Morecambe Offshore Windfarm: Generation Assets

Environmental Statement

Volume 5

Chapter 17 Infrastructure and Other Users (Tracked)

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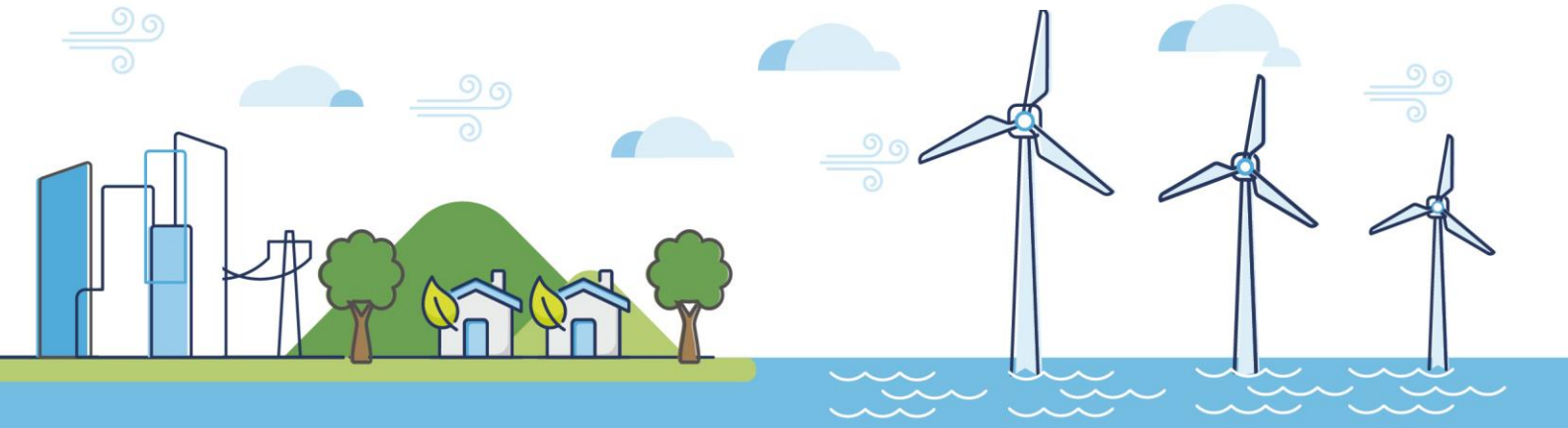

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Contents

Tables

Figures

Glossary of Acronyms

AfL	Agreement for Lease
BEIS	Department for Business, Energy and Industrial Strategy[1]
BMAPA	British Marine Aggregate Producers Association
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CAT	Commercial Air Transport
CCS	Carbon Capture and Storage
CCSA	Carbon Capture and Storage Association
CCUS	Carbon Capture, Usage and Storage
CEA	Cumulative Effect Assessment
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CIRIA	Construction Industry Research and Information Association
CO_2	Carbon Dioxide
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
CPC	Central Processing Complex
DCO	Development Consent Order
DECC	Department of Energy and Climate Change[1]
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
EIA	Environmental Impact Assessment
EIS	Eastern Irish Sea
EMODnet	European Marine Observation and Data Network
EnBW	Energie Baden-Württemberg AG
Eni	ENI UK Limited
ERRV	Emergency Response and Rescue Vessel
ES	Environmental Statement
ESCA	European Subsea Cable Association
HRA	Habitats Regulations Assessment
ICPC	International Cable Protection Committee
IMC	Instrument Meteorological Conditions

[1] The Department of Energy and Climate Change (DECC) was disbanded and merged with the Department for Business, Innovation and Skills to form the Department for Business, Energy and Industrial Strategy (BEIS) in2016. As of February 2023, BEIS is known as the Department for Energy Security and Net Zero (DESNZ).

IoM	Isle of Man
IPMP	In Principle Monitoring Plan
KIS-ORCA	Kingfisher Information Service - Offshore Renewable & Cable Awareness
LSE	Likely Significant Effects
MCA	Maritime and Coastguard Agency
MCC	Manx Cable Company
MGN	Marine Guidance Note
MMO	Marine Management Organisation
MMV	Monitoring, Measurement and Verification
MOD	Ministry of Defence
NE	Natural England
NPS	National Policy Statements
NRA	Navigation Risk Assessment
NSIP	Nationally Significant Infrastructure Projects
NSTA	North Sea Transition Authority [2]
NtM	Notice to Mariners
OFTO	Offshore Transmission Owner
OSP	Offshore substation platform
PDE	Project Design Envelope
PEIR	Preliminary Environmental Information Report
PEXA	Practice and Exercise Areas
PINS	Planning Inspectorate
PSV	Platform Supply Vessel
RAF	Royal Air Force
REWS	Radar Early Warning Systems
RSPB	Royal Society for the Protection of Birds
RYA	Royal Yachting Association
SAR	Search and Rescue
S-P-R	Source-Pathway-Receptor
SSE	Scottish and Southern Electricity Networks
TCE	The Crown Estate
TH	Trinity House
TSC	Territorial Sea Committee

[2] Formerly Oil and Gas Authority.

UKCS	UK Continental Shelf
UNCLOS	The United Nations Convention on the Law of the Sea
UXO	Unexploded Ordnance
VMC	Visual Meteorological Conditions
WTG	Wind turbine generator
ZoI	Zone of Influence

Glossary of Unit Terms

bcm	billion cubic metres
GW	gigawatt
km	kilometre
km^2	~~kilometre squared~~ square kilometre
m	metre
m^2	~~metre squared~~ square metre
m^3	~~metre cubed~~ cubic metre
MW	megawatt
nm	nautical mile

Glossary of Terminology

Applicant	Morecambe Offshore Windfarm Ltd
Application	This refers to the Applicant's application for a Development Consent Order (DCO). An application consists of a series of documents and plans which are published on the Planning Inspectorate's (PINS) website.
Agreement for Lease (AfL)	Agreements under which seabed rights are awarded following the completion of The Crown Estate tender process.
Generation Assets (the Project)	Generation assets associated with the Morecambe Offshore Windfarm. This is infrastructure in connection with electricity production, namely the fixed foundation wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s).
Inter-array cables	Cables which link the WTGs to each other and the OSP(s).
Instrument Meteorological Conditions	Weather conditions that require pilots to fly primarily by reference to flight instruments
Landfall	Where the offshore export cables would come ashore.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The transmission assets for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes the OSP(s)[3], interconnector cables, Morgan offshore booster station, offshore export cables, landfall site, onshore export cables, onshore substations, 400kV cables and associated grid connection infrastructure such as circuit breaker infrastructure. Also referred to in this chapter as the Transmission Assets, for ease of reading.
Offshore export cables	The cables which would bring electricity from the offshore substation platform to the landfall.
Offshore substation platform(s) (OSP(s))	A fixed structure located within the windfarm site, containing electrical equipment to aggregate the power from the WTGs and convert it into a more suitable form for export to shore.
Onshore export cables	The cables which would bring electricity from landfall to the onshore project substation and from the onshore project substation to a National Grid substation.
Platform link cable	An electrical cable which links one or more OSP(s).

[3] At the time of writing the Environmental Statement (ES), a decision had been taken that the OSP(s) would remain solely within the Generation Assets application and would not be included within the Development Consent Order application for the Transmission Assets. This decision post-dated the Preliminary Environmental Information Report (PEIR) that was prepared for the Transmission Assets. The OSP(s) are still included in the description of the Transmission Assets for the purposes of this ES as the cumulative effects assessment carried out in respect of the Generation/Transmission Assets is based on the information available from the Transmission Assets PEIR.

Safety Zones	An area around a structure or vessel which should be avoided, as set out in Section 95 of the Energy Act 2004 and the Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations due to the flow of water.
Study area	This is an area which is defined for each Environmental Impact Assessment (EIA) topic which includes the offshore development area as well as potential spatial and temporal considerations of the impacts on relevant receptors. The study area for each EIA topic is intended to cover the area within which an effect can be reasonably expected. For the purpose of the infrastructure and Other Users assessment, this area is 50km.
Technical stakeholders	Technical consultees are organisations with detailed knowledge or experience of the area within which the Project is located and/or receptors which are considered in the EIA and Habitats Regulations Assessment (HRA). Examples of technical stakeholders include Marine Management Organisation (MMO), local authorities, Natural England (NE) and the Royal Society for the Protection of Birds (RSPB).
Unconstrained Areas	Areas within the windfarm site where WTGs or OSP(s) would be located, used when developing layout scenarios within the windfarm site and secured in the DCO by Protective Provisions
Visual Meteorological Conditions	Represent the weather conditions that permit pilots to operate an aircraft primarily using visual navigation techniques
Windfarm site	The area within which the WTGs, inter-array cables, OSP(s) and platform link cables will be present.
Wind turbine generator (WTG)	A fixed structure located within the windfarm site that converts the kinetic energy of wind into electrical energy.
Zone of Influence (ZoI)	The maximum anticipated spatial extent of a given potential impact.

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17 Infrastructure and Other Users

17.1 Introduction

17.1 This chapter of the Environmental Statement (ES) considers the potential effects of the proposed Morecambe Offshore Windfarm Generation Assets (the Project) on infrastructure and other users. This chapter provides an overview of the existing environment, followed by an assessment of the potential effects and associated mitigation, where identified, for the construction, operation and maintenance and decommissioning phases.

