHO
No 1411: Irish Sea Western Part	UKHO	2017 (updated to 2021)	UKHO
Q6043 Practice and Exercise Area (PEXA)	UKHO	2013	UKHO
Admiralty Sailing Directions - NP40 Irish Coast Pilot	UKHO	2016	UKHO
AIS data	Marine Traffic Research (www.marinetraffic.com)	January/July 2019 January/July 2022	Marine Traffic Research
NP 256 Irish Sea/Bristol Channel Tidal Stream Atlas	UKHO	1992	UKHO
UK Coastal Atlas of Recreational Boating	Royal Yachting Association (RYA)	September 2019	RYA
Information collected through consultation	Oriel consultation process (see volume 2A, chapter 6: Consultation and section 13.5)	Sept 2019 – Feb 2023	Oriel Windfarm Limited, RPS
Historical incident data	RNLI	2008-2020	

13.6.2 Site-specific surveys

Existing Automatic Identification System (AIS) survey data and stakeholder consultation was used to inform the assessment. No vessel-based radar site-specific surveys have been undertaken as it is considered that the existing AIS dataset is sufficient to inform the NRA and the assessment on shipping and navigation for this EIAR. It was confirmed during consultation that the vessel traffic profile provided by the AIS data was representative of the vessel traffic in the Shipping and Navigation Study Area.

13.7 Baseline environment

This section summarises the baseline characterisation resulting from the desktop studies. Further detail is provided in appendix 13-1: navigation risk assessment.

13.7.1 Coastal features and bathymetry

Between Dublin Bay and the entrance to Strangford Lough the hinterland is generally low-lying or of moderate elevation, except for a stretch of 20 NM between Dundalk Bay and Dundrum Bay where the coast is backed by the mountains of the Cooley Peninsula and the Mourne Mountains.

Within the offshore wind farm area the minimum charted water depth is 15 m and the maximum water depth is 33 m at Lowest Astronomical Tide (LAT). The offshore cable corridor has decreasing charted water depths ranging from approximately 25.5 m at the offshore wind farm area southwestern boundary to drying out close to Dunany Point.

13.7.2 Metocean conditions

Metocean conditions of the Shipping and Navigation Study Area are considered when determining the likelihood of occurrence of a hazard or impact. Metocean conditions are reviewed and inform the assessment where they are considered material to a hazard or impact.

The climate on the east coast of Ireland and in the Irish Sea is mild, equable and humid. The summers are usually cloudy and wet, and the winters are windy with frequent rain. Snow is rare. The annual rainfall is generally heavy and well-distributed. Although winds from any direction may be expected in any month, the

winds are usually from the southwest and west, and occasionally from the northwest. Gales (Force 8 on the Beaufort wind scale, >34 kts) may occur in any month and are common from October to March.

There is little, if any, current in the northwest Irish Sea; however, there is the possibility of a west-going surface current which is believed to set across the Irish Sea from Liverpool Bay during strong and persistent east winds. Tidal streams off the coast in the vicinity of the offshore wind farm area are generally weak (less than 1 kt) and there is an area of permanently slack water between the latitudes of Drogheda and Carlingford Lough.

The Project is located in an area that is not highly exposed, nor is it located within a region known for adverse sea states or poor visibility due to fog above those that would normally be expected.

The metocean conditions within the Shipping and Navigation Study Area are therefore not considered to greatly affect the assessment of the potential impacts considered within this chapter. Metocean conditions will be discussed in further detail where they are considered to be material to the impact being assessed.

Most relevant to this assessment is the consideration that smaller vessels would navigate further inshore during adverse weather conditions.

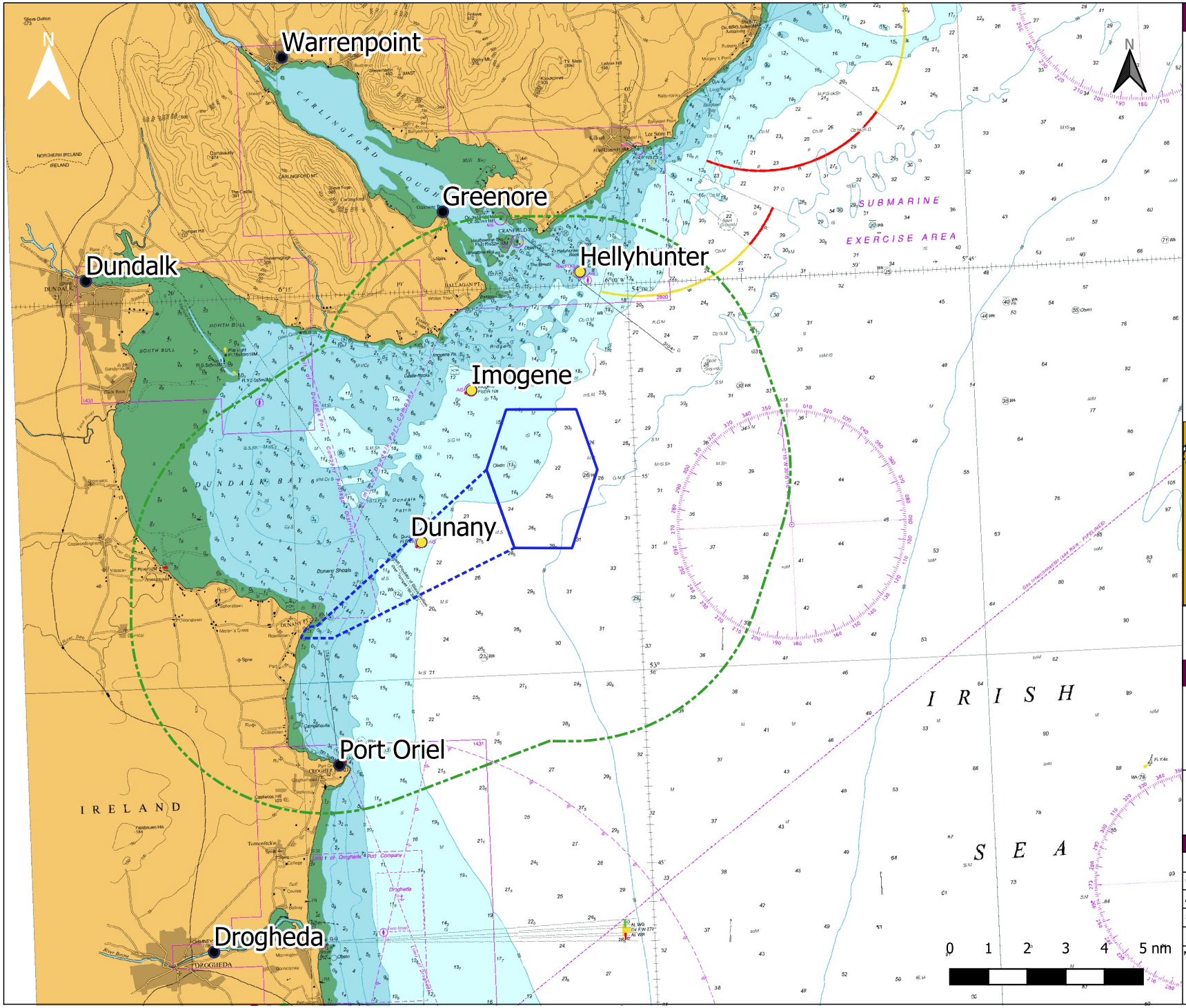
13.7.3 Local ports and harbours

The commercial ports and harbours at Drogheda, Dundalk, Port Oriel (Clogherhead) and Greenore in Ireland, and Warrenpoint at the head of Carlingford Lough in Northern Ireland, are the main ports in the vicinity of the Shipping and Navigation Study Area. In addition, there are several fishing harbours and inlets which are visited by coastal trading vessels and are suitable for small craft. Ports and harbour locations are shown in Figure 13-2.

A brief synopsis of the principal ports and harbours is provided below in Table 13-6.

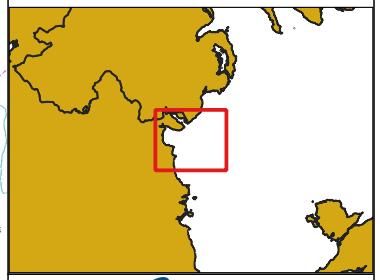
Table 13-6: Local ports and harbours.

Port/Harbour	Description
Port of Warrenpoint	Situated at the mouth of the Newry River at the head of Carlingford Lough. The port has seven berths with a total quay length of 750 m. Principal trades are: Seatruck Ferries regular Roll on – Roll Off (Ro-Ro) service; Cardiff Container Line regular container service; and dry cargoes including timber and general building materials. The port has floating pontoons and cranes to facilitate smaller survey and O&M vessels.
Port of Dundalk	Situated on the Castletown River at the head of Dundalk Bay. Ships of 3,500 deadweight tonnes (dwt) and 120 m length overall (LOA) can be handled. Main cargo inputs are plasterboard, feedstuff, oil, coal, timber and steel. Main exports are scrap metal and turf.
Greenore Port	Privately owned port at the eastern end of the Carlingford Peninsula. It has three berths and can handle vessels of 40,000 gross tonnes. Plans to further develop facilities to support O&M activities for offshore wind projects and long-term plans for Ro-Ro and Load on – Load Off (Lo-Lo) facilities over the coming years.
Kilkeel Harbour	Fishing port lying 3.2 NM northeast of Cranfield Point. The harbour has facilities for fishing vessels and affords shelter for small craft. An inshore lifeboat is maintained.
Port of Drogheda	Situated 4.5 NM upstream from the mouth of the River Boyne. A commercial state port handling over 1 million tonnes of cargo annually. Imports include containers, paper, steel, timber, fertiliser, grains, petroleum, and liquefied petroleum gas. Exports include containers, magnesite, zinc concentrate and timber.
Port Oriel at Clogherhead	Fishing harbour located near Clogherhead in County Louth.



Legend

- Offshore Cable Corridor
- Offshore Wind Farm Area
- Shipping and Navigation Study Area
- Ports and Harbours
- Buoys



Client: ORIEL WINDFARM OFFSHORE RENEWABLE ENERGY

Project: **Oriel Wind Farm Project**

Title

Figure 13-2 Ports and Harbours

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Scale:	1:250,000@ A4	**Projection:**
Date:	29/11/22	IRENET95 / ITM

13.7.4 Existing vessel management

This section outlines the existing management measures for all vessels (except pilotage – see below) within or close to the Shipping and Navigation Study Area, for the ports and harbours described in Section 13.7.3.

Pilotage

The principal ports[3] employ their own licensed pilots. At minor ports where no official pilotage organisation exists, local fishermen or boatmen are usually available to act as pilots. The closest pilot station to the Shipping and Navigation Study Area is situated at the entrance to Carlingford Lough, close to the Hellyhunter buoy. Pilotage is compulsory for all commercial vessels entering the Lough, and Carlingford Lough Pilots Ltd. serve the ports of Warrenpoint and Greenore.

Within the Dundalk pilotage district, if the Dundalk pilot boat is not operational the pilot will utilise Carlingford Lough pilot boat and generally board and land vessels bound to and from Dundalk close to the Hellyhunter buoy.

There is no pilotage within the offshore wind farm area.

Vessel Traffic Services

There are no local port Vessel Traffic Service facilities within close proximity to the Shipping and Navigation Study Area. The primary forms of communication between local ports and vessels are Very High Frequency (VHF) radio and AIS.

Radio Navigational Warnings

The waters within the Shipping and Navigation Study Area lie within NAVAREA 1 which is coordinated by the United Kingdom. NAVAREA warnings are concerned with information which ocean-going mariners require for safe navigation including, in particular, failures of important Aids to Navigation (AtoN) as well as information which may necessitate changes to planned navigational routes.

Aids to Navigation

The Commissioners of Irish Lights (CIL) is the responsible authority for the principal lights and buoys on or around the coasts of Ireland. Some minor lights and buoys are the responsibility of local authorities.

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Maritime Buoyage System Region A (red to port) is in use on the coasts and in the harbours within the Shipping and Navigation Study Area. A description of navigation aids is provided in appendix 13-1: Navigation Risk Assessment.

13.7.5 Search and rescue

In Irish coastal waters and their approaches, Search and Rescue (SAR) operations are carried out by ships, aircraft, including helicopters, and by lifeboats. SAR is coordinated between the relevant responsible authorities and organisations in Ireland and Northern Ireland.

SAR in Ireland is the responsibility of the Department of Transport and is controlled by the Irish Maritime Search and Rescue Region (IMSRR) by the Irish Coast Guard (IRCG), a division of the Department. There is an IRCG station at Greenore Port.

In Northern Ireland, HM Coast Guard (HMCG) is responsible for all civil maritime SAR operations in the UK Search and Rescue Region (SRR). The Ministry of Defence provides units to assist casualties on request from HMCG. The Royal Navy provides Explosive Ordnance Disposal Teams to deal with unexploded or suspect ordnance. The Aeronautical Rescue Coordination Centre at Kinloss, Scotland controls the operation of all military SAR air resources within the UK SRR.