17.2 The Project includes the Generation Assets to be located within the windfarm site (wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s)). The Environmental Impact Assessment (EIA) of the Morgan and Morecambe Offshore Wind Farms (Transmission Assets), including offshore export cables to landfall and onshore infrastructure, is part of a separate Development Consent Order (DCO) application as outlined in **Chapter 1 Introduction** (Document Reference 5.1.1).

17.3 This assessment has been undertaken with specific reference to the relevant legislation and guidance, of which the primary sources are the National Policy Statements (NPS). Details of these, and the methodology used for the EIA and Cumulative Effect Assessment (CEA) are presented in **Chapter 6 EIA Methodology** (Document Reference 5.1.6) and **Section 17.4** of this chapter.

17.4 Infrastructure and other users considered in this assessment include recreational users, offshore windfarm projects, other marine renewable developments, oil and gas activity, marine aggregate extraction, marine disposal sites, telecommunication cables, electricity cables, pipelines, and Carbon Capture and Storage (CCS) projects. Potential effects of the Project on ferries, commercial shipping and freight are addressed in **Chapter 14 Shipping and Navigation**.

17.5 Relevant ES chapters that have informed the assessment of effects on the infrastructure and other user receptors, are as follows:

- **Chapter 13 Commercial Fisheries** (Docucment Reference 5.1.13) – consideration of associated consultation with anglers
- **Chapter 14 Shipping and Navigation** (Document Reference 5.1.14) – consideration of recreational vessels and recreational fishing vessels
- **Chapter 16 Civil and Military Aviation and Radar** (Document Reference 5.1.16) – consideration of relevant effects on air navigation

- **Chapter 20 Socio-economics, Tourism and Recreation** (Document Reference 5.1.20) – consideration of tourism and onshore recreation as required

17.6 Inter-relationships with these chapters are further described in **Section 17.9** and related consultation across these chapters is discussed in **Section 17.2**.

17.7 Additional studies used to inform this assessment are provided in the following appendices:

- **Appendix 17.1 Helicopter Access Report** (Document Reference 5.2.17.1)
- **Appendix 17.2 Radar Early Warning System Technical Report** (Document Reference 5.2.17.2)

17.2 Consultation

17.8 Consultation regarding infrastructure and other users has been undertaken in line with the general process described in **Chapter 6 EIA Methodology**, as well as targeted consultation with other marine user groups as required. The key elements undertaken to inform this ES have included Scoping (Scoping Opinion from the Planning Inspectorate (PINS) received on 2nd August 2022) (Scoping Report and Scoping Opinion, Document Reference 5.4), comments received on the Preliminary Environmental Impact Assessment (PEIR) which was published in April 2023 for statutory consultation, and targeted consultation with other users and operators, including:

- Consultation events advertised to fishing communities
- Regular meetings with oil and gas operators
- Meetings with surrounding offshore wind developers and cable operators

17.9 Further relevant consultation has been undertaken as part of the following technical chapters:

- **Chapter 13 Commercial Fisheries** – Consultation with commercial fishermen (and anglers) and organisations, with any information gained on recreational activities highlighted as relevant to this chapter
- **Chapter 14 Shipping and Navigation** – Consultation as part of the Navigation Risk Assessment (NRA) process which includes recreational and other marine users as relevant to this chapter
- **Chapter 16 Civil and Military Aviation and Radar** – Including consultation with airports and aviation stakeholders as relevant to this chapter

17.10 The feedback received throughout the consultation process has been considered in preparing the ES. The key comments pertinent to this chapter are shown in **Table 17.1**~~**Table 17.1**~~, alongside details of how the Project team has had regard to the comments received and how they have been addressed.

17.11 The consultation process is described further in **Chapter 6 EIA Methodology**. Full details of the consultation undertaken throughout the EIA process is presented in the Consultation Report (Document Reference 4.1) which is submitted as part of the Development Consent Order (DCO) Application.

Table 17.1 Consultation responses received in relation to infrastructure and other users and how these have been addressed in the ES

Consultee	Date	Comment	Response/where addressed in the ES
Scoping Opinion responses			
PINS (ref 3.11.1)	2nd August 2022	Impacts on or from nuclear power stations - The Applicant proposes to scope out effects on or from nuclear power stations for all phases of the Proposed Development. The Scoping Report states that there are three nuclear power stations along the coastline of the Irish Sea, but potential impacts on or from these facilities have been scoped out as there is no overlap with any existing infrastructure. On the basis that there is no overlap in infrastructure, the Inspectorate is content to scope this matter out of further assessment.	Noted.
PINS (ref 3.11.2)	2nd August 2022	Impacts on Ministry of Defence (MOD) activities - The Applicant seeks to scope out impacts on MOD activities on the basis of the distance between the Proposed Development and known practice and exercise areas (PEXA). The Inspectorate notes that the MOD has no concerns about this approach and therefore agrees that this matter can be scoped out of further assessment. However, the Applicant should ensure that the ES covers effects on the surveyed routes which support defence maritime navigational interests referred to by the MOD (see Appendix 2 of this Opinion).	Noted, the Applicant has engaged with the MOD regarding highly surveyed routes and it has been determined by the MOD 'that the extent of the development zone for generating infrastructure, as identified in the scoping submission, does not extend over the highly surveyed routes' (**Section 17.5.5**).

Consultee	Date	Comment	Response/where addressed in the ES
PINS (ref 3.11.3)	2nd August 2022	Potential transboundary impacts - The Scoping Report seeks to scope these matters out of further assessment on the grounds that the only potential transboundary receptors are cables owned by international operators which would already be covered by the assessments in the ES. The Inspectorate agrees that this matter can be scoped out of further assessment.	Noted.
PINS (ref 3.11.4)	2nd August 2022	It is noted that the study area is a 50km radius from the Proposed Development, but the Scoping Report does not explain why this extent has been chosen. The ES should provide a justification for the extent of the study area and why it is considered to reflect the zone of influence (ZoI) for the Proposed Development.	The study area is designed to capture all direct and indirect interactions with infrastructure and other users, as justified in **Section 17.3**.
PINS (ref 3.11.5)	2nd August 2022	Unexploded ordnance (UXO) - The Scoping Report states that there is potential for UXO within the Irish Sea and the exact locations of any UXO would be determined post-consent following discussion with relevant consultation bodies. As noted in section 2.1 of this Opinion, the ES should include a high-level assessment of the likely significant effects (LSE) associated with UXO clearance.	UXO potential across the site has been established through desk study, with a pre-construction survey planned to identify any UXO and need for clearance. The potential presence and impacts of UXO clearance on other marine users are identified at a high level in **Section 17.5.8**.

Consultee	Date	Comment	Response/where addressed in the ES
Targeted consultation			
Spirit Energy and Harbour Energy	Regular meetings, initiated in 2019 (refer to PEIR comments later in this table)	The location of the Project windfarm site was selected with coordination and coexistence with other activities, developers and operators in mind. The Project has been engaging with Spirit Energy and Harbour Energy since 2019.	Assessments of impacts to oil and gas infrastructure are assessed in this Chapter with further detail in **Appendix 17.1, 17.2** and **Chapter 14 Shipping and Navigation**. Full details of meetings are detailed in the Consultation Report submitted as part of the DCO Application.
ENI UK Limited	Meeting in April 2024	Meeting to discuss the Applicants assessment of impacts to oil and gas infrastructure.	The impacts around platform access are assessed in **Section 17.6** and in **Appendix 17.1**.
Offshore windfarm developers (including Ørsted and Scottish Power Renewables)	Meetings undertaken in October 2023 to discuss comments provided on the PEIR (refer to PEIR comments later in this table)	There is a recognised need for co-existence with existing offshore wind projects and other infrastructure in and around the windfarm site.	An assessment has been made in respect to other offshore windfarm projects in **Sections 17.6.1.1, 17.6.2.10** and **17.7.** The Applicant has undertaken engagement with operators, which would continue as the Project design progresses to facilitate effective co-existence.
Cable owners (Vodaphone -Vodafone Lanis 1 telecom cable, Aqua coms - Havhingsten telecom cable, Pelagian/ Exa infrastructure -	Meetings throughout the pre-application period		Meetings held with cable operators regarding survey works and the Applicant is continuing engagement regarding the proximity of Project infrastructure as the design progresses. Measures to support co-existence are outlined in **Table 17.3~~Table 17.3~~**.

Consultee	Date	Comment	Response/where addressed in the ES
Hibernia 'A' telecom cable/ EXA Atlantic telecom cable)			
Local open face to face meetings (advertised to the fishing community) at Whitehaven/Workington, Lancaster, Rhyl and Conwy	28th – 30th November 2022	Discussions around the impact of the Project on fishing activity	Potential effects on angling are addressed in **Section 17.6.1.5** and **17.6.2.5**. Further consultation is detailed in **Chapter 13 Commercial Fisheries**.
Local open face to face meetings (advertised to the fishing community) at Annan, Blackpool, Conwy, Whitehaven and Kirkcudbright	19th – 21st September 2023		
The Crown Estate	Meetings during the pre-application period	Discussions on Project development and matters in relation to the Agreement to Lease signed with The Crown Estate (TCE) in January 2023. Obtaining appropriate seabed activity licences for applicable surveys. Throughout the development of the Project, the Applicant has held regular meetings with TCE, providing updates to the consenting process, consultation with stakeholders and providing insight to ongoing Project assessments. As the Project is entirely based at sea, and outside of the 12 nautical mile (nm) limit, under Section 44 of the Planning Act 2008, the Applicant consulted with TCE during the statutory consultation in 2023.	TCE requirements are considered when planning surveys and progressing Project design and development.