[3] Principal and minor ports are classified as per UKHO Admiralty terminology.

The RNLI is a voluntary organisation incorporated by Royal Charter for the purpose of saving lives, promoting safety and providing relief from disaster, primarily at sea and secondly on the inland waters of Ireland, UK, Channel Islands and Isle of Man. The closest RNLI stations to the offshore wind farm area are at Kilkeel Harbour, Clogherhead and Newcastle Harbour.

13.7.6 Overall traffic profile

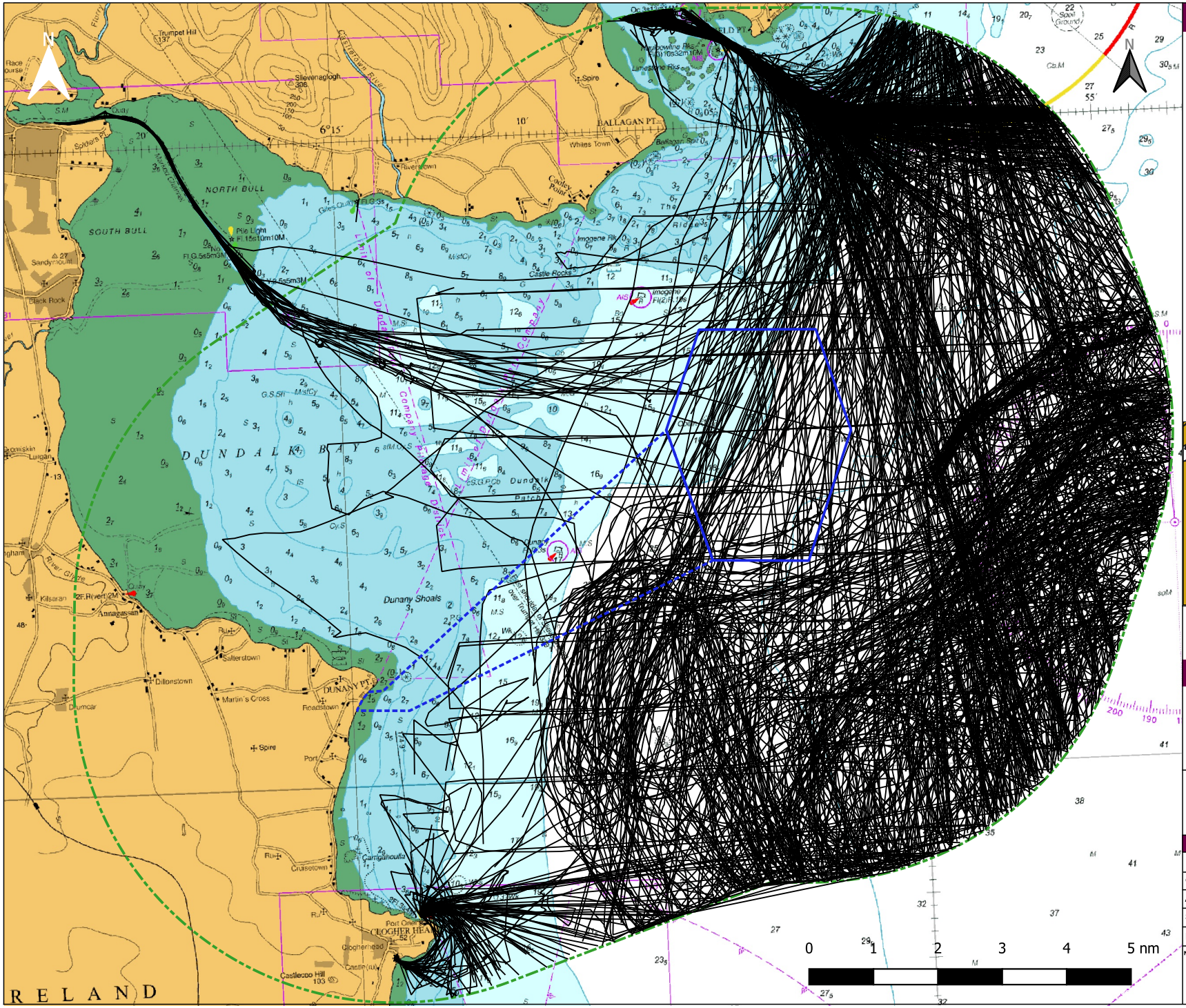
To provide an accurate baseline of vessel traffic in the Shipping and Navigation Study Area, AIS information was utilised for January and July 2019 representative of winter and summer periods. This data has been validated against AIS data obtained for January and July 2022 to identify if there have been any significant changes to vessel traffic activity within the Shipping and Navigation Study Area (see section 13.7.7). AIS data has been supplemented by information provided during the consultation for shipping and navigation (see section 13.4.1).

The tracks of all vessels recorded by AIS during the winter and summer periods are shown in Figure 13-3. Vessel tracks are also broken down by winter (January 2019) and summer (July 2019) in Figure 13-4 and Figure 13-5 respectively. The data show that cargo vessel exposure is similar in winter and summer, but fishing vessels, recreational craft and other vessels show strong seasonal variation, peaking in the summer. The tracks of each vessel type are provided in appendix 13-1: Navigation Risk Assessment.

Table 13-7 summarises vessel traffic by type within the Shipping and Navigation Study Area. Further analysis presented in appendix 13-1: Navigation Risk Assessment shows the prevalence of fishing vessel transits in the Shipping and Navigation Study Area, followed by that of cargo vessels, although cargo vessel transits relate primarily to those bound to/from Carlingford Lough of which the vast majority transit well to the north of the offshore wind farm area.

Table 13-7: Vessel traffic by type (AIS data).

Vessel type	Description
Cargo vessels	The majority of cargo vessel traffic passes clear of the offshore wind farm area. There is evidence of some commercial traffic transiting between Carlingford Lough to and from Drogheda Port.
Tankers	The level of tanker traffic transiting through the Shipping and Navigation Study Area is minimal, with none passing through the offshore wind farm area.
Vessels bound to and from Dundalk	Most vessels pass outside the offshore wind farm area.
Fishing vessels	The data suggests that fishing activity is outside and to the south and southeast of the offshore wind farm area; however, several fishing vessels transit across the Shipping and Navigation Study Area to and from their fishing grounds.
Recreational craft	Recreational craft transit north and south to and from Carlingford Lough through the Shipping and Navigation Study Area. This pattern corresponds with information available from the Irish Sailing Association.
Service vessels	Service craft primarily represents the Carlingford Lough and Dundalk Harbour respective pilot vessel movements. The other movements are attributed to general service vessels.
Other vessel types	Other vessel types are primarily associated with survey vessels engaged in survey work for the Project.



Legend

- Offshore Cable Corridor
- Offshore Wind Farm Area
- Shipping and Navigation Study Area
- Vessel Tracks

Client: ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project: **Oriel Wind Farm Project**

Title

Figure 13-3 AIS Vessel Tracks (January and July 2019)

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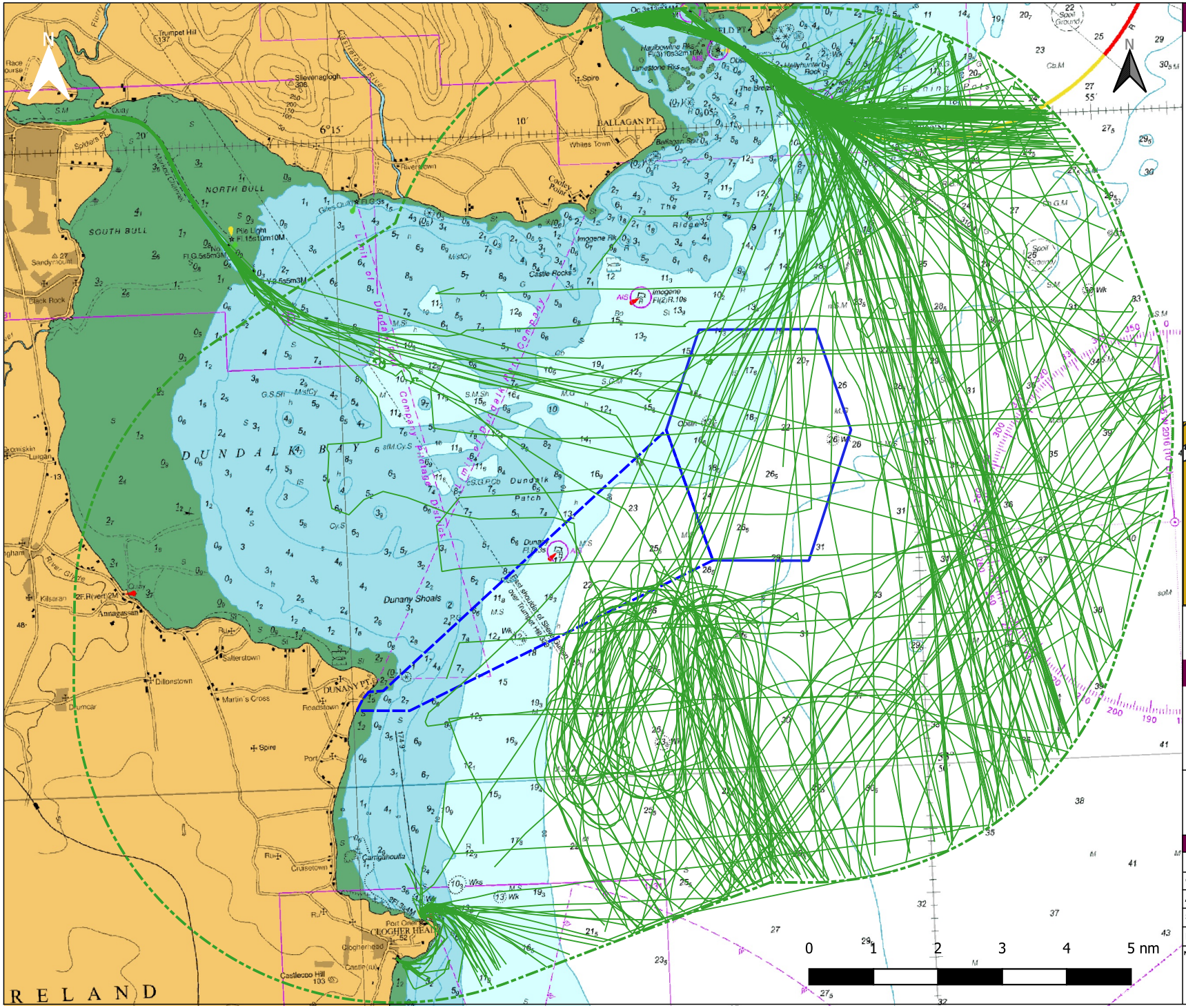

Legend

- Offshore Cable Corridor
- Offshore Wind Farm Area
- Shipping and Navigation Study Area
- Jan 2019 Vessel Tracks

Client: ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project: **Oriel Wind Farm Project**

Title

Figure 13-4 AIS Vessel Tracks (January 2019)

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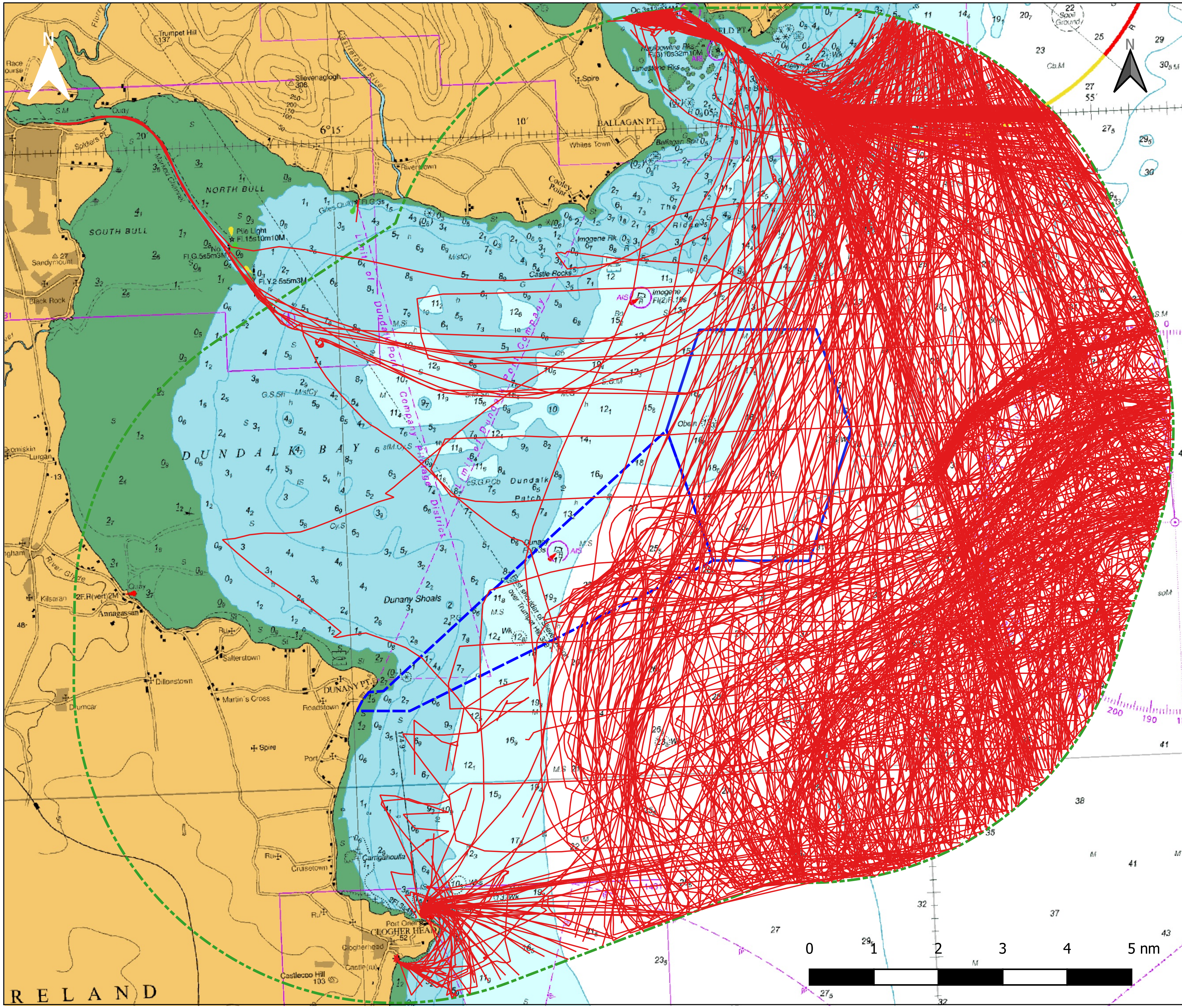

Legend

- Offshore Cable Corridor
- Offshore Wind Farm Area
- Shipping and Navigation Study Area
- July 2019 Vessel Tracks

Client

ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project: **Oriel Wind Farm Project**

Title

Figure 13-5 AIS Vessel Tracks (July 2019)

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Approved:	EJR		MDR1520QG0000D01
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13.7.7 AIS data comparison

The tracks of all vessels recorded by AIS during the winter and summer periods are shown in Figure 13-6 for 2022. Vessel tracks are also broken down by winter (January 2022) and summer (July 2022) in Figure 13-7 and Figure 13-8 respectively.

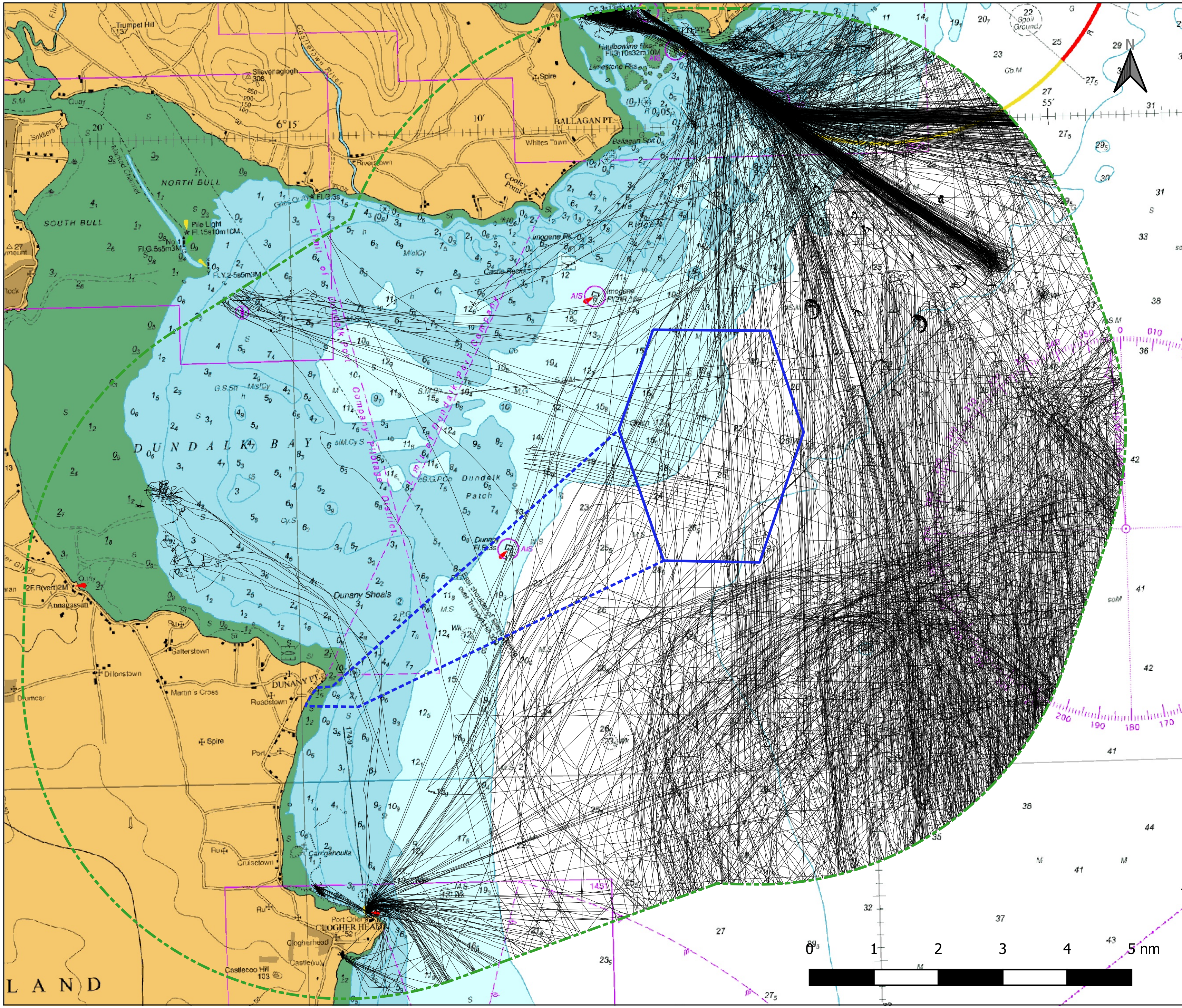
Comparing the AIS vessel tracks between 2019 (as above) and 2022, then there are no significant differences when considering all tracks, but some notable differences can be seen between the summer and winter periods.

Winter 2022 shows significant activity to/from the Warrenpoint Disposal Site which is associated with a maintenance dredging campaign by Warrenpoint Harbour. There was significantly more activity to the south of the offshore wind farm area in January 2019 compared with 2022 which relates to fishing vessel activity.

During July 2019, there were 81 individual vessel tracks through the offshore wind farm area and 68 tracks in July 2022 showing an approximate 16% reduction in vessel tracks over the two periods. There is notably significant activity to the east of the offshore wind farm area in July 2022 which was the Baltic Explorer undertaking a survey for the proposed Clogherhead offshore wind farm.

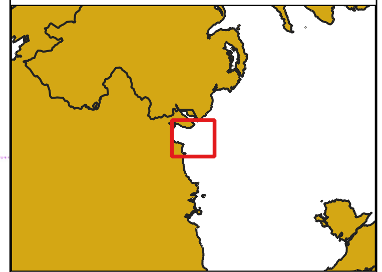
The following points have been noted when comparing the AIS data for the periods January and July 2019 with January and July 2022:

- When considering all tracks, there is no significant difference in vessel activity;
- For the winter period in 2022 there was more activity north of the offshore wind farm area due to maintenance dredging and reduced fishing activity south of the offshore wind farm area;
- For the summer period, there was a 16% reduction in tracks through the offshore wind farm area and survey activity to the east of the offshore wind farm area;
- The differences in tracks for cargo vessels, tankers and vessels transiting to/from Dundalk are minor;
- There is reduced fishing activity to the south of the offshore wind farm area and transiting fishing vessel tracks are comparable with 2019 data; and
- There is a minor increase in the number of recreational tracks crossing the offshore wind farm area in a north/south direction.



Legend

- Offshore Cable Corridor
- Offshore Wind Farm Area
- Shipping and Navigation Study Area
- Vessel Track



Client

ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project: **Oriel Wind Farm Project**

Title

Figure 13-6 AIS Vessel Tracks (January and July 2022)

RPS
A TETRA TECH COMPANY
Ireland

Issue Details

Drawn:	RM	**Project:**	MDR1520B
Checked:	AF	**File Ref:**	MDR1520QG0000D01
Approved:	ER		
Scale:	1:150,000@ A4	**Projection:**	IRENET95 / ITM
Date:	25/01/2024		

Notes

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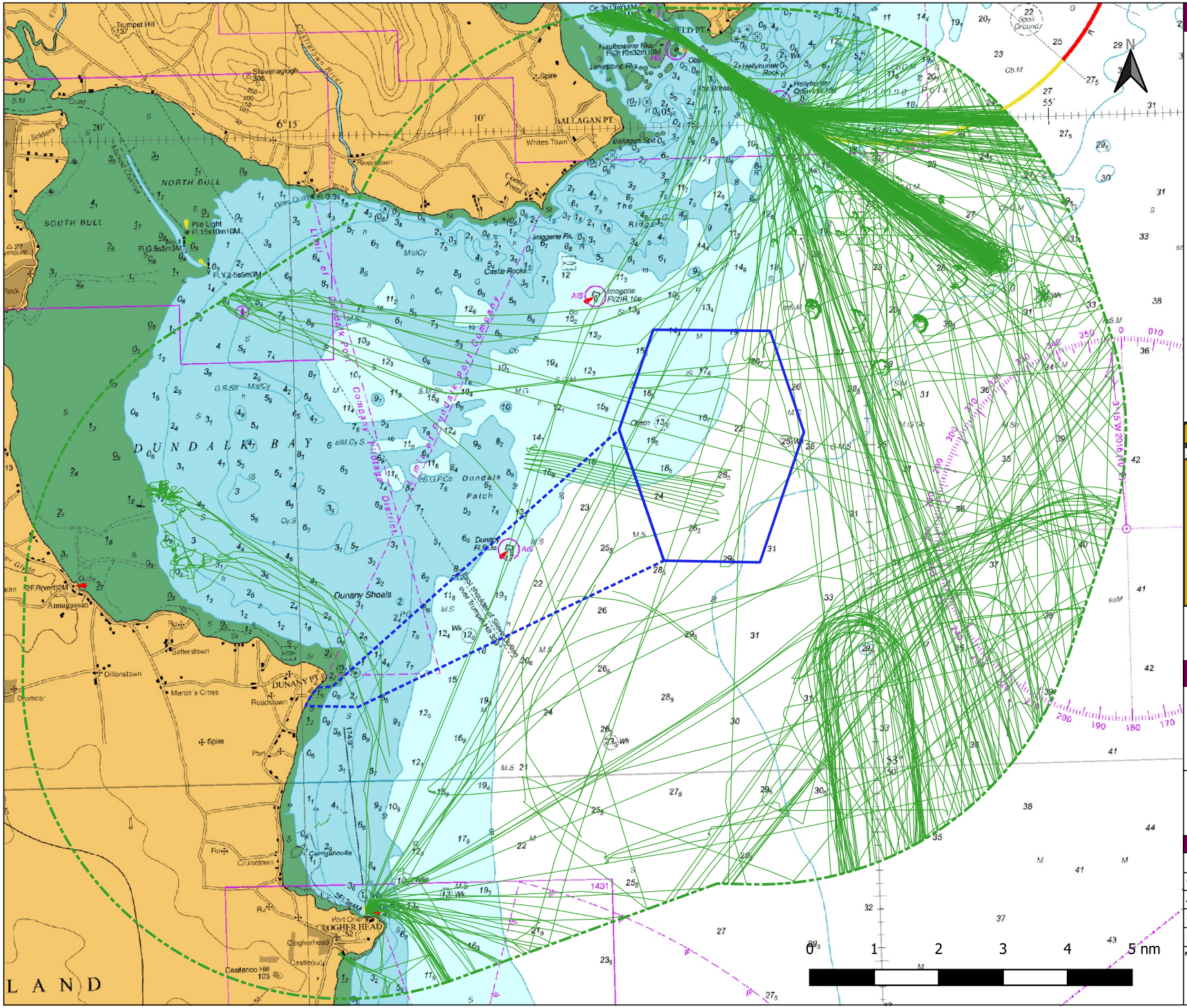
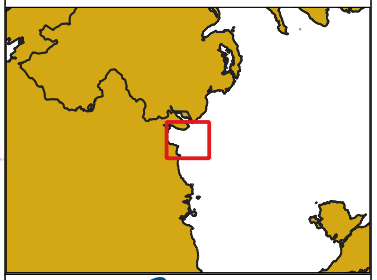