Consultee	Date	Comment	Response/where addressed in the ES
Statutory consultation feedback on the PEIR			
Isle of Man Government	2nd June 2023	Crogga Hydrocarbon site The Department of Infrastructure has issued a Seaward Production Innovate Licence to Crogga Limited in respect of the hydrocarbon block 112/25. This licence commenced on 1st January 2019. It may be worth noting that this site is not listed in Table 16 of the Shipping and Navigation Chapter, nor in Table 17.14 of the Infrastructure and Other Users Chapter although acknowledging it is located further than the other oil and gas fields within the vicinity of the proposed Morecambe Bay Array Area that are listed.	Noted. This hydrocarbon block has been added to **Table 17.14~~Table 17.14~~.**
Isle of Man Government	2nd June 2023	The Territorial Sea Committee (TSC) appreciates that there is mention, and inclusion of the Isle of Man interconnector between the Island and England as part of this chapter as it transects through the proposed Morgan array areas.	It is noted that the Isle of Man Interconnector is 4.6km (c.2.5nm) to the north of the Project windfarm site and as such there is no expected direct interaction with the Isle of Man interconnector. These comments are considered relevant to the Morgan Offshore Wind Project. Increased vessel traffic in the area is noted however and considered as part of **Chapter 14 Shipping and Navigation**.
Isle of Man Government	2nd June 2023	Third-Party Damage Survey works [Geotechnical] which are invasive and interacts with the sea bed in close proximity to the Isle of Man (IoM) interconnector. High level of concern Request developer engages as soon as it is practicable with Manx Cable Company (MCC) to review any survey with 1NM and assess the risk presented by the proposed survey works due to its nature and proximity.	
Isle of Man Government	2nd June 2023	Third-Party Damage Cable installation [export cables]	

Consultee	Date	Comment	Response/where addressed in the ES
		High level of concern Request developer engages as soon as it is practicable with MCC to review any cable installation activities with 1NM and assess the risk presented by the proposed works due to it nature and proximity. MCC considered it appropriate for the developer to engage as soon as reasonably practicable with MCC to commence discussions on the potential requirements for crossing and proximity agreements, associated with export cables/infrastructure, to minimise issues/delays as the Project progresses."	
Isle of Man Government	2nd June 2023	Third-Party Damage Fixed Structure installation [offshore sub-stations] High level of concern Request developer engages as soon as it is practicable with MCC to review any offshore construction activities with 1NM and assess the risk presented by the proposed works due to it nature and proximity. MCC considered it appropriate for the developer to engage as soon as reasonably practicable with MCC to commence discussions on the potential requirements for crossing and proximity agreements, associated with export cables/infrastructure, to minimise issues/delays as the Project progresses.	
Isle of Man Government	2nd June 2023	Operational Risk Close proximity of fixed structures such as offshore substations	

Consultee	Date	Comment	Response/where addressed in the ES
		Medium level of concern Request developer engages as soon as it is practicable with MCC to open dialogue on determining a suitable proximity limit where the planned proximity of any fixed structure is within 1NM of the IoM interconnector. MCC considered it appropriate for the developer to engage as soon as reasonably practicable with MCC to commence discussions on the potential requirements for crossing and proximity agreements, associated with export cables/infrastructure, to minimise issues/delays as the Project progresses."	
Isle of Man Government	2nd June 2023	Operational Risk Third-party cable crossings Medium level of concern Request developer avoids, wherever possible, multiple crossings of the IoM interconnector by export, collector and/or array cables. Where multiple cable crossings are necessary, the crossing of cables should be spaced and agreed so that, timely and economical repairs to both the crossing and crossed cables can be undertaken. MCC considered it appropriate for the developer to engage as soon as reasonably practicable with MCC to commence discussions on the potential requirements for crossing and proximity agreements, associated with export cables/infrastructure, to minimise issues/delays as the Project progresses.	

Consultee	Date	Comment	Response/where addressed in the ES
Isle of Man Government	2nd June 2023	Potential Design/Construction Conflict Several options for future interconnection, via a second sub-sea interconnector cable, between IoM & UK are currently being considered with one potential offshore cable route/corridor running to the south of the proposed Morecambe Windfarm and landing south of Blackpool. Low level of concern At present these plans and options are still in the high-level feasibility stage but it is considered appropriate to highlight and share our plans for information purposes at this time. As more information becomes available Manx Utilities will be able provide more information as appropriate.	Noted, this information has been added to **Section 17.5.3.3** to acknowledge this Project within the cumulative assessment, however given the early stages of the plans no detailed assessment can be made.
Harbour Energy	2nd June 2023	Infrastructure and Other Users PEIR Ref Table 17.2 Realistic worst-case scenarios for infrastructure and other users, Table 17.3 Embedded mitigation measures, Section 17.50 To maintain access to the Calder platform to support operational activities and future decommissioning activities, the Calder platform requires an aviation access sector free from any wind turbine generators (including rotors) comprising of: 1. A radius of 6.1km (3.3nm) around the Calder platform; and 2. A 3.7km (2nm) wide corridor oriented into the prevailing wind and extending from the centre of the platform to a distance of 13.0km (7nm).	The location of the Project windfarm site was selected with coordination and co-existence with other activities, developers and operators in mind. The Applicant has been in regular engagement with Harbour Energy throughout the development of the Project to date. Amendments to the windfarm site boundary have been made since PEIR which means that the Calder platform now lies outside of the windfarm site. The Calder platform is 0.9km (ca. 0.5nm) from the western boundary of the windfarm site and 1.5nm from the Morecambe Unconstrained Areas (areas where WTGs or OSPs can be located, as per embedded mitigation

Consultee	Date	Comment	Response/where addressed in the ES
		Within the PEIR there are numerous references to a 1.5nm helicopter traffic zone. However, any windfarm layout that has wind turbine generators within 6.1km (3.3nm) of the Calder platform would result in a significant reduction in flight availability and would create a restriction on operational activities by way of impeding our emergency response capabilities. Harbour Energy intends to discuss this matter further with the Morecambe Wind Farm Project team in the spirit of developing solutions for co-existence.	set out in **Section 17.3.3**) as secured in the draft DCO. The impacts around platform access are assessed in **Section 17.6**, and in **Appendix 17.1**. The Helicopter Access Study (**Appendix 17.1**) shows that future Commercial Air Transport (CAT) access to the Calder platform would be restricted to day VMC by the presence of WTGs. Whilst this would be a logistical impact on the operator, Search and Rescue (SAR) access would remain unaffected, as identified in **Appendix 17.1**. Engagement is ongoing with Harbour Energy on the terms of a suitable cooperation and coexistence agreement, with protective provisions which make provision for additional costs if required included in the draft DCO for completeness (these are not expected to be required in the current form in addition to the cooperation agreement). An Emergency Response and Cooperation Plan (ERCoP) would be drafted post-consent, and the Applicant will liaise on these matters with other operators in the region including Harbour Energy.

Consultee	Date	Comment	Response/where addressed in the ES
Harbour Energy	2nd June 2023	Shipping and Navigation PEIR Ref Section 14.6.5 Oil and gas vessels The Calder platform will require marine access corridors free from temporary or permanent surface infrastructure (except as may from time to time be approved by the Calder Operator) as follows: 1. a radius of 1.8km (1nm) around the Calder platform; 2. a 1.8km (1nm) corridor between the Calder and CPP1 platforms; and 3. 500m each side of the Calder pipelines and subsea cables. The marine corridors list above are to ensure the safe passage and manoeuvring of vessels supporting both the operation and future decommissioning activities of the platform and associated subsea facilities.	As noted in above response, the Calder platform no longer sits within the windfarm site following the revision to the windfarm site boundary. The Calder platform, has now unobstructed access to the north (including access between Calder and the CPP1 platform) and west. Embedded mitigation set out in **Section 17.3.3** includes that WTGs and OSP(s) would be separated from oil and gas platforms with a helideck by a 1.5nm radius buffer zone, and WTGs/OSP(s) would not be placed within 500m of existing pipelines and cables unless agreed otherwise. These measures are secured in the draft DCO. Further embedded mitigation measures for vessels are outlined in **Chapter 14 Shipping and Navigation**.
Spirit Energy	2nd June 2023	Spirit has identified considerations to facilitate coexistence given the proximity of the windfarm site to operations. This includes shared minimum requirements that must be given consideration prior to finalising development plans and that further studies will be required to determine impact on the Radar Early Warning System, marine movements, and aviation. Communications, Radar Early Warning System effectiveness is frequently negatively impaired by	The location of the Project windfarm site was selected with coordination and co-existence with other activities, developers and operators in mind. The Applicant has been in regular engagement with Spirit Energy throughout the development of the Project to date. The impacts around platform helicopter access and Radar Early