Legend

- Offshore Cable Corridor
- Offshore Wind Farm Area
- Shipping and Navigation Study Area
- January 2022 Vessel Track



Client: ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project: **Oriel Wind Farm Project**

Title

Figure 13-7 AIS Vessel Tracks (January 2022)

RPS Ireland
A TETRA TECH COMPANY

Issue Details

Drawn:	RM	**Project:** MDR1520B
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Approved:	ER	MDR1520QG0000D01
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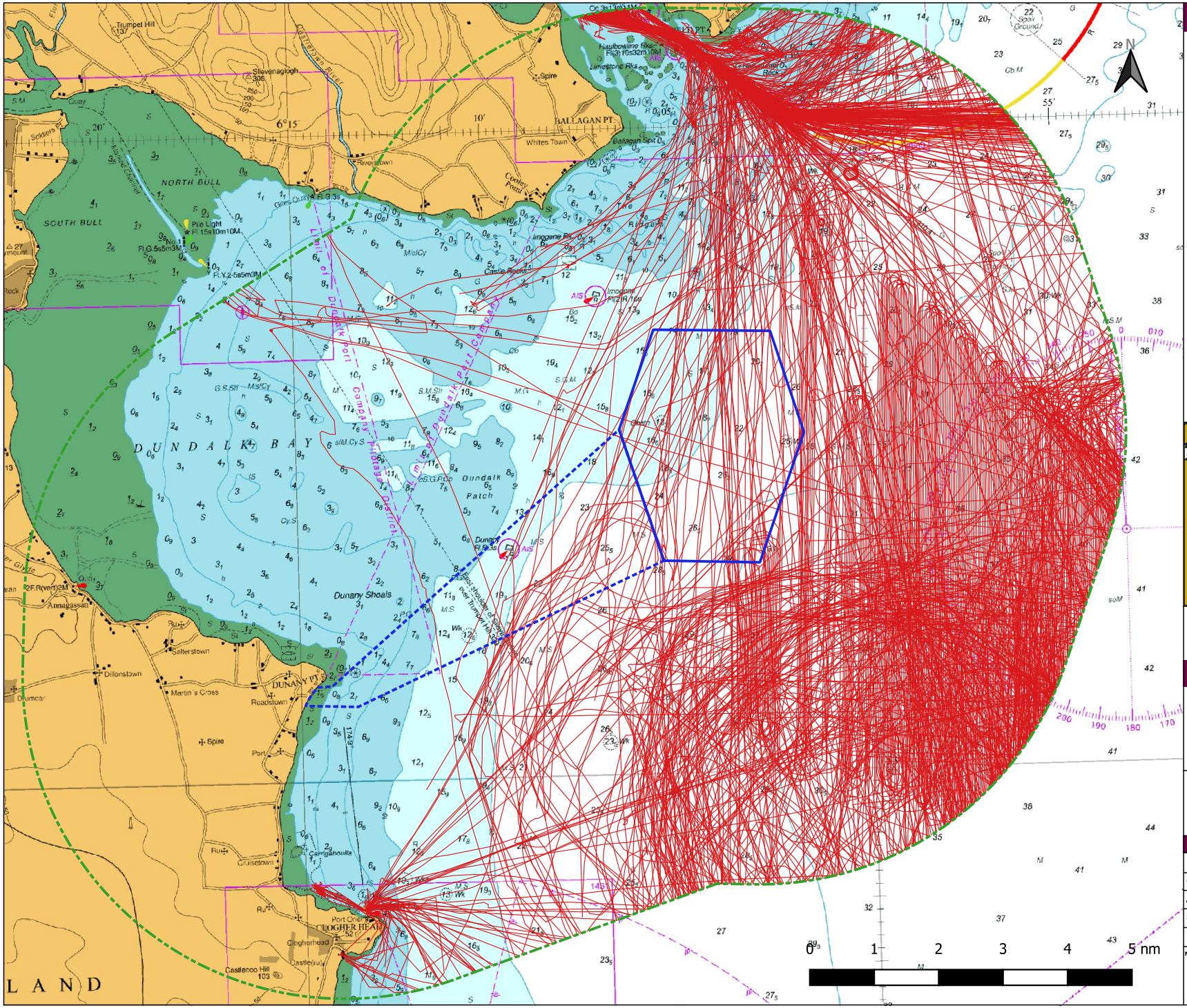
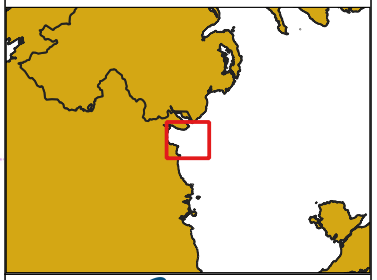


Legend

- Offshore Cable Corridor
- Offshore Wind Farm Area
- Shipping and Navigation Study Area
- July 2022 Vessel Track



Client: ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project: **Oriel Wind Farm Project**

Title

Figure 13-8 AIS Vessel Tracks (July 2022)

RPS Ireland
A TETRA TECH COMPANY

Issue Details

Drawn:	RM	**Project:** MDR1520B
Checked:	AF	**File Ref:**
Approved:	ER	MDR1520QG0000D01
Scale:	1:150,000@ A4	**Projection:**
Date:	25/01/2024	IRENET95 / ITM

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13.7.8 Historical Incidents

The Irish Marine Casualty Investigation Board were contacted as part of the Navigational Risk Assessment (see appendix 13-1: Navigation Risk Assessment) and a request made for historical incident data in the Shipping and Navigation Study Area. Details were not available for specific incidents, except those published as part of their annual report[4], which do not contain geographic details to identify the location of incidents and hence proximity to the Shipping and Navigation Study Area.

The annual report provides information on when the incident occurred, area where the incident occurred, the type of craft, type of incident, number of fatalities and a brief summary of the incident. Investigations were initiated by the Board into 11 incidents in 2022. Five of the 11 incidents which required investigation occurred in connection with fishing vessels. Two involved general cargo vessels, two recreational craft and two involved three passenger vessels.

Publicly available historical incident data for the Shipping and Navigation Study Area from the RNLI[5] shows that most RNLI 'call-outs' in the Shipping and Navigation Study Area between 2008 and 2020 were fishing vessels and recreational craft, (e.g. 'ill crewman on vessel', 'adverse conditions', 'leaks/swamping' and 'out of fuel').

13.7.9 Future baseline scenario

The European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (hereafter the EIA Regulations 2018) require that "*a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge*" is included within the EIAR.

In the event that the Project is not constructed, an assessment of the future baseline conditions has been carried out and is described within this section.

During consultation meetings (see section 13.4.1), the IRCG noted that Warrenpoint was anticipating an upturn of vessel movements following the UK's departure from the European Union and that this was worth taking into consideration when accounting for any future trading pattern. Through the data validation exercise using AIS data from 2022, there has been no appreciable increase in vessel movements at Warrenpoint.

Greenore Port has plans to develop Ro-Ro and Lo-Lo facilities over the coming years which will have the potential to increase commercial traffic throughput.

Drogheda Port are proposing to develop a new harbour at Braymore Point (south of Drogheda) which will have the potential to increase commercial traffic throughput.

Aside from the above, the future baseline scenario for shipping and navigation is considered unlikely to change substantially from that presented in section 13.7 in the absence of the Project.

13.7.10 Data validity and limitations

The data sources used in this chapter are detailed in Table 13-5.

The overall traffic profile for shipping and navigation (see section 13.7.6 and appendix 13-1: Navigation Risk Assessment) relies on AIS data. In 2000, the IMO adopted a requirement as part of a revised Chapter V of SOLAS for ships to be fitted with AIS. Vessels that carry an AIS transponder broadcast at regular intervals to all AIS receivers within VHF range key information such as identity, name, type, speed and course. Regulation 19 of SOLAS Chapter V stipulates that AIS is required to be carried on:

[4] Marine Casualty Investigation Board Annual Report 2022.

[5] Return of Service data from RNLI call-outs across the UK and Republic of Ireland.

- All ships of 300 gross tonnage and upwards related to international voyages;
- Cargo ships of 500 gross tonnage and upwards not engaged on international voyages; and
- All passenger vessels irrespective of size.

There is currently no requirement for small commercial vessels or cruising yachts to carry AIS. Under EU Directive 2009/17/EC the entire EU fishing fleet over 15 m was required to be equipped with AIS by 2014.

The use of AIS data to analyse shipping and navigation activity is, therefore, limited to vessels that are fitted with an AIS responder. This limitation has been managed by supplementing AIS data with information provided during the consultation for shipping and navigation, as summarised in section 13.4.1 and in further detail in appendix 13-1: Navigation Risk Assessment. It was agreed in consultation with the MSO that AIS data supplemented with consultation would provide sufficient information to inform the NRA.

MGN 654 requires that vessel traffic data used for a NRA is dated withing 24-months of submission. Additional AIS data was obtained for January and July 2022 and a data validation exercise was undertaken in section 4.4.3 of the NRA to determine whether the assessment was still valid. The data validation exercise concluded that that there have not been significant changes to the vessel traffic volumes or patterns between 2019 and 2022.

It is considered that the data employed in the assessment are sufficient for the purposes of the impact assessment presented.

13.8 Key parameters for assessment

13.8.1 Project design parameters

The project description is provided in volume 2A, chapter 5: Project Description. Table 13-8 outlines the project design parameters that have been used to inform the assessment of potential impacts of the construction, operational and maintenance and decommissioning phases of the Project on shipping and navigation.

Due to the potential for unexpected ground conditions and obstructions, the final route and length of the offshore export cable and offshore inter array cables will be confirmed during construction (see design flexibility details in chapter 5: Project Description (volume 2A). For the purposes of the assessment presented in section 13.10, the maximum length of cables has been considered to ensure the potential for maximum impact is assessed. Should the lengths of cables be less than those specified, then the potential for effects will not change the assessment outlined in section 13.10,. An alternative route within the offshore wind farm area or offshore cable corridor will also not change the assessment in section 13.10.

Table 13-8: Project design parameters used for the assessment of potential impacts on shipping and navigation.

Potential impact	Phase[a]			Project design parameters	Justification
	C	*O*	*D*		
Presence of Project-related vessels transiting to and from their marshalling harbour and O&M base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision.	✓	✓	✓	**Construction and decommissioning phase**: 27 installation vessels in total operating within the offshore wind farm and offshore cable corridor areas. 475 installation vessel movements (return trips). Safety zone covering full offshore wind farm area plus a 500 m buffer surrounding the area. **Operational and maintenance phase**: 352 vessel return trips per year with the O&M base located locally in County Louth	Greatest number of Project-related vessel movements and maximum vessel exclusion zones, resulting in greatest risk of vessel collision.

Potential impact	Phase[a]			Project design parameters	Justification
	C	O	D		
				or County Down. During maintenance, safety zone covering maintenance activity plus a 500 m area surrounding the activity.	
Presence of Project devices may lead to vessel-to-structure contact.	✓	✓	✓	25 WTG monopile foundations and a single offshore substation (OSS) with monopile foundation.	WTGs and OSS with the largest footprint at the sea surface resulting in greatest risk of contact.
Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear.	✓	✓	✓	16 km offshore cable length 41 km inter-array cable length Cable protection footprint of 205,000 m^2 for inter-array cables. Cable protection footprint of 80,000 m^2 for offshore cables (subtidal). Scour protection footprint of 45,239 m^2 for 25 monopile WTGs.	Maximum scour protection footprint resulting in greatest risk of snagging.

a C= Construction, O = Operation, D = Decommissioning

13.8.2 Measures included in the Project

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 13-9). These measures include designed-in and management measures (controls). As there is a commitment to implementing these measures, they are considered inherently part of the design of the Project and have therefore been considered in the assessment presented in section 13.10 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.

Table 13-9: Measures included in the Project.

Measures included in the Project	Justification
Promulgation of information and warnings through Notice to Mariners and other appropriate Maritime Safety Information (MSI) dissemination methods. Throughout the life of the wind farm, regular liaison meetings to be held between project, sub-contractors and local marine stakeholders such as local harbour authorities, pilots, fishermen, and leisure groups such as yacht clubs. Information and warnings concerning any restrictions to navigation, including the imposition of any safety zones to be promulgated by Radio Navigation Warning Signals (NAVAREA 1 or HYDROLANT), Notice to Mariners, Notice to Airmen Publication.	To ensure that all relevant parties are aware of project-related information that may affect shipping and navigation. This measure is required by legislation.
The Project to provide continuous watch by multi-channel VHF, including Digital Selective Calling (DSC).	To identify potential navigational hazards. This measure is industry best practice.
The applicant will seek to maintain advisory marine safety zones of 500 m radius to be implemented around WTGs and other offshore infrastructure undergoing construction/decommissioning or major maintenance activities. A rolling advisory clearance distance of 500 m in radius to be implemented around the cable laying vessel.	To reduce the risk of interaction between Project-related activities and other vessels. This measure is based on best practice guidance (Step Change in Safety, 2017).
Marker buoys and/or other AtoN will be deployed on a device-specific basis. AtoN Marking and Lighting Plan to be submitted to IRCG/CIL for approval and implementation prior to construction, as detailed in appendix 13-1: Navigation Risk Assessment. The plan will consider the necessary AtoN requirements (including	To ensure devices are appropriately marked for navigational safety. This measure is from international best practice guidance (IALA, 2021).

Measures included in the Project	Justification
specification, location and maintenance requirements) for the construction, operation and decommissioning phases of the Project. The AtoN management plan will be agreed prior to commencement of construction and should be developed in conjunction with IALA (2021) G1162 The Marking of Man-Made Offshore Structures.	
Project to undertake vessel traffic monitoring by: AIS, VHF, Closed Circuit Television (CCTV) with all Project-related vessels throughout all phases.	To identify potential navigational hazards. This measure is industry best practice.
The following safety documents will apply: Emergency Response Co-operation Plan (ERCoP): An ERCoP has been prepared and will be agreed with the IRCG and other key stakeholders as detailed in appendix 13-1: Navigation Risk Assessment prior to construction. The ERCoP (see volume 2A, appendix 5-8: Lighting and Marking Plan) details the emergency response planning requirements for the Project (at all stages) as directed by the IRCG and includes: • Organisational information including roles and responsibilities for emergencies, equipment and facilities and liaison arrangements between the Applicant and IRCG; • Search and Rescue information including role and responsibility of SAR coordinators, IRCG, communication requirements, SAR facilities (primary – e.g. SAR helicopters, secondary e.g. RNLI lifeboats), and medical advice / assistance; • SAR Exercise requirements; • Support Arrangements including shoreside reception arrangements, procedures on informing next of kin, etc. • Additional Information including duties and functions of various participants in SAR operations; • Project specific information (e.g. size, type and configuration of the infrastructure including support and maintenance vessels, details of proposed project activities for all phases, project SAR equipment and emergency response, etc.); and • Emergency Action Card detailing emergency contact details, wind farm summary, WTG specific information, communications, monitoring, shutdown procedures, personal SAR location devices, mass evacuation details – etc. Navigation Safety Management System (NSMS): A NSMS will collate documents for management of navigational safety relevant to the marine activities from multiple sources. This includes documents created by the Project and those in place for third parties such as construction and maintenance contractors. As such the NSMS is not a singular plan but should include documentation related to: • Navigational safety measures during construction phase; • Navigational safety measures during operations and maintenance; • Procedures for Project vessels when at the offshore wind farm area and in port; • Details on promulgation of information; and • Emergency Response procedures (links to ERCoP – see above).	To reduce risk of navigational hazards. This measure is industry best practice and taken from UK guidance (MCA, 2021b).
Provision of a guard vessel to monitor third party vessel traffic and intervene with warnings, as necessary.	To monitor third party vessel traffic and intervene with warnings as necessary.

Measures included in the Project	Justification
Guard vessels will be used during the construction/decommissioning phases on a 24-hour basis (including the cable laying), and non-standard or major maintenance during the O&M phase, to patrol the offshore wind farm area and offshore cable corridor, monitor the effectiveness of control measures and advise any passing vessels of the works being conducted.	This measure is from industry best practice.
A cable burial risk assessment will be conducted which will ensure cables are adequately buried so as not to become a navigation hazard, based on seabed characteristics and the density and distribution of vessel traffic. Where cable protection is used, this should not exceed a 5% reduction in under keel clearance (UKC). The cable burial risk assessment should be undertaken in line with the Carbon Trust Cable Burial and Risk Assessment Guidance (2015) for commercial shipping, fishing vessels and recreational craft based on: • Baseline vessel traffic analysis: Geospatial temporal/spatial analysis, shipping intensity, vessel type, size and characterisation; • Anchor / gear size / type by vessel usage and map present/future vessel anchorages/anchoring and fishing activity in proximity to the offshore cable corridor (including water depth, bed type ((geology, seabed features, bathymetry, sediments) and relevant MetOcean information); • Probabilistic modelling of anchor drag/likelihood/extent for commercial vessels based on historical incident data, recovery time, penetration, drag speed and holding ground; • Probabilistic modelling of fishing gear drag/likelihood/extent based on fishing gear type, incident data, recovery time, drag speed and holding ground; • Qualitative recreational vessel cable burial risk assessment; and • Based on results of the assessment identify the burial depth requirement for the Project cables.	To identify cable-specific navigational risks. This measure is industry best practice and taken from UK guidance (MCA, 2021b).
Subsea cables to be buried to Marine Survey Office agreed depth which provides sufficient protection without compromising UKC.	To minimise risk of anchor or fishing gear snagging. This measure is industry best practice and taken from UK guidance (MCA, 2021b).
Compliance with IMO Conventions including the International Regulations for Preventing Collisions at Sea (COLREGs) (see section 13.4.2) and SOLAS (IMO, 1974).	To ensure that standard levels of navigation and vessel safety are adhered to by all project-related vessels. This measure is required by international legislation.
Production of a Fisheries Management and Mitigation Strategy (FMMS) (volume 2A, appendix 5-6: Fisheries Management and Mitigation Strategy) in line with best practice guidance with regard to fisheries liaison management and mitigation and in consultation with local fishing interests (see chapter 12: Commercial Fisheries).	The FMMS stems from industry best practice and sets out the Project's approach to fisheries liaison and mitigation, including an outline of the measures proposed to be implemented to facilitate co-existence with commercial fishing and to minimise potential impacts. The FMMS also sets out: • Relevant commitments made within the EIAR in relation to fisheries liaison; • The roles and responsibilities and lines of communication to ensure early and ongoing liaison between the Applicant and the fishing industry in an effective manner; • The process for effective information exchange, including timeframes for distribution of project information; and • Co-existence and management measures. The Project will also seek to utilise local fishing vessels where possible on the Project (such as for Guard Boat

Measures included in the Project	Justification
	provision), and this will be undertaken through the development of the FMMS.
WTG blade air draught clearance of at least 22 m above High Water Mark (HWM).	WTGs located around the UK are required to have the lowest point (air draught) of the rotor sweep at least 22 m above HWM (ref: MGN 372 Section 2.9.1 – there is no equivalent guidance for the Republic of Ireland). The lowest point of the rotor sweep for the Project is 27 m above LAT, which is approximately 22 m above MHWS in this location. This measure is from UK guidance (MCA, 2022).
Charting of offshore structures, inter-array cables and offshore cable and landfall infrastructure on navigation charts. Inform UKHO and the Kingfisher Information Services Cable Awareness (KISCA) accordingly	To provide up-to-date navigation information to all sea users. This measure is from international best practice guidance (IALA, 2021).
Agree lines of orientation with IRCG. WTG and OSS layout plan to be agreed with IRCG/CIL prior to construction.	In conjunction with the relevant statutory bodies the layout shall include SAR Access Lanes parallel to turbine development corridors (on a line of orientation) and satisfy the width required by MGN 543 to facilitate SAR asset access. This measure is from industry best practice and UK guidance.

13.8.3 Impacts scoped out of the assessment

On the basis of the baseline environment and the Project description outlined in volume 2A, chapter 5: Project Description, a number of impacts are proposed to be scoped out of the assessment for shipping and navigation. These impacts are outlined, together with a justification for scoping them out, below in Table 13-10.

Table 13-10: Impacts scoped out of the assessment for shipping and navigation.

Potential impact	Justification
Displacement of tidally constrained vessels.	The western edge of the offshore wind farm area is approximately 1.5 NM to the east of the 10 m Chart Datum contour line and so transits of tidally constrained vessels will not be affected.
Grounding of vessels due to displacement from the offshore wind farm area.	As the offshore wind farm is located in water depths of 15 – 33 m and there is sufficient sea room around the offshore wind farm area (approximately 1 NM at the closest point between the edge of the offshore wind farm area and the 10 m contour), it is considered extremely unlikely that a vessel will run aground due to displacement – especially as the draughts of commercial vessels currently navigating the area are in the range of 4-6 m.
Increased transit distance for commercial vessels due to displacement from the offshore wind farm area.	Commercial vessels transiting to and from Drogheda and Greenore Port may be required to adjust their passage plan to pass either to the west or east of the offshore wind farm area; however, this minor adjustment will result in minimal increased transit distance and will affect a very small number of vessels, so there is no potential for likely significant effects. See appendix 13-1: Navigation Risk Assessment for further details.
Interruptions to pilotage operations due to presence of Project devices.	Carlingford Lough pilot boarding/landing area (Hellyhunter Buoy) is approximately 3.2 NM north of the northern most edge of the offshore wind farm area and therefore the operation is not affected. Dundalk pilot boarding/landing area situated in Dundalk Bay is approximately 6 NM from the western extremity of the offshore wind farm area. Vessels normally approach and depart the pilot boarding station from the east and west respectively and so will be required to adjust their passage plan accordingly and pass either to the north or

Potential impact	Justification
	south of the offshore wind farm area; however, this minor adjustment will cause minimal disruption to the operation.
Impact to vessels from snagging anchors on buried cables during operation.	The number of vessels (of all types) transiting over the proposed offshore cable corridor is very low, such that the probability of emergency anchoring would be very minimal. For example, blackout probabilities are considered to be 1.15 x 10-5 to 8.56 x 10-5 per hour. Furthermore, there are a number of measures included in the Project that will further reduce the likelihood of snagging, namely: cable burial where feasible, and where the cables cannot be buried, cable protection options that minimise anchor strikes will be implemented (see volume 2A, chapter 5: Project Description) such as charting.

13.9 Impact assessment methodology

13.9.1 Overview

The assessment on shipping and navigation has followed the methodology set out in volume 2A, chapter 3: Environmental Impact Assessment Methodology. Specific to shipping and navigation, the following guidance documents have also been considered:

- MCA MGN 654 (Merchant and Fishing) Safety of Navigation OREIs – Guidance on UK Navigational Practice, Safety and Emergency Response (MCA, 2021b);
- MCA Methodology for Assessing Marine Navigational Safety Risks of Offshore Wind Farms (2021) (MCA, 2021a);
- Revised Guidelines for Formal Safety Assessment (FSA) – Maritime Safety Council (MSC) - MEPC.2/Circular 12 (IMO, 2018); and
- Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects, Department of Communications, Climate Action and Environment (DCCAE, 2017).

13.9.2 Navigational risk assessment

Potential impacts on shipping and navigation are assessed primarily in accordance with guidance provided by the MCA, as listed in section 13.9.1. This approach is centred on risk management and requires a submission that shows that sufficient controls are, or will be, in place for the assessed risk to be judged as Acceptable or As Low as Reasonably Practicable (ALARP) (see below).

Appendix 13-1: Navigation Risk Assessment presents the results of this assessment, including a description of the assessment methodology. In summary, the likelihood of occurrence and the consequence of a hazard are assessed, then combined to produce a risk score, which enables hazards to be scored and ranked. The resulting scale can be divided into three general categories:

- Acceptable;
- ALARP; and
- Intolerable.

For each hazard identified, consequence assessments are made for two scenarios: the ‘Most Likely’ and ‘Worst Credible’ outcome.

The methodology used in the NRA determines where to prioritise risk control options for the navigational aspects of a project. The assessment on shipping and navigation has assessed potential impacts using the impact assessment methodology described in the following sections, drawing on the findings of the NRA. For each impact assessment below, the findings of the NRA are also summarised. Due to the nature of the NRA

assessment methodology, it is not straightforward to directly translate 'consequence' to 'sensitivity', so the sensitivity of a receptor (vessel type) can differ between impacts, in accordance with the NRA outcomes.

13.9.3 Impact assessment criteria

Determining the significance of effects is a process that involves defining the magnitude of the impacts and the sensitivity of the receptors. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors. The terms used to define magnitude and sensitivity are based on elements proposed in the IMO's FSA approach (IMO, 2018) which promotes using a logarithmic scale to differentiate between different levels of magnitude and further developed into industry recognised levels of magnitude confirmed through consultation with regulators.

The criteria for defining impact magnitude in this chapter are outlined in Table 13-11 below.

Table 13-11: Definition of terms relating to the magnitude of an impact.