Consultee	Date	Comment	Response/where addressed in the ES
		the construction and placement of the wind turbines. Proximity of the wind turbines to the existing Oil and Gas infrastructure impairs the efficiency and functionality of the existing Radar Early Warning System for detection of vessels and warning time required by the offshore fixed installation which is a statutory requirement. Further assessment of the radar, sectors and additional means for the traffic monitoring will be required to ensure Spirit compliance with the PFEER regulations. Minimum requirements shared to date include; 1) 500m exclusion zone around all oil and gas production platforms. 2) 500m either side of pipelines/cables to inspect and repair. 3) Vessel passing distance/transit corridor of at least 1 nautical mile from each facility. 4) 1 nautical mile corridor East/West of each platform to allow Platform Supply Vessel (PSV) and Emergency Response and Rescue Vessel (ERRV) access and a 1 nautical mile corridor between Calder and CPP1. Decommissioning vessels and rigs require a minimum of 1 nautical mile corridor to access the platforms, an approach from both East and West of the CPP1 platform and a minimum of 1.5 nautical mile radius around each platform to allow to manoeuvre into position. Spirit Energy Production UK Limited has undertaken some initial work, along with Harbour Energy, the owner of the nearby Calder platform,	Warning Systems (REWS) have been further assessed since PEIR and are considered in **Section 17.6**, with in detail in **Appendix 17.1** and **Appendix 17.2**. Amendments to the windfarm site boundary have been made since PEIR which means that the Calder platform now lies outside of the windfarm site. The Calder platform is 0.9km (ca. 0.5nm) from the western boundary of the windfarm site and 1.5nm from the Morecambe Unconstrained Areas (areas where WTGs or OSPs can be located, as per embedded mitigation set out in **Section 17.3.3**) as secured in the draft DCO. The South Morecambe Central Processing Complex (CPC) is 1.6km (ca.0.9nm) north of the windfarm site and 1.5nm from the Morecambe Unconstrained Areas. As the Calder platform no longer sits within the windfarm site, there is now unobstructed access between Calder and the CPP1 platform. Embedded mitigation set out in **Section 17.3.3** includes that WTG and OSPs would be separated from oil and gas platforms with a helideck by a 1.5nm radius buffer zone, and WTGs/OSPs would not be placed

Consultee	Date	Comment	Response/where addressed in the ES
		and it has been determined that there is a requirement for a minimum of 3.3 nautical mile radius of unobstructed airspace around each offshore facility/platform to ensure safe helicopter operations. Each facility/platform will also require a straight unobstructed 2 nautical mile wide corridor oriented into prevailing wind and extending from the centre of the facility/platform to a distance of 7 nautical miles. Spirit is required to undertake helicopter operations between the CPP1 platform and the nearby Normally Unmanned Installations to maintain operations on a daily basis requiring flights to operate in all environmental conditions and at all times between onshore heliport and the offshore installations, and flights between offshore installations. Further work will be required by OWL, Spirit and Harbour Energy to determine airspace requirements to ensure safe Morecambe Hub asset operations and future decommissioning aviation requirements and whether these can be upheld with the introduction of obstacles in the area of the OWL windfarm array.	within 500m of existing pipelines and cables unless agreed otherwise. These measures are secured in the draft DCO. Further embedded mitigation measures for vessels are outlined in **Chapter 14 Shipping and Navigation**. The impacts around gas platform access are assessed in **Section 17.6** and in **Appendix 17.1**. The Helicopter Access Study (**Appendix 17.1**) shows that future CAT access to the Calder and South Morecambe (CPC-1/DP1) platforms would be restricted to day VMC by the presence of WTGs. Whilst this would be a logistical impact on the operator, SAR access would remain unaffected, as identified in **Appendix 17.1**. Engagement is ongoing with Spirit Energy on the terms of a suitable cooperation and coexistence agreement, with protective provisions which make provision for additional costs if required included in the draft DCO for completeness (these are not expected to be required in the current form in addition to the cooperation agreement). An ERCoP would be drafted post-consent, and the Applicant will liaise

Consultee	Date	Comment	Response/where addressed in the ES
			on these matters with other operators in the region including Spirit Energy.
Ministry Of Defence (MOD) ref DIO10054567	21st June2023	The use of airspace in the vicinity of the proposed development for defence purposes has been appropriately identified and considered, the requirement to supply sufficient information to allow accurate charting of the development and for the installation of appropriate aviation safety lighting is addressed in section 16.3.3.3 Marking and Lighting. The mandatory requirements set out in Civil Aviation Authority publication CAP 393 for aviation safety lighting are specifically referenced.	Noted. Effects on MOD activities are assessed in **Section 17.6.1.6** and **Section 17.6.2.6**.
	21st June2023	An assessment of the location of the offshore element of the development has confirmed that the proposed development area does not overlap with any military danger areas or Practice and Exercise Areas (PEXA). We do not therefore anticipate there to be any concerns relating to military maritime activities.	Noted. Effects on MOD activities are assessed in **Section 17.6.1.6** and **Section 17.6.2.6**.
Barrow OWF West of Duddon Sands OWF Burbo Bank OWF	2nd June 2023	Given the proximity a number of items have been raised by developers of existing offshore windfarms in proximity including impacts to: ▪ Energy yield/wake effects ▪ Shipping and Navigation ▪ Physical interaction of projects ▪ Helicopter activity ▪ Emergency response	The Applicant has engaged with the developers of operational windfarms (Ørsted and Scottish Power Renewables), noting the items raised and would maintain engagement moving forward. It is noted that the existing windfarms would be considered when further developing radar mitigation (see

Consultee	Date	Comment	Response/where addressed in the ES
Burbo Bank extension OWF		▪ Radar mitigation	**Chapter 16 Civil and Military Aviation and Radar**) as well as in navigation plans (see **Chapter 14 Shipping and Navigation**) that would be agreed post-consent, noting that a decision on construction and operation and maintenance Port(s) would be made post-consent. Further information is provided in **Chapter 5 Project Description** (Document Reference 5.1.5) regarding estimated helicopter movements. Wake effects are also considered in **Section 17.6**.
Walney 1, 2, 3 and 4 OWFs			
Isle of Man OWF (Mooir Vannin OWF)	2nd June 2023	Ørsted has the benefit of an Agreement for Lease granted by the Isle of Man Government in 2015 and has conducted a number of environmental surveys and technical studies within the Isle of Mans Territorial Seas off the east coast to determine the feasibility of developing an offshore wind farm. These studies have determined the feasibility of the site. Ørsted has progressed development and is currently working towards submitting a scoping report in September or October 2023, with an Application for Marine Infrastructure Consent currently anticipated to be made in Q1 2025. Any interactions and impact should be considered long-term and the various project stages of construction, operation, maintenance and decommissioning of the Isle of Man Offshore Windfarm should be considered by you. It is	The submission by Ørsted of the Mooir Vannin OWF Scoping Report in October 2023 is noted. The Mooir Vannin OWF has been considered within this ES (cumulative assessment) where there is a potential pathway for effects. The assessments are considered to appropriately reflect the information available for the Mooir Vannin OWF project and the distance afforded between the projects (limiting interactions).

Consultee	Date	Comment	Response/where addressed in the ES
		important to ensure that all environmental impacts of your project are properly and fully assessed including any potential cumulative or in combination effects with the Isle of Man Offshore Windfarm. We refer you to our response to the Morgan Offshore Wind Project which outlines our concerns as to the approach taken to the in-combination and cumulative assessments to date.	
Havhingsten Cable System Consortia, Virgin Media and O2	2nd June 2023	Cable operators expects the project to follow the respective European Subsea Cables Association (ESCA) and International Cable Protection Committee (ICPC) recommendations on proximity to cables.	The Applicant confirms the guidance would be adhered to in the final layout of infrastructure within the windfarm site. Embedded mitigation measures are set out in **Section 17.3.3** and also secured as part of protective provisions in the draft DCO as required.

17.3 Scope

17.3.1 Study area

17.12 Activities associated with infrastructure and other users that have the potential to overlap, influence or be influenced by the Project have been identified. Direct overlap of Project infrastructure is limited to the windfarm site (encompassing all Project infrastructure). The study area has been then extended to 50km, using expert judgement of the ZoI for other indirect effects, and allows for potential interaction of Project activities with a wide range of other users, both offshore and onshore. This study area exceeds the 9nm helicopter consultation zone. The study area is shown in **Figure 17.1**.

17.3.2 Realistic worse-case scenarios

17.13 The final design of the Project would be confirmed through detailed engineering design studies that would be undertaken post-consent, and pursuant to DCO conditions and requirements to enable the commencement of construction. To provide a precautionary but robust impact assessment at this stage of the development process, realistic worst-case scenarios have been defined. The realistic worst-case scenario (having the most impact) for each individual impact is derived from the Project Design Envelope (PDE) to ensure that all other design scenarios would have less or the same impact. Further details are provided in **Chapter 6 EIA Methodology**. This approach is common practice for developments of this nature, as set out in PINS Advice Note Nine: Rochdale Envelope (PINS, 2018).

17.14 The realistic worst-case scenarios for the assessment for infrastructure and other users are summarised in **Table 17.2**~~**Table 17.2**~~. These are based on the Project parameters described in **Chapter 5 Project Description**, which also provides further details regarding specific activities and their durations. The PDE presented has been refined as much as possible between PEIR and ES, presenting a project description with design flexibility only where it is needed.