Magnitude of impact	Definition
Major	Multiple fatalities. Total loss of property (costs over €10M). Tier 3[6] oil spill criteria reached with pollution requiring national support, chemical spillage or small gas release. International bad publicity.
High	Multiple major injuries (as described in FSA guidance – (IMO, 2018)) to persons or single fatality. Major damage to vessel(s)/infrastructure (costs €1M - €10M). Tier 2 oil spill criteria reached with pollution requiring regional support, chemical spillage or small gas release. National bad publicity; temporary closure (Adverse).
	Large scale or major benefit to people, property, environment or business (Beneficial).
Medium	Multiple minor or single major injury to person(s). Moderate damage to vessel(s)/infrastructure (costs €100k-€1M). Tier 2 oil spill criteria reached but capable of being limited to immediate area within site. Widespread bad publicity; temporary suspension of operations or prolonged restrictions (Adverse).
	Moderate benefit to people, property, environment or business (Beneficial).
Low	Minor injury to person(s). Minor damage to vessel(s)/infrastructure (costs €10k - €100k). Tier 1 oil spill criteria reached: small operational oil spill with little effect on environmental amenity. Local bad publicity or short-term loss of revenue (Adverse).
	Minor benefit to people, property, environment or business (Beneficial).
Negligible	Very minor injury to person(s). Very minor damage to vessel(s)/infrastructure (costs <€10k). No measurable oil spill. No adverse publicity or loss of revenue (Adverse).
	Very minor benefit to people, property, environment or business (Beneficial).

The criteria for defining receptor sensitivity in this chapter are outlined in Table 13-12 below.

[6] The International Petroleum Industry Environmental Conservation Association has defined the three tiers according to various characteristics based more on the capabilities of the response than on the volume or size of the spill as follows:

- Tier 1 spills use locally held resources and are less severe spills addressed by a company's internal spill management team;
- Tier 2 spills may require national or regional response teams with specialised knowledge to intervene; and
- Tier 3 spills are global in need for necessary, available, large-scale resource response.

Table 13-12: Definition of terms relating to the sensitivity of the receptor or likelihood of occurrence.

Classification	Sensitivity Definition	Likelihood Definition
Major/Frequent	Major importance, international scale and no potential for substitution	Yearly
High/Reasonably Probable	High importance, national scale and limited potential for substitution.	1 per 1 year – 10 years
Medium/Remote	High or medium importance, regional scale, limited potential for substitution.	1 per 10 – 100 years
Low/Extremely Unlikely	Low or medium importance, local scale.	1 per 100 – 10,000 years
Negligible	Very low importance, local scale.	<1 occurrence per 10,000 years

The significance of the effect upon shipping and navigation is determined by correlating the magnitude of the impact and the sensitivity of the receptor or the likelihood of occurrence. The method employed for this assessment is presented in Table 13-13. Where a range of significance of effect is presented in

Table 13-13, the final assessment for each effect is based on calculated assessment and professional judgement.

For the purposes of this assessment, any effects with a significance level of slight or less have been concluded to be not significant in terms of the EIA Regulations.

Table 13-13: Matrix used for the assessment of the significance of the effect.

Sensitivity of receptor/Likelihood	Magnitude of impact					
		Negligible	**Low**	**Medium**	**High**	**Major**
	Major/ Frequent	Imperceptible	Imperceptible or slight	Imperceptible or slight	Slight	Slight or moderate
	High/ Reasonably Probable	Imperceptible or slight	Imperceptible or slight	Slight	Slight or moderate	Moderate or major
	Medium/ Remote	Imperceptible or slight	Slight	Moderate	Moderate or major	Major or Profound
	Low/ Extremely Unlikely	Slight	Slight or moderate	Moderate or major	Major or Profound	Major or Profound
	Major/ Frequent	Imperceptible	Imperceptible or slight	Imperceptible or slight	Slight	Slight or moderate
	Negligible	Slight or moderate	Moderate or major	Major or Profound	Major or Profound	-

13.10 Assessment of significance

The potential impacts arising from the construction, operational and maintenance and decommissioning phases of the Project are listed in Table 13-8, along with the project design parameters against which each impact has been assessed.

A description of the potential effect on shipping and navigation caused by each identified impact is given below.

13.10.1 Presence of Project-related vessels transiting to and from their marshalling harbour and O&M base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision

Construction Phase

Magnitude of impact

The increased level of vessel activity during the construction of the Project due to the presence of construction vessels and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision. This potential impact will be present throughout the construction of the Project.

There will be 27 installation/construction vessels in total operating within the offshore wind farm area, and 475 construction vessel movements (return trips). Whilst it is not possible to say how many construction vessels will be transiting the area in any one day, there will be an average of three vessel movements per day over the construction phase but there will be periods where there are likely to be more movements per day dependent on the specific construction activities being undertaken. The greatest impact will be the displacement due to the proposed 'rolling' safety zones occurring across the offshore wind farm area (see section 5.5.12 in chapter 5: Project Description(volume 2A). Construction vessels heading to and from the offshore wind farm area as well as the construction area itself may displace other vessels while in transit in proximity to the offshore wind farm area.

Standard industry practices including aids to navigation (see Table 13-9) will be adhered to. The density of shipping in the Shipping and Navigation Study Area is low, with three commercial vessels per month transiting through the offshore wind farm area, and therefore the likelihood of increased encounters remains low, so the increase in collision risk is low.

The impact is predicted to be of local spatial extent, short term duration, continuous and reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be low.

Sensitivity of the receptor / Likelihood of occurrence

Commercial vessels, commercial fishing vessels (predominantly in transit), recreational vessels and wind farm construction vessels are most likely to experience the impact (and therefore be potentially sensitive to a collision) when in proximity to the offshore wind farm area.

The proposed implementation of safety zones around individual structures where necessary (volume 2A, chapter 5: Project Description) will prevent vessels accidently entering any construction area and thereby reduce the risk of collision with construction vessels.

Standard navigation regulations and on-board bridge equipment, including on construction vessels transiting to the offshore wind farm area and offshore cable corridor, will reduce collision risk.

The consequence of a collision will vary depending on the vessels involved and the potential energy of a collision. Construction vessels are anticipated to be travelling at low speeds or stationary when in the offshore wind farm area; however, construction vessels transiting to the area will be traveling at normal speeds.

The vessels outlined above are deemed to be of medium importance, regional scale and limited potential for substitution. The likelihood of this impact occurring is dependent on the frequency of vessel movements and the available sea room for vessels to take action to avoid collision. Given the number of vessel transits through the offshore wind farm area and the availability clear sea room to the east the likelihood is assessed to be remote.

The sensitivity of the receptor is therefore, considered to be medium.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be medium. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

This is confirmed by the outcome of the NRA (appendix 13-1: Navigation Risk Assessment) which concludes that residual collision risk is minor or negligible for all vessel types.

Operational and maintenance phase

Magnitude of impact

The increased level of vessel activity during the operation of the Project due to the presence of vessels carrying out maintenance works, and displacement of vessels from the offshore wind farm area during maintenance activities, may lead to vessel-to-vessel collision. This impact will be present throughout the operation of the Project. At the time of undertaking the impact assessment, the operational and maintenance base location in county Louth or Down is not confirmed. However, the selected location will not have any discernible impact on the shipping and navigation assessment.

There will be 352 vessel return trips per year. Designed-in safety measures including aids to navigation, the use of guard boats, Notices to Mariners, or safety zones covering areas of larger-scale maintenance activity plus 500 m (see Table 13-9) will be adhered to.

The density of shipping in the Shipping and Navigation Study Area is low, with three commercial vessels per month transiting through the site, and therefore the likelihood of increased encounters remains low, so the increase in collision risk is low. The impact is predicted to be of local spatial extent, short term duration, continuous and reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be low.

Sensitivity of the receptor / Likelihood of occurrence

Commercial vessels, commercial fishing vessels (predominantly in transit), recreational vessels and wind farm O&M vessels are most likely to be exposed to the impact (and therefore be potentially sensitive to a collision) when in proximity to the offshore wind farm area.

Safety measures will include the use of guard boats, Notices to Mariners, or 500 m safety zones around maintenance activities, which will prevent vessels accidently entering any maintenance areas.

Standard navigation regulations and on-board bridge equipment, including on maintenance vessels transiting to the offshore wind farm area, will reduce collision risk.

The consequence of a collision will vary depending on the vessels involved and the potential energy of a collision. Vessels involved in maintenance activities are anticipated to be travelling at low speeds or stationary when in the offshore wind farm area and offshore cable corridor; however, vessels transiting to the area will be traveling at normal speeds.

The vessels outlined above are deemed to be of medium importance, regional scale and limited potential for substitution. In terms of likelihood, there is limited vessel traffic shown along the route that the operational and maintenance vessels are likely to be using meaning that there is less potential for an interaction between vessels which could result in a collision. This means that the likelihood is assessed to be remote.

The sensitivity of the receptor is therefore, considered to be medium.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be medium The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

This is confirmed by the outcome of the NRA (appendix 13-1: Navigation Risk Assessment) which concludes that residual collision risk is minor or negligible for all vessel types.

Decommissioning phase

It is assumed that the level of vessel activity during the decommissioning phase will be equal to or less than during the construction phase. As such, the impact assessment for the construction phase as presented above is applicable to the decommissioning phase.

13.10.2 Presence of Project devices may lead to vessel-to-structure contact

Construction Phase

Magnitude of impact

The physical presence of partially or fully constructed infrastructure (installed but not operational) within the offshore wind farm area may increase the risk of vessel-to-structure contact with WTGs or the OSS. Any vessel may make contact with a WTG or OSS whilst either under power, through human error or steering failure, or whilst drifting through loss of power. This impact is most likely to occur when vessels are Not Under Command (NUC) (i.e. due to power failure). This impact will be present throughout the construction of the Project.

The magnitude of the impact will be dependent on the construction state of the Project device as well as the size of the vessel and the speed at which it is transiting the area.

Guard vessels, marker buoys and/or other Aids to Navigation will be deployed on a device-specific basis (see Table 13-9) to reduce the risk of vessel contact.

The impact is predicted to be of local spatial extent, short term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. Given the potential consequences of a contact incident the magnitude is considered to be medium.

Sensitivity of the receptor / Likelihood of occurrence

How much damage a vessel sustains on contact with a structure will depend on the energy of impact, including the size and structural integrity of the vessel and structure, as well as the meteorological conditions at the time.

Vessels which are NUC (which as identified above is the most likely reason a vessel may make contact with a WTG or OSS) are likely to be moving at lower speeds which will reduce the consequence of an encounter with a WTG or OSS. A large vessel NUC is less sensitive to a collision with a WTG or OSS than a smaller vessel due to the relative structural strength of the vessel compared with the structure. The receptors most sensitive to this impact are therefore smaller vessels including smaller fishing vessels and recreational craft.

The vessels outlined above are deemed to be of medium importance and local scale. The construction area will be marked with buoyage and location promulgated on nautical charts and notices to mariners meaning that passing vessels will be able to identify the location and amend course accordingly. This means that the likelihood is assessed to be extremely remote.

The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be medium and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

This is confirmed by the outcome of the NRA (appendix 13-1: Navigation Risk Assessment) which concludes that residual contact risk is minor or negligible for all vessel types.

Operational and maintenance phase

Magnitude of impact

The physical presence of operational infrastructure within the offshore wind farm area may increase the risk of vessel-to-structure contact with WTGs or the OSS. Any vessel may make contact with a WTG or OSS whilst either under power, through human error or steering failure, or whilst drifting through loss of power. This impact is most likely when vessels are NUC (i.e. due to power failure). Risk of contact may increase in adverse weather conditions when strong winds and tides may cause vessels to drift towards and into the offshore wind farm area. This impact will be present throughout the operation of the Project.

The number of Project-related vessels in the vicinity of the offshore wind farm area will be lower during the operational and maintenance phase than during the construction phase (see Table 13-8), so the risk of a vessel-to-structure contact is reduced during this phase.

It is likely that operators of vessels navigating in the vicinity of the offshore wind farm area will become more familiar with the presence of the wind farm as time goes on, thereby reducing the likelihood of contact with the wind farm infrastructure. However, the magnitude of the impact will be dependent on the construction state of the Project Device as well as the size of the vessel and the speed in which it is transiting the area.

The impact is predicted to be of local spatial extent, short term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. Given the potential consequences of a contact incident the magnitude is considered to be medium.

Sensitivity of the receptor / Likelihood of occurrence

How much damage a vessel sustains on contact with a structure will depend on the energy of impact, including the size and structural integrity of the vessel and structure as well as the meteorological conditions at the time.

Standard Aids to Navigation (lighting and marking) will reduce the likelihood of a vessel collision with a WTG or the OSS. All offshore infrastructure will be marked on navigation charts, through promulgation of information to UKHO and KISCA.

Vessels which are NUC are likely to be moving at lower speeds which will reduce the consequence of an encounter with a WTG or OSS. A large vessel NUC is less sensitive to a collision with a WTG or OSS than a smaller vessel due to the relative structural strength of the vessel compared with the structure. The receptors most sensitive to this impact are therefore smaller vessels including smaller fishing vessels and recreational craft.