Table 17.2 Realistic worst-case scenarios for infrastructure and other users

Impact	Worst-case scenario	Notes and rationale
Construction phase		
Impact 1: Potential effects on or arising from other windfarms or renewable developments Impact 2: Potential effects on or arising from oil and gas infrastructure and future exploration Impact 3: Physical effect on subsea cables and pipelines Impact 4: Potential effects on disposal and aggregates site Impact 5: Potential effect on tourism and recreation Impact 6: Potential effects on MOD activities	**Seabed preparation area for WTGs, OSP(s) and jack-up vessels:** ▪ 35 x WTGs with GBS foundations (including jack-up vessel footprint) = 303,625m^2 ▪ Two x OSPs with GBS foundations (including jack-up vessel footprint) = 17,350m^2 ▪ Anchoring for 35 WTGs and two OSPs = 26,640m^2 **Disturbance footprint for inter-array and platform link cable installation:** ▪ Inter-array cables = 1,750,000m^2 ▪ Platform link cables = 250,000m^2 **Maximum spatial footprint of disturbance (sum of above):** ▪ 2,347,615m^2 (approximately 2.4km^2) and an associated 1.1million m^3 of sediment displaced **Expected construction timeline:** ▪ Duration of offshore construction: 2.5 years **Vessel movements:** ▪ Maximum number of construction vessels on site at any one time: **37**	The worst-case scenario represents the construction activities which would create the maximum disruption for the longest period. This includes activities which could adversely affect the activities of infrastructure and other users, through: ▪ Overlapping other projects (area covered by the windfarm site) ▪ Disruption to services (e.g. transit routes) affecting safety (navigation and buffer zones around structures) ▪ Potential adverse effect of structure construction (WTGs, OSPs and foundations) ▪ Inter-array cable excavation ▪ Cable and pipeline crossings ▪ Disturbance of the seabed resulting in an increase in suspended sediments

Impact	Worst-case scenario	Notes and rationale
	▪ Maximum number of return trips for vessels per year (in a peak year): **2,583** **Helicopters** ▪ It is estimated that a total number of 800 helicopter return trips would be needed over the construction period. **Proximity:** WTGs and OSP(s) would be constructed at a minimum distance of: ▪ 500m from oil or gas platforms ▪ 500m either side of pipelines and umbilicals ▪ 1.5 nautical miles (nm) from active helidecks (1.5nm buffer zone) ▪ 500m either side of any existing 3rd party cables (including telecommunication and power cables) **Safety Zones:** ▪ 500m radius from any Project construction activity above or below water ▪ 50m Safety Zone would be applied for around partially completed Project structures or complete Project structures undergoing commissioning	

Impact	Worst-case scenario	Notes and rationale
Operation and maintenance phase		
Impact 1: Potential effects on or arising from other windfarms or renewable developments Impact 2: Potential effects on or arising from oil and gas infrastructure and future exploration Impact 3: Physical effect on subsea cables and pipelines Impact 4: Potential effects on disposal and aggregates site Impact 5: Potential effect on tourism and recreation Impact 6: Potential effects on MOD activities	**Windfarm site area**: 87km^2 **Project infrastructure footprint** = 514,081m^2 (approximately 0.51km^2), including: ▪ 35 x GBS WTGs with scour protection = 248,080m^2 ▪ Two GBS OSPs with scour protection = 14,176m^2 ▪ Inter-array cable protection due to ground conditions = 91,000m^2 ▪ Platform link cable protection due to ground conditions = 13,000m^2 ▪ Cable protection at entry to WTGs/OSPs = 45,500m^2 ▪ 9 x inter-array cable crossings = 40,050m^2 ▪ 6 x platform link cable crossings = 26,700m^2 ▪ Replacement scour protection and cable protection material = 35,575m^2 **Maximum temporal footprint:** The operational lifetime of Project is expected to be 35 years. **Vessel movements:** Maximum number of operation vessels on site at any one time: ▪ Three vessels during a standard year	This scenario represents the greatest potential disruption to infrastructure and other users during operational and maintenance activities including: ▪ Footprint of the Project structures ▪ Maintenance and repair vessel activity and anchoring ▪ Use of port services ▪ Crossings and proximity of cables and pipelines during operation and maintenance

Impact	Worst-case scenario	Notes and rationale
	▪ 10 vessels during a 'heavy maintenance' year (expected to be every fifth year), as described further in **Chapter 5 Project Description** Maximum number of vessel return trips from windfarm site to port per year: ▪ 384 vessels during a standard year ▪ 832 vessels during a 'heavy maintenance' year **Proximity:** Project infrastructure would be located at a minimum distance of: ▪ 500m from operational oil or gas platforms ▪ 500m either side of pipelines and umbilicals ▪ 1.5nm from oil or gas platforms with active helidecks ▪ 500m either side of any existing 3rd party cables (including telecommunication and power cables) **Safety Zones:** There would be Safety Zones of 500m radius from any major maintenance activity. **WTG spacing:** A minimum separation distance of 1,060m has been defined between adjacent WTGs within the same main row, and 1,410m between each main row.	

Impact	Worst-case scenario	Notes and rationale
Decommissioning phase		
Impact 1: Potential effects on or arising from other windfarms or renewable developments	The decommissioning policy for the Project infrastructure is not yet defined, however it is anticipated that structures above the seabed would be removed. The following infrastructure is likely to be removed reused, or recycled where practicable: WTGs and foundations ▪ OSP(s) including topsides and foundations The following infrastructure is likely to be decommissioned and could be left in situ depending on available information at the time of decommissioning: ▪ Inter array and platform link cables ▪ Scour protection ▪ Crossings and cable protection ▪ Part of the foundations (e.g. some foundation material below the seabed may be left in situ)	The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time. Decommissioning arrangements would be detailed in a Decommissioning Programme, which would be drawn up and agreed with the relevant authority at the time, prior to decommissioning. For the purposes of the worst-case scenario, it is anticipated that the impacts would be comparable to those identified for the construction phase.
Impact 2: Potential effects on or arising from oil and gas infrastructure and future exploration		
Impact 3: Physical effect on subsea cables and pipelines		
Impact 4: Potential effects on disposal and aggregates site		
Impact 5: Potential effect on tourism and recreation		
Impact 6: Potential effects on MOD activities		

17.3.3 Summary of mitigation embedded in the design

17.15 Site selection has been undertaken to avoid many marine users and activities such as disposal sites, aggregate area and MOD PEXAs, and with co-existence in mind, as described in **Chapter 4 Site Selection and Assessment of Alternatives**. Further to this, this section outlines the embedded mitigation relevant to the infrastructure and other marine users' assessment, which has been incorporated into the design of the Project (**Table 17.3**~~**Table 17.3**~~). Mitigations identified in **Chapter 14 Shipping and Navigation** and **Chapter 16 Civil and Maritime Aviation and Radar** are also relevant. Where additional mitigation measures are proposed, these are detailed in the impact assessment (**Section 17.6**).

17.16 Given the existing marine infrastructure within and surrounding the windfarm site the embedded mitigation includes physical separation appropriate to the type of infrastructure present, which would be incorporated in the development of the Project design and WTG layout. Unconstrained Areas have been defined as where OSP(s) and WTGs could be placed within the windfarm site, accounting for separation between oil and gas platforms, cables, umbilicals and pipelines, used when developing layout scenarios within the windfarm site and secured in the DCO by Protective Provisions. Engagement with operators of the marine infrastructure in the study area would continue (noting the layout would be agreed post-consent) and further information on the design process is provided in **Chapter 4 Site Selection and Assessment of Alternatives**.

Table 17.3 Embedded mitigation measures

Parameter	Mitigation measures embedded into the design of the Project
Promulgation of information	Advance warning and accurate location details of construction, maintenance and decommissioning operations, associated safety zones and advisory passing distances would be given via Notice to Mariners (NtMs) and Kingfisher Bulletins and other appropriate media, including charting. Construction, operation and maintenance, and decommissioning activity would be communicated using NtM and via ongoing engagement, as appropriate.
Lighting and marking	Consultation with Civil Aviation Authority (CAA), Trinity House (TH) and the Maritime and Coastguard Agency (MCA) to agree appropriate lighting and marking taking into consideration existing oil and gas assets.
Emergency response	Alignment of WTGs as required under Marine Guidance Note (MGN) 654 (MCA, 2021) to provide obstruction free Search and Rescue (SAR) access,

Parameter	Mitigation measures embedded into the design of the Project
	including two lines of orientation unless otherwise agreed. An Emergency Response and Cooperation Plan (ERCoP) would be agreed and implemented for all phases of the Project. The SAR requirements would be agreed with the Marine Management Organisation (MMO) in consultation with the MCA post-consent in line with regulatory requirements.
Layout - WTGs and OSP(s) separation from oil and gas platforms	WTGs and OSP(s) would be separated by a 1.5nm radius buffer zone from oil and gas platforms with an active helicopter deck (and 500m from oil and gas platforms without a helideck). Windfarm site areas beyond the 1.5nm buffer zone are defined as the 'Unconstrained Areas' (i.e where WTGs/OPSs can be located) (protective provisions are included in the draft DCO).
Layout - WTGs and OSP(s) separation from cables and pipelines	European Subsea Cables Association Guideline No. 6 recommends that clearance to telecoms cables is to be agreed between the windfarm developer and the existing subsea infrastructure owner. WTGs and OSP(s) would not be placed within 500m either side of cables unless agreed otherwise. WTGs and OSP(s) would not be placed within 500m either side of pipelines or umbilicals associated with oil and gas infrastructure. Separation from existing 3rd party cables and pipelines are accounted for when defining the Unconstrained Areas where WTGs and OSP(s) could be placed (protective provisions are included the draft DCO).
Pre-construction surveys	Pre-construction surveys would be implemented by the Applicant in order to identify any potential hazards within the windfarm site. These would include geophysical surveys to identify seabed hazards such as discarded fishing gear, wrecks or unidentified objects and magnetometer surveys to identify for the presence of UXO devices. Any identified UXO devices would be avoided through micrositing or require a subsequent UXO clearance campaign which would be subject to separate consent.
Cables	Where practical the layout would minimise the number of cable crossings of existing third-party infrastructure. All cables would be installed and maintained in line with standard industry guidance and good practice. Subsea Cables UK Guidelines and International Cable Protection Committee Recommendations