Where vessels are under command and make contact with a WTG (e.g. due to human error), then encounter speeds could be higher than for vessels NUC – although navigation equipment on the bridge of a ship should alert the bridge team to the proximity of the WTG, and therefore it would be highly unlikely that avoiding action would not made by the bridge team and therefore a slower speed / glancing blow would be the most likely occurrence.

The vessels outlined above are deemed to be of medium importance and local scale. The individual Project devices will be marked as per international guidance with aids to navigation on the devices at the corners of the Offshore Wind Farm Area and marked on nautical charts. This means that the likelihood of a contact is considered to be extremely remote.

The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be medium and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

Decommissioning phase

During the decommissioning phase, partially deconstructed WTGs and other infrastructure may be present in a similar form to the construction phase. As such, the impact assessment for the construction phase as presented above is applicable to the decommissioning phase.

13.10.3 Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear

Construction Phase

Magnitude of impact

The presence of partially buried cables on the seabed during the construction of the Project may increase the risk of anchor snagging to commercial vessels and commercial fishing vessels (in transit), or damage to fishing gear. The magnitude of this impact depends on the increased presence of cables and the number of vessels likely to drop anchor or deploy fishing gear. Risk of snagging will also depend on the type and weight of fishing gear deployed.

For fishing vessels, the greatest potential for damage comes from the bottom travelling trawls, dredge fishing and from fishing tools deployed on or in the seabed. Any attempt to design the cable to sustain impact from such a heavy trawl would not be efficient or sufficient to reduce the damage level. Normally fishing gear does not penetrate more than 10-30 cm down into the seabed, so a cable burial depth of 0.5 m is often sufficient to protect the cable against fishing gear (International Cable Protection Committee, 2009).

Cables will be buried in the seabed where possible to a minimum burial depth of 0.5 m. There is the potential for cable protection along 50% of the inter-array cables and offshore cable corridor where burial in the seabed is not possible.

There are no charted anchorages within the offshore wind farm area or the offshore cable corridor. Emergency anchoring is unlikely to occur along the offshore cable corridor given the significant sea room available to avoid other vessels and obstacles. In the event of a blackout on a vessel, the vessel master would be expected to deploy their anchor after consulting charts to be clear of charted obstacles.

The export and inter-array cables and landfall infrastructure will be marked on navigation charts, through promulgation of information to UKHO and Kingfisher Information Services Cable Awareness (KISCA). KISCA charts, which are freely available, identify surface and subsea hazards around the coasts of the UK and Northern Europe. A rolling advisory clearance distance of 500 m in radius will be implemented around the cable laying vessel in addition to the provision of guard vessel to monitor third party vessel traffic during construction on a 24-hr basis. These measures, in combination with cable burial and protection and the low level of fishing activity within the Shipping and Navigation Study Area, reduce the risk of damage to anchors and/or fishing gear.

The impact will be short term for the construction phase only. The likelihood of impact will be highest when the cables are partially laid and not yet charted.

The impact is predicted to be of regional spatial extent, short term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is, therefore, considered to be low.

Sensitivity of the receptor / Likelihood of occurrence

As stated above, emergency anchoring by any vessel type is unlikely to occur along the offshore cable corridor given the significant sea room available to avoid other vessels and obstacles. In the unlikely event that anchoring does occur along the offshore cable corridor, the most likely scenario is that the vessel will lose its anchor and will be required to replace it.

When fishing (trawling), snagging on cables or any other underwater object is potentially hazardous to vessels.

Vessels will be made aware of cable installation activities and the location of safety zones through the promulgation of information including Notice to Mariners.

The vessels outlined above are deemed to be of medium importance and local scale. The likelihood of a snagging event occurring for fishing gear is low because of the design of gear to pass clear of underwater obstructions. The location of the export cable and inter-array cables will also be marked on nautical and Kingfisher Information Services Cable Awareness (KISCA) charts leading to the likelihood being assessed as extremely remote.

The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

This is confirmed by the outcome of the NRA (appendix 13-1: Navigation Risk Assessment) which concludes that residual snagging risk is minor or negligible for all vessel types.

Operational and maintenance phase

Magnitude of impact

There is potential for cable protection along and 50% of the inter-array cables and offshore cable corridor. Cable protection may consist of rock placement and/or concrete mattresses and may be 3 m in width and 0.3 m in height above the seabed within the offshore wind farm area; and 7 m in width and 0.5 m in height along the offshore cable corridor.

The presence of cable protection on the seabed during the operation of the Project may increase the risk of anchor snagging to commercial vessels and commercial fishing vessels (in transit), or damage to fishing gear.

The impact is predicted to be of regional spatial extent, medium term duration, intermittent and high reversibility. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be low.

Sensitivity of the receptor / Likelihood of occurrence

As stated above, emergency anchoring by any vessel type is unlikely to occur along the offshore cable corridor given the significant sea room available to avoid other vessels and obstacles. When fishing (trawling), snagging on cable protection or any other underwater object is potentially hazardous to vessels.

A cable burial risk assessment will be carried out prior to construction which will consider potential impacts to navigating vessels with respect to cable burial depths and cable protection. Post-installation surveys will be carried out to determine where target burial depth has not been achieved and where additional cable protection may be required.

Commercial vessels and commercial fishing vessels are deemed to be of medium importance and local scale. The likelihood of a snagging event occurring for fishing gear is low because of the design of gear to pass clear of underwater obstructions. The location of the export cable and inter-array cables will also be marked on nautical and KISCA charts leading to the likelihood being assessed as extremely remote.

The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

This is confirmed by the outcome of the NRA (appendix 13-1: Navigation Risk Assessment) which concludes that residual snagging risk is minor or negligible for all vessel types.

Decommissioning phase

Any exposed cables are likely to be removed to ensure they do not become hazards to other users of the seabed. The removal of buried cables is not an operation for which there is much precedent. However, it is expected that equipment similar to that used for cable installation could be used to reverse the burial process and expose them. Once the cables are exposed, grapples would be used to pull the cables onto the deck of the decommissioning vessel, cut into manageable lengths and taken to shore.

It is assumed that any cable removal activities during the decommissioning phase would result in equal or less of a risk to shipping and navigation than cable laying activities during the construction phase. As such, the impact assessment for the construction phase as presented above is applicable to the decommissioning phase.

13.10.4 Mitigation and residual effects

The assessment of impacts has concluded that there are no significant effects and therefore it is considered that no measures over those included in the Project (as outlined in section 13.8.2) are required.

Residual effects

With the implementation of the measures included in the Project (section 13.8.2), the residual effects are as outlined in the assessment provided in section 13.10.

13.10.5 Future monitoring

No shipping and navigation monitoring to test the predictions made within the impact assessment is considered necessary.

13.11 Cumulative Impact Assessment

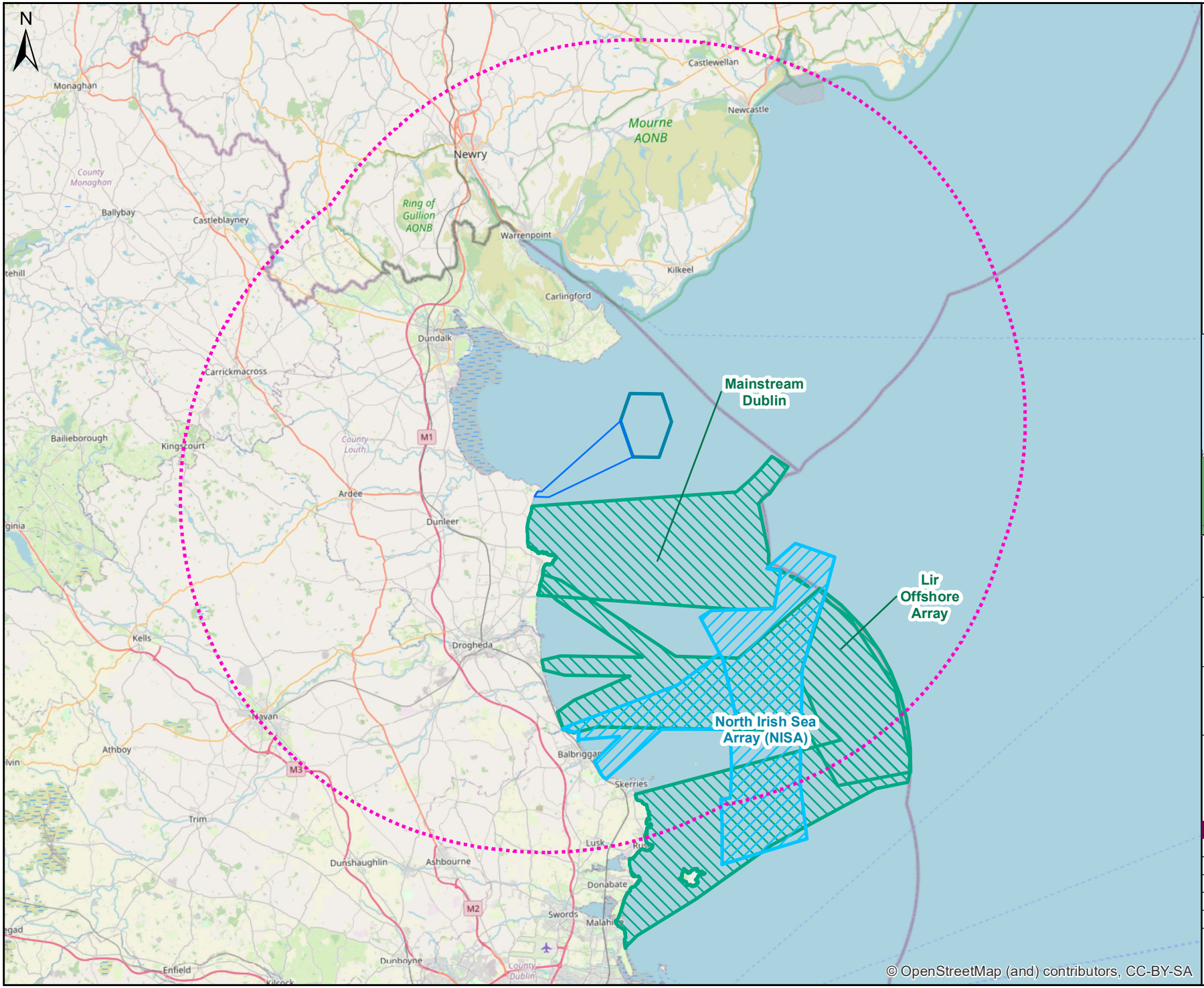
13.11.1 Methodology

The Cumulative Impact Assessment (CIA) takes into account the impact associated with the Project together with other projects. The projects selected as relevant to the CIA presented within this chapter are based upon the results of a screening exercise (see volume 2A, appendix 3.1: CIA Screening Annex). Each project 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.

The approach to CIA examines the effects of the Project alongside the following projects if they fall within the Cumulative Shipping and Navigation Study Area, defined as a radius of 20 NM from the Project (see Figure 13-9). These are:

- Other projects with consent but not yet constructed/construction not completed;
- Other projects in a consent application process but not yet determined (including planning applications, foreshore lease/licence applications, Dumping at Sea Permit applications;
- Other projects currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact; and
- Projects, which satisfy the definition of ‘relevant maritime usage’ under the Maritime Area Planning Act (2021) (i.e. wind farm projects designated as ‘Relevant Projects’ or ‘Phase 1 Projects’) including Arklow Bank II, Bray Bank and Kish Bank; North Irish Sea Array, Codling Wind Park (I and II)

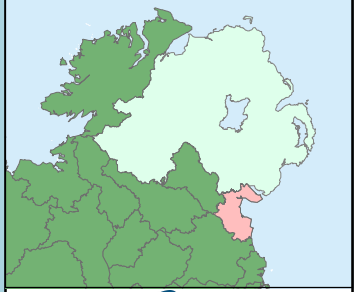
The specific projects screened into this CIA, are outlined in Table 13-14.



Legend

- Cumulative Shipping and Navigation Study Area (20 nm)
- Offshore Wind Farm Area
- Offshore Cable Corridor
- Wind Farm Application
- Site Investigation Application Area

Data Sources: OWL, CSO, gov.ie



Client

ORIEL WINDFARM
OFFSHORE RENEWABLE ENERGY

Project

Oriel Wind Farm Project

Title

Figure 13-9: Projects Screened in to the Cumulative Impact Assessment

RPS
A TETRA TECH COMPANY

West Pier Business Campus,
Dun Laoghaire,
Co Dublin,
Ireland.

Tel: +353 (0) 1 4882900
Email: ireland@rpsgroup.com
Web Page: rpsgroup.com/ireland

Issue Details

Drawn By: NR	**Project No.** MDR1520b
Checked By: EP	**File Ref:** MDR1520bArc3065F01
Approved By: CC	
Scale: 1:530,000 @ A4	**Projection:** ITM (IRENET95) Geographic Co-ordinates: ETRS89
Date: 21/03/2024	

Table 13-14: List of other projects considered within the CIA.

Project/Plan	Status	Distance from offshore wind farm area (km)	Distance from offshore cable corridor (km)	Description of Project	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with Project
Site investigation works							
Site Investigations off Co, Dublin (Mainstream, Renewable Power Ltd – Ref No. FS007373)	Planning	4.2	0.8	Foreshore Licence application for site investigation works off County Dublin. Surveys include Geophysical, Geotechnical, Metocean and Ecological site investigations.	N/A	2022-2027 (subject to award of licence).	Potential to increase vessel movements within the Cumulative Shipping and Navigation Study Area during construction phase. Potential to result in further displacement of vessels already affected by the Project.
Site Investigations for the proposed Lir Offshore Array, off Counties Louth, Meath and Dublin (Lir Offshore Array Ltd Ref No. FS007392).	Planning	15	8.1	The Foreshore Licence application is to undertake surveys and site investigations to inform development and project design for the proposed site. Surveys include geophysical, geotechnical, environmental and Metocean.	N/A	2023-2027 (subject to award of licence)	
Offshore Renewable Energy Projects							
North Irish Sea Array (NISA) (Statkraft)	Maritime Area Consent	16.2	18.1	EIA Scoping Report (2021) refers to the construction of an offshore wind farm of up to 500 MW, consisting of 36 turbines with a maximum height of 320 m and rotor diameter of up to 290 m. Offshore substation platforms may be required7.	Unknown	Unknown (Design life minimum 35 years)	Potential to increase vessel movements within the Cumulative Shipping and Navigation Study Area. Potential to result in further displacement of vessels already affected by the Project.

[7] Project website https://northirishseaarray.ie/ states that wind farm will consist of 35 to 46 turbines.

Table 13-15 presents the relevant project design parameters from Table 13-8, which are used to assess the potential cumulative impacts of the Project with the other projects identified in Table 13-14 (where information is available).

Table 13-15: Project design parameters considered for the assessment of potential cumulative impacts on shipping and navigation.

Potential impact	Phase			Project design parameters	Justification
	C	O	D		
Presence of project-related vessels transiting to and from their marshalling harbour and operational base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision.	✓	✓	✓	Project design parameters as described for the Project (see Table 13-15) assessed cumulatively with the following other projects: Construction phase only • Mainstream renewable site investigation works: four small vessels operating in and around the 20 nm cumulative NRA Study Area; • Lir Offshore Array site investigation works: four small vessels operating in and around the 20 nm cumulative NRA Study Area; and All phases • Construction of North Irish Sea Array Offshore Wind Farm (no details available on construction vessels).	Greatest predicted increase in number of vessels in the vicinity of the offshore wind farm area.
Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear	*x*	✓	x	• Operation of North Irish Sea Array Offshore Wind Farm: six offshore cables with a minimum design life of 35 years	The presence of additional cables in the Cumulative Shipping and Navigation Study Area means that there is a higher possibility for a snagging event to occur.

13.11.2 Assessment of significance

A description of the significance of cumulative effects upon shipping and navigation receptors arising from each identified impact is given below.

Presence of project-related vessels operating within the offshore wind farm area, or transiting to and from their O&M base, may lead to vessel collision

Construction Phase

Magnitude of impact

The site investigation surveys listed in Table 13-15 are each expected to involve 3-4 small vessels operating in and around the 20 NM cumulative Shipping and Navigation Study Area.

The NISA Offshore Wind Farm's construction phase may occur during the construction phase for the Project. This would mean a cumulative increase in vessel traffic which may increase the risk of collision. The NISA operation and maintenance base location is not currently known however, given the proximity of NISA to the offshore wind farm area, there is potential for the same port to be chosen. This will increase traffic at that port along with vessel traffic between the base location and the offshore wind farm areas. The NISA project has published a scoping report (North Irish Sea Array Ltd, 2021) which identifies the impact of collision between a project vessel and a third-party vessel. This impact will be assessed through a navigational risk assessment which will consider current and future baseline conditions. The level of vessel traffic is likely to be similar to that required for the Project but there is not sufficient information available to undertake a detailed assessment. However, these combined minimal increases in vessel numbers will have no

discernible cumulative impact on navigational safety in the cumulative Shipping and Navigation Study Area, and compliance with the Collision Regulations would mitigate any risk.

The magnitude of the impact is, therefore, no greater than the Project in isolation and is considered to be low.

Sensitivity of the receptor / Likelihood of occurrence

As outlined in section 13.10.1, the vessels outlined above are deemed to be of high vulnerability, medium recoverability and high value. The likelihood is considered to be remote and sensitivity of the receptor is therefore, considered to be medium.

Significance of effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be medium. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

Operational and maintenance phase

Magnitude of impact

As with the construction phase, the NISA offshore wind farm's operational phase may occur during the operational and maintenance phase for the Project, which would mean a cumulative increase in vessel traffic and the potential to increase the risk of collision. The NISA O&M base location is not currently known. However, given the proximity of NISA to the offshore wind farm area, there is potential for the same port to be chosen. This will increase traffic at that port along with vessel traffic between the base location and the offshore wind farm areas. The NISA project has published a scoping report (North Irish Sea Array Ltd., 2021) which identifies the impact of collision between a project vessel and a third-party vessel. This impact will be assessed through a navigational risk assessment which will consider current and future baseline conditions. The available information is currently not sufficient to provide a detailed assessment, however, it is assumed that the level of vessel traffic from NISA will be similar to that required for the Project.

The magnitude of the impact is, therefore, no greater than the Project in isolation and is considered to be low.

Sensitivity of the receptor / Likelihood of occurrence

As outlined above for construction phase.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be medium. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

Decommissioning phase

The decommissioning phase of NISA only may overlap with the decommissioning of the Project. It is assumed that the level of project-related vessel activity during the decommissioning phase will be equal to or less than during the construction phase. The cumulative impact assessment for the construction phase as presented above is applicable to the decommissioning phase.

Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear

Operational Phase

Magnitude of Impact

The NISA Offshore Wind Farm will increase the level of devices and cables in the 20 NM Cumulative Study Area which affects the potential for vessel snagging to occur. The magnitude of this impact depends on the number of cables, the length of the cable routes and the number of vessels likely to drop anchor or deploy fishing gear. Risk of snagging will also depend on the type and weight of fishing gear deployed. The NISA scoping report (North Irish Sea Array Ltd, 2021) has scoped in the impact of subsea cables on snagging and has included requirements for implementation and monitoring of cable protection. This means that this impact will be subject to assessment in the navigational risk assessment. There is not currently any information on the number or location of cables associated with NISA so it is not possible to undertake a detailed assessment. The magnitude would however be the same as that provided in section 13.10.3 as the presence of additional devices or cables would not change the potential consequences meaning that the magnitude is considered to be low.

Sensitivity of receptor / Likelihood of occurrence

As outlined in section 13.10.3 the vessels are deemed to be of medium importance and local scale with the likelihood being extremely remote. The sensitivity of the receptor is therefore, considered to be low.

Significance of the effect

Overall, the magnitude of the impact is deemed to be low and the sensitivity of the receptor is considered to be low. The effect will, therefore, be of **slight adverse significance**, which is not significant in EIA terms.

13.12 Transboundary effects

Due to the international nature of shipping and navigation activity, transboundary effects are an integral part of the NRA and EIAR and have been considered as part of the assessment presented in this chapter.

The potential transboundary impacts assessed within section 13.10 are summarised below:

- Presence of project-related vessels transiting to and from their marshalling harbour and O&M base, and displacement of vessels during the construction, operational and maintenance and decommissioning phases (including displacement of vessels routeing to and from international ports) may lead to vessel-to-vessel collision. Overall, the effect will be greatest in the more confined waters of a port which will be used for both Project vessels and those engaged in international trade. Ports are, however, highly regulated areas with controls in place for the management of vessel traffic. This means that the transboundary effect is considered to be minor, which is not significant in EIA terms;

- Presence of Project devices may lead to vessel-to-structure contact. This potential impact is present for vessels navigating locally and for vessels engaged on international trade transiting proximate to the offshore wind farm area. As discussed in Section 13.10.2, this is more likely to occur during a situation where a vessel is not under command which means that the transboundary effect is the same as that for the potential impact, which was assessed to be of slight adverse significance (i.e. not significant in EIA terms); and

- Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear. This effect is limited to the Project related infrastructure's footprint and due to the available control options for marking the locations on charts and promulgation of information, the transboundary effect is considered to be low which is not significant in EIA terms.

Overall there is no potential for significant transboundary effects with regard to shipping and navigation from the Project upon the interests of the UK and EEA states.

13.13 Interactions

A description of the likely interactions arising from the Project on shipping and navigation is provided in volume 2C, chapter 32: Interactions.

13.14 Summary of impacts, mitigation measures and residual effects

Table 3-16 presents a summary of the potential impacts, mitigation measures and residual effects in respect to shipping and navigation. Table 13-17 presents a summary of the potential cumulative impacts, mitigation measures and residual effects.

- Presence of Project-related vessels transiting to and from their marshalling harbour and O&M base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision;
- Presence of Project devices may lead to vessel-structure contact; and
- Presence of Project devices and cables underwear may lead to snagging and damage to anchors and/or fishing gears.

The cumulative impacts assessed include:

- Presence of Project-related vessels transiting to and from their marshalling harbour and O&M base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision; and
- Presence of Project devices and cables underwear may lead to snagging and damage to anchors and/or fishing gears.

There is no potential for significant transboundary effects with regard to shipping and navigation from the Project upon the interests of the UK and EEA states.

Table 13-16: Summary of potential environment effects, mitigation and monitoring.

Description of impact	Phase			Measures included in the project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Presence of Project-related vessels transiting to and from their marshalling harbour and O&M base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision	✓	✓	✓	Promulgation of information Continuous watch 500 m safety zones/advisory clearance distances Aids to navigation Vessel traffic monitoring Production of safety documents Provision of guard vessel Vessel compliance with standards Production of a Fisheries Liaison Plan Marine coordination Air draught clearance Charting Agree lines of orientation	C: Low O: Low D: Low	C: Medium O: Medium D: Medium	C: Slight adverse O: Slight adverse D: Slight adverse	None	C: Slight adverse O: Slight adverse D: Slight adverse	None
Presence of Project devices may lead to vessel-to-structure contact	✓	✓	✓	Promulgation of information Continuous watch 500 m safety zones/advisory clearance distances Aids to navigation Vessel traffic monitoring Production of safety documents Provision of guard vessel Vessel compliance with standards Production of a Fisheries Liaison Plan Marine coordination Air draught clearance Charting Agree lines of orientation	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Slight adverse O: Slight adverse D: Slight adverse	None	C: Slight adverse O: Slight adverse D: Slight adverse	None
Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear	✓	✓	✓	Cable burial risk assessment Agree under keel clearance Promulgation of information Continuous watch 500 m safety zones/advisory clearance distances Aids to navigation Vessel traffic monitoring Production of safety documents Provision of guard vessel Vessel compliance with standards Production of a Fisheries Liaison Plan Marine coordination Charting	C: Low O: Low D: Low	C: Low O: Low D: Low	C: Slight adverse O: Slight adverse D: Slight adverse	None	C: Slight adverse O: Slight adverse D: Slight adverse	None

Table 13-17: Summary of potential cumulative environment effects, mitigation and monitoring.

Description of impact	Phase C	Phase O	Phase D	Measures included in the project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Further measures	Residual effect	Proposed monitoring
Presence of project-related vessels transiting to and from their marshalling harbour and O&M base, and displacement of vessels from the offshore wind farm area, may lead to vessel-to-vessel collision	✓	✓	✓	Promulgation of information Continuous watch 500 m safety zones/advisory clearance distances Aids to navigation Vessel traffic monitoring Production of safety documents Provision of guard vessel Vessel compliance with standards Production of a Fisheries Liaison Plan Marine coordination Air draught clearance Charting Agree lines of orientation	C: Low O: Low D: Low	C: High O: High D: High	C: Slight adverse O: Slight adverse D: Slight adverse	None	C: Slight adverse O: Slight adverse D: Slight adverse	None
•Presence of Project devices and cables underwater may lead to snagging and damage to anchors and/or fishing gear	x	✓	x	Cable burial risk assessment Agree under keel clearance Promulgation of information Continuous watch 500 m safety zones/advisory clearance distances Aids to navigation Vessel traffic monitoring Production of safety documents Provision of guard vessel Vessel compliance with standards Production of a Fisheries Liaison Plan Marine coordination Charting	O: Low	O: Low	O: Slight adverse	None	O: Slight adverse	

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