Parameter	Mitigation measures embedded into the design of the Project
	provide guidance on proximity of cables to existing assets and coordination with other operators. Crossing and proximity agreements would be agreed post-consent with the relevant asset owners in accordance with relevant guidance.
Safety Zones	The following Safety Zones would be applied for by the Project following consultation: ▪ 500m safety zones around any structure where construction or decommissioning work is underwater, as indicated by the presence of large construction vessel(s) ▪ 50m safety zones around any partially completed structure during the construction phase where work is not underway ▪ 500m safety zones around any structures undergoing major maintenance during the operational phase, defined as work requiring a large or Restricted in the Ability to Manoeuvre vessel

17.4 Impact assessment methodology

17.4.1 Policy, legislation and guidance

17.4.1.1 National Policy Statements

17.17 The assessment of potential effects on infrastructure and other users has been made with specific reference to the relevant NPS. These are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIPs). Those relevant to the Project are:

- Overarching NPS for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2023a)
- NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b)

17.18 The specific assessment requirements for infrastructure and other users as detailed in the NPS, are summarised in **Table 17.4**~~**Table 17.4**~~ together with an indication of the section of the ES chapter where each is addressed.

Table 17.4 NPS assessment requirements

NPS requirement	NPS reference	ES reference
NPS for Renewable Energy Infrastructure (EN-3)		
Proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence/co-location with other marine and terrestrial uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage.	Paragraph 2.5.2	In relation to other marine users co-existence (and co-operation) the Project has incorporated mitigations into the design, including: ▪ Re-using a previously developed site (working around a decommissioned platform, capped wells, and decommissioned linear infrastructure) ▪ Carefully refined boundary to minimise impacts on commercial shipping, and avoids restricting alternative shipping routes which may be necessitated by other Round 4 projects ▪ Proximity 'buffers' committed to in respect of other existing infrastructure which is not yet decommissioned through Protective Provisions in the dDCO, including telecoms, pipelines and oil and gas infrastructure, with co-existence agreements being pursued. ▪ Commitment in the DCO to release any environmental 'headroom' when the design is finalised, maximising opportunities for future projects ▪ Coordination of transmission infrastructure with other Round 4 projects ▪ Commitment to a Fisheries co-existence and liaison plan including justifiable disturbance payments during construction where justified

NPS requirement	NPS reference	ES reference
There may be constraints imposed on the siting or design of offshore wind farms because of the presence of other offshore infrastructure, such as co-existence/co-location, oil and gas, Carbon Capture, Usage and Storage (CCUS), co-location of electrolysers for hydrogen production, marine aggregate dredging, telecommunications, or activities, such as aviation and recreation.	Paragraph 2.8.44	Operators within the vicinity of the Project were consulted in the pre-application phase (Table 17.1~~Table 17.1~~). This has formed a key part of consultation as the location of the Project windfarm site was selected with coordination and coexistence with other activities, developers and operators in mind. For example, the Applicant has been engaging with Spirit Energy and Harbour Energy since 2019. **Chapter 4 Site Selection and Assessment of Alternatives** provides the rationale for the location of the windfarm site which included consideration of constraints associated with other offshore infrastructure and users. Embedded mitigation in **Section 17.3.3** highlights measures integrated into the design due to existing infrastructure. Further engagement would continue as designs are developed, with requirements and protective provisions included in the draft DCO as required.
Given the scale of offshore wind deployment required to meet 2030 and 2050 ambitions, and the importance of the UK Continental Shelf (UKCS) in supporting progress towards net zero commitments there will be increasing demand on the UKCS which could give rise to conflicts. The occurrence of conflict between offshore development projects in the short term could restrict the capacity of the UKCS to support the variety of technologies required for the delivery of net zero.	Paragraph 2.8.45	Coordination and coexistence with other users is built into the Project objectives (Planning Development Consent and Need Statement, Document Reference 4.8). **Chapter 4 Site Selection and Assessment of Alternatives** provides the rationale for the location of the windfarm site which included consideration of constraints associated with other offshore infrastructure and users. Relevant stakeholders, including operators in vicinity of the Project have been, and will continue to be consulted throughout the application process (Table 17.1~~Table 17.1~~). Effects on other operators as a result of the Project are assessed in **Section 17.6** and **Section 17.7**.

NPS requirement	NPS reference	ES reference
Applicants should consult the government's Marine Plans (further detailed in Section 4.5 of EN-1) which are a useful information source of existing and known or potential activities and infrastructure.	Paragraph 2.8.46	North West Inshore and North West Offshore Marine Plan have been consulted for this assessment (**Section 17.4.2**).
Prior to the submission of an application involving the development of the seabed, applicants should engage with key stakeholders, such as The Crown Estate and statutory bodies to ensure they are aware of any current or emerging interests on or underneath the seabed which might give rise to a conflict with a specific application. This will ensure adequate opportunity to reduce potential conflicts and increase time to find a resolution.	Paragraph 2.8.47	Consultation with The Crown Estate and the operators of offshore infrastructure and other marine users has been undertaken by the Applicant during the pre-application phase, an overview is provided in **Table 17.1**~~**Table 17.1**~~. Engagement would continue as the final Project design develops. It is noted that co-existence is vital to support the variety of industries required for the delivery of Net Zero.
Applicants are encouraged to work collaboratively with those other developers and sea users on co-existence/co-location opportunities, shared mitigation, compensation and monitoring where appropriate. Where applicable, the creation of statements of common ground between developers is recommended. Work is ongoing between government and industry to support effective collaboration and to find solutions to facilitate to greater coexistence/co-location.	Paragraph 2.8.48	

NPS requirement	NPS reference	ES reference
Detailed discussions between the applicant for the offshore wind farm and the relevant consultees should have progressed as far as reasonably possible prior to the submission of an application. As such, appropriate mitigation should be included in any application, and ideally agreed between relevant parties. In such circumstances, the Secretary of State should expect the applicant to work with the impacted sector to minimise negative impacts and reduce risks to as low as reasonably practicable.	Paragraphs 2.8.261-262	Consultation with the operators of offshore infrastructure and other marine users has been undertaken by the Applicant throughout the pre-application phase, an overview is provided in Table 17.1~~Table 17.1~~. Further engagement would continue as designs are developed, with requirements and protective provisions included in the draft DCO as required. Embedded mitigation adopted by the Project is set out in **Section 17.3.3** and additional mitigation identified in **Section 17.6**.
Where a potential offshore wind farm is proposed close to existing operational offshore infrastructure or has the potential to affect activities for which a licence has been issued by government, the applicant should undertake an assessment of the potential effects of the proposed development on such existing or permitted infrastructure or activities. The assessment should be undertaken for all stages of the lifespan of the proposed wind farm in accordance with the appropriate policy and guidance for offshore wind farm EIAs.	Paragraph 2.8.197 – 2.8.198	The impact assessment is provided in **Section 17.6** of this chapter. Associated assessments are further described in **Chapter 14 Shipping and Navigation, Appendix 14.1 Navigation Risk Assessment** (Document Reference 5.2.14.1) and **Chapter 16 Civil and Military Aviation and Radar.**
Applicants should engage with interested parties in the potentially affected offshore sectors early in the pre-application phase of the proposed offshore wind farm, with an aim to resolve as many issues as possible prior to the submission of an application. Such stakeholder engagement should continue throughout the life of the development including construction, operation and decommissioning phases where necessary.	Paragraph 2.8.200 - 2.8.203	Coordination and coexistence with other users is built into the Project objectives (Planning Development Consent and Need Statement, Document Reference 4.8). Consultation with the operators of offshore infrastructure has been undertaken by the Applicant, an overview is provided in Table 17.1~~Table 17.1~~. Applicant has progressed effective co-existence solutions. Further engagement would continue as designs are

NPS requirement	NPS reference	ES reference
As many offshore industries are regulated by government, the relevant Secretary of State should also be a consultee where necessary. Such engagement should be taken to ensure that solutions are sought that allow offshore wind farms and other uses of the sea to co-exist successfully.		developed, with requirements and protective provisions included in the draft DCO as required.
Where a proposed offshore wind farm potentially affects other offshore infrastructure or activity, a pragmatic approach should be employed by the Secretary of State. Much of this infrastructure is important to other offshore industries as is its contribution to the UK economy. In such circumstances, the Secretary of State should expect the applicant to work with the impacted sector to minimise negative impacts and reduce risks to as low as reasonably practicable. As such, the Secretary of State should be satisfied that the site selection and site design of a proposed offshore wind farm and offshore transmission has been made with a view to avoiding or minimising disruption or economic loss or any adverse effect on safety to other offshore industries. Applicants will be required to demonstrate that risks to safety will be reduced to as low as reasonably practicable.	Paragraphs 2.8.342-348	Coordination and coexistence with other users is built into the Project objectives (Planning Development Consent and Need Statement, Document Reference 4.8). **Chapter 4 Site Selection and Assessment of Alternatives** provides the rationale for the location of the windfarm site which included consideration of constraints associated with other offshore infrastructure and users, and considered potential grid connection locations. Effects on other marine users and oil and gas operators as a result of the Project are assessed in **Section 17.6** and **Section 17.7**. Safety risks regarding shipping and navigation are assessed via the Navigational Risk Assessment (**Chapter 14 Shipping and Navigation** and **Appendix 14.1 and 14.2 Cumulative Regional Navigational Risk Assessment**) and aviation and radar is assessed in **Chapter 16 Civil and Military Aviation and Radar**. Consultation has been undertaken by the Applicant throughout the pre-application phase, an overview is provided in **Table 17.1~~Table 17.1~~**. Applicant has progressed effective co-existence solutions and engagement would

NPS requirement	NPS reference	ES reference
The Secretary of State should not consent applications which pose intolerable risks to safety after mitigation measures have been considered. Where a proposed development is likely to affect the future viability or safety of an existing or approved/licensed offshore infrastructure or activity, the Secretary of State should give these adverse effects substantial weight in its decision-making. Providing proposed schemes have been carefully designed, and that the necessary consultation with relevant bodies and stakeholders has been undertaken at an early stage, mitigation measures may be possible to negate or reduce effects on other offshore infrastructure or operations to a level sufficient to enable the Secretary of State to grant consent.		continue as the final Project design develops and throughout all development phases of the Project, as required.
Overarching NPS for Energy (EN-1)		
The historical approach to connecting offshore wind resulted in individual radial connections developed project-by-project. While this may continue to be the most appropriate approach for some areas with single offshore wind projects that are not located in the proximity of other offshore wind infrastructure, it is expected that for regions with multiple windfarms a more coordinated approach will be delivered. For these areas, this approach is likely to reduce the network infrastructure costs as well as the cumulative environmental impacts and impacts on coastal communities by installing a smaller number of larger connections, each taking power from	Paragraph 3.3.71	In line with this requirement, the Transmission Assets associated with the Project are being developed in coordination with the transmission infrastructure for the Morgan Offshore Wind Project as part of a separate DCO application, as described in **Chapter 1 Introduction.**

NPS requirement	NPS reference	ES reference
multiple windfarms instead of individual point-to-point connections for each windfarm.'		
It is important that new energy infrastructure does not unacceptably impede or compromise the safe and effective use of any defence assets. The joint industry and government Air Defence and Offshore Wind Mitigation Task Force was set up to enable the co-existence of UK Air Defence and offshore wind. The Strategy and Implementation Plan sets the direction for that collaboration. The recommendations generated from this Task Force should be referred to by both defence and energy stakeholders.	Paragraph 5.5.35 - 5.5.36	The potential impacts of the Project on MOD assets and activities are considered in **Section 17.5.5, 17.6** and further in **Chapter 16 Civil and Military Aviation and Radar**. Consultation with the MOD has been undertaken by the Applicant, an overview is provided in **Table 17.1**~~**Table 17.1**~~. The Applicant has progressed effective co-existence solutions and engagement would continue as the final Project design develops and throughout all development phases of the Project, as required.

17.4.1.2 Additional relevant policy, legislation and guidance

17.19 In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of infrastructure and other users. These include:

- ESCA Guideline No. 6 – The Proximity of Offshore Renewable Energy Installations and Submarine Cable Infrastructure in UK Waters (ESCA, 2016)
- Offshore renewables energy installations: applying for safety zones (Department of Energy and Climate Change (DECC), 2004)
- The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007
- The ICPC has issued a series of recommendations for marine cables, specifically:
    - Recommendations No. 2 – Recommended Routing and Reporting Criteria for Cables in Proximity to Others (ICPC, 2021)
    - Recommendations No. 3 – Criteria to be Applied to Proposed Crossings Submarine Cables and/or Pipelines (ICPC, 2021)
    - Recommendations No. 13 – The Proximity of Offshore Renewable Wind Energy Installations and Submarine Cable Infrastructure in National Waters (ICPC, 2021)
- Oil and Gas UK – Pipelines Crossing Agreement and Proximity Agreement Pack (Oil and Gas UK, 2015)
- Round 4 Resource and Constraints Assessment for Offshore Wind (The Crown Estate, 2018)
- North West Inshore and North West Offshore Marine Plan (Department for Environment, Food and Rural Affairs (Defra, 2021)
- The Royal Yaching Association (RYA) position on offshore renewable energy developments: Paper 1 (of 4) – Wind Energy, June 2019 (RYA, 2019a).
- Cumbria Local Enterprise Partnership (2022) Clean Energy Strategy
- Civil Aviation Authority (2016) Civil Aviation Publication (CAP) 764: Policy and Guidelines on Wind Turbines
- Civil Aviation Authority (2018) Guidance for specific approval for helicopter offshore operations (SPA-HOFO)

- Civil Aviation Authority (2023) CAP 437: Standards for offshore helicopter landing areas
- Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs)
- The United Nations Convention on the Law of the Sea (UNCLOS) (United Nations, 1982)
- UK Government 2016 - The Air Navigation Order

17.20 Further information on overarching policy is provided in **Chapter 3 Policy and Legislation** (Document Reference 5.1.3).

17.4.2 Data and information sources

17.21 The data sources that have been used to inform the assessment are listed in **Table 17.5**~~**Table 17.5**~~. Data is supported by consultation with relevant stakeholders (**Table 17.1**~~**Table 17.1**~~) ensuring that data relied upon remains up to date.

Table 17.5 Existing data sources used in this chapter

Data type	Date	Data source
Offshore Wind	2021	The Crown Estate: Offshore Wind Leasing Round 4 Characterisation Areas (England, Wales and Northern Ireland). The Crown Estate (2022), Offshore wind electricity map
Marine Disposal Sites	2022	UK Disposal Site Layer, Centre for Environment, Fisheries and Aquaculture Science (Cefas)
Dredger Transit Routes	2022	Dredger Transit Route Charts for Renewable Energy & Cables, The British Marine Aggregate Producers Association (BMAPA)
MOD PEXA areas	2020	UK Hydrographic Office (2020). MOD PEXA areas. Online Mapping Tool
Munition Dumping Grounds	2023	European Marine Observation and Data Network (EMODnet) Dumped Munitions (Points) Human Activities project
CCS	2023	The Crown Estate Offshore Activity North Sea Transition Authority (NSTA) Offshore Oil and Gas Activity interactive maps and tools
Aggregate sites	2023	The Crown Estate Open Data

Data type	Date	Data source
Offshore cables	2023	Kingfisher Information Service - Offshore Renewables and Cable Awareness (KIS-ORCA), publicly available data Marine data from MarineFIND
Oil and gas infrastructure	2024	NSTA interactive maps and tools
Recreational boating	2019	UK Coastal Atlas of Recreational Boating (RYA, 2019b)
Angling	2014 and 2020	Mapping recreational sea anglers in English waters. A report produced for the MMO (MMO, 2014 and 2020)
Recreational activities - scuba diving	2014	This MMO model output illustrates the potential for scuba diving activity in English waters as part of: Modelling marine recreation potential in England (MMO, 2014).

17.4.2.1 Other available sources

17.22 Given the interconnected nature of the Project and the Morgan and Morecambe Offshore Wind Farms Transmission Assets project, the environmental information for the Transmission Assets PEIR has also been used to inform this chapter (Morgan Offshore Wind Limited and Morecambe Offshore Windfarm Ltd, 2023).

17.4.3 Impact assessment methodology

17.23 **Chapter 6 EIA Methodology** provides a summary of the general impact assessment methodology applied to the Project. The following sections confirm the methodology used to assess the potential effects on infrastructure and other users.

17.24 The assessment of impacts on the infrastructure and other users uses the Source-Pathway-Receptor (S-P-R) conceptual model, establishing potential for overlaps, interactions and the consequential potential for conflict between activities in both a geographical and temporal context. Information on infrastructure and other users within the study area has been obtained through publicly available literature and data sources (e.g., information in an EIA or Scoping Report) and/or through consultation with the relevant operator of the asset or activity as discussed in **Section 17.2**.

17.25 The following key terms have been used in this assessment:

- **Impact –** used to describe a change via the Project (i.e., increased vessel activity, implementations of safety zones etc.)

- **Receptor –** used to define the industry or infrastructure being exposed to the Impact (i.e., offshore wind infrastructure, sub-sea cables etc.)
- **Effect –** the consequence of an Impact combining with a Receptor, defined in terms of Significance (exact significance dependant on magnitude of impact and the sensitivity/value of the receptor)
- **Adverse effect –** an alteration of the existing environment with negative implications for the affected receptor
- **Beneficial effect** – an alteration of the existing environment with positive implications for the affected receptor

17.4.3.1 Definitions of sensitivity/value and magnitude

17.26 For each impact, the assessment identifies receptors sensitive to that impact and implements a systematic approach to understanding the impact pathways and the level of effects on given receptors.

17.27 The sensitivity (capacity to accommodate change) or value (scale of importance) of the receptor for each effect are characterised as one of four levels, high, medium, low or negligible. The definitions of receptor sensitivity (or value) for the purpose of the infrastructure and other users assessment are provided in **Table 17.6~~Table 17.6~~**.

Table 17.6 Definitions of sensitivity/value

Sensitivity/value	Definition
High	High value activity/activity fundamental to the operator or infrastructure that is of international or national economic importance and has no or very limited capacity to accommodate the predicted change or interaction. For example, gas pipeline, electrical infrastructure or telecommunication cable supporting UK or European activity or nationally important aggregates area where extraction company has no access to areas of equal quality aggregate.
Medium	Medium value activity. Activity/receptor is of regional importance and has limited capacity to accommodate the predicted change or interaction. For example, aggregates areas where extraction company has some, but limited access to equal quality aggregate.
Low	Low value activity. Activity/receptor is of local importance (e.g. infrastructure or assets/developments) and has capacity to accommodate the predicted change or interaction. For example, aggregates area where extraction company has access to large area of equal quality aggregate.
Negligible	Low value activity. Activity/receptor is not considered to be of any importance and is capable of accommodating the predicted change or interaction. Limited effect to asset owners or local community in case of damage or failure.

17.28 The magnitude of impacts has been considered in terms of the spatial extent, duration, frequency and likelihood and timing of the impact in question. The magnitude definitions used to guide the assessment for infrastructure and other users are provided in **Table 17.7~~Table 17.7~~**.

Table 17.7 Definitions of magnitude

Magnitude	Definition
High	Fundamental, permanent/irreversible changes, over the whole receptor, and/or fundamental alteration to key characteristics, function or features of the particular receptor
Medium	Considerable, permanent/irreversible changes, over the majority of the receptor, and/or discernible alteration to key characteristics, functions or features of the particular receptor
Low	Discernible, temporary (for part of the project duration) change, over a minority of the receptor, and/or limited but discernible alteration to key characteristics, functions or features of the particular receptors
Negligible	No discernible change, or barely discernible change for any length of time, over a small area of the receptor, and/or slight alteration to key characteristics, functions or features of the particular receptor.

17.4.3.2 Effect significance

17.29 The potential significance of effect for a given impact, is a function of the sensitivity/value of the receptor and the magnitude of the impact (see **Chapter 6 EIA Methodology** for further details). A matrix is used (**Table 17.8~~Table 17.8~~**) as a framework to determine the significance of an effect. Definitions of each level of significance are provided in **Table 17.9~~Table 17.9~~**. Impacts and effects may be deemed as being either positive (beneficial) or negative (adverse).

17.30 It is important that the matrix (and indeed the definitions of sensitivity/value and magnitude) is seen as a framework to aid understanding of how a judgement has been reached from the narrative of each effect assessment and it is not a prescriptive formulaic method.

17.31 Potential effects are described followed by a statement of whether the effect is significant in terms of the EIA regulations. Potential effects identified within the assessment as major or moderate are regarded as significant in terms of the EIA regulations. Whilst minor effects (or below) are not significant in EIA terms in their own right, it is important to distinguish these as they may contribute to significant effects cumulatively or through interactions.

17.32 Following initial assessment, if the effect does not require additional mitigation (or none is possible), the residual effect remains the same. If, however, additional mitigation is proposed, an assessment of the post-mitigation residual effect is provided.

Table 17.8 Significance of effect matrix

Sensitivity	Adverse Magnitude				Beneficial Magnitude			
	High	Medium	Low	Negligible	Negligible	Low	Medium	High
High	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
Medium	Major	Moderate	Minor	Minor	Minor	Minor	Moderate	Major
Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

Table 17.9 Definition of effect significance

Significance	Definition
Major	Very large or large change in receptor condition, both adverse or beneficial, which are likely to be important considerations at a regional or district level because they contribute to achieving national, regional or local objectives, or could result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Intermediate change in receptor condition, which are likely to be important considerations at a local level.
Minor	Small change in receptor condition.
Negligible	No discernible change in receptor condition.
No change	No effect, therefore, no change in receptor condition.

17.4.4 Cumulative effect assessment methodology

17.33 The CEA considers other plans, projects and activities that may impact cumulatively with the Project. As part of this process, the assessment considers which of the residual effects assessed have the potential to contribute to a cumulative effect. **Chapter 6 EIA Methodology** provides further details of the general framework and approach to the CEA.

17.34 As described in **Chapter 1 Introduction**, the Transmission Assets associated with the Project are undergoing a separate consent process as part of the Morgan and Morecambe Offshore Wind Farms: Transmission Assets project. To enable impacts from the Project and the Transmission Assets to be considered together, a combined assessment is made within the cumulative assessment to identify any key interactions and additive effects (**Section 17.7**).

17.4.5 Transboundary effect assessment methodology

17.35 **Chapter 6 EIA Methodology** provides details of the general framework and approach to the assessment of transboundary effects.

17.36 For infrastructure and other users, the potential for transboundary effects were considered in the Project Scoping Report and it was concluded that the only

potential transboundary receptors are cables owned by international operators located within the study area. These have been covered in the assessments outlined below, and therefore no separate transboundary assessment is required.

17.4.6 Assumptions and limitations

17.37 Characterisation of the existing environment and the resulting impact assessment is based on publicly available information, purchased data or information gained directly from the relevant companies or organisations during consultation. There may be elements of uncertainty associated with the locations of some existing and proposed infrastructure and where this is the case, this would be discussed with the owners/operators and/or established during pre-construction surveys as necessary.

17.38 This limitation is not considered to significantly affect the certainty or reliability of the impact assessments presented in **Section 17.6**.

17.5 Existing environment

17.39 Characterisation of the existing environment is undertaken using the data sources listed in **Table 17.5**~~**Table 17.5**~~ plus any other relevant literature.

17.5.1 Offshore wind infrastructure and other renewable developments

17.40 The UK waters of the Irish Sea are a significant area of offshore power generation, and several phases of offshore wind development is ongoing under The Crown Estate's leasing rounds. **Table 17.10**~~**Table 17.10**~~ and **Figure 17.2** show offshore windfarm projects within 50km of the Project.

17.41 Within 50km other renewable projects are limited, while tidal projects in Morecambe Bay and in North Wales have the potential to be developed, no sufficiently progressed projects have been identified in the study area where there is the potential for interaction with the Project.

Table 17.10 Offshore windfarm projects within 50km of the Project

Offshore windfarm	Development phase (at the time of assessment)	Developer/owner	Generating capacity	Distance from the Project (km)
Morgan and Morecambe Offshore Wind Farms Transmission Assets	Pre-planning application	Morgan Offshore Wind Limited (a joint venture between bp Alternative Energy Investments Ltd. (bp) and Energie Baden-Württemberg AG (EnBW)), and Morecambe Offshore Windfarm Ltd (a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company), and Flotation Energy Ltd)	NA	0
Mona Offshore Wind Project	Pre-planning application	Mona Offshore Wind Ltd (a joint venture between bp Alternative Energy Investments Ltd. (bp) and Energie Baden-Württemberg AG (EnBW))	1500 megawatts (MW)	10.0
West of Duddon Sands	Active/In Operation	Ørsted and Scottish Power Renewables	389 MW	12.9
Morgan Offshore Wind Project Generation Assets	Pre-planning application	Morgan Offshore Wind Limited (a joint venture between bp Alternative Energy Investments Ltd. (bp) and Energie Baden-Württemberg AG (EnBW))	1500 MW	16.7
Walney Extension 4	Active/In Operation	Ørsted A/S and partners PKA and PFA	659 MW (including Extension 3 and 4)	18.8
Walney 1	Active/In Operation	Ørsted A/S, Scottish and Southern Electricity Networks (SSE) and OPW	183.6 MW	20.3
Barrow	Active/In Operation	Ørsted A/S	90 MW	21.0
Walney 2	Active/In Operation	Ørsted A/S, SSE and OPW	183.6 MW	22.7
Ormonde	Active/In Operation	Vattenfall and AMF	150 MW	27.0

Offshore windfarm	Development phase (at the time of assessment)	Developer/owner	Generating capacity	Distance from the Project (km)
Gwynt y Môr	Active/In Operation	Rheinisch-Westfälisches Elektrizitätswerk Aktiengesellschaft (RWE) Npower and partners	576 MW	28.9
Awel y Môr	Consented	RWE, Stadtwerke München, and Siemens Financial Services	Up to 1100 MW	28.9
Burbo Bank Extension	Active/In Operation	Ørsted A/S and partners PKA and KIRKBI A/S	258 MW	29.1
Walney Extension 3	Active/In Operation	Ørsted A/S and partners PKA and PFA	659 MW (including Extension 3 and 4)	30.7
Burbo Bank	Active/In Operation	Ørsted A/S	90 MW	33.4
North Hoyle	Active/In Operation	RWE Renewables	60 MW	36.3
Mooir Vannin	Early planning	Ørsted A/S	Undefined	43.7
Rhyl Flats	Active/In Operation	West Coast Energy and RWE	90 MW	40.0

17.42 The closest operational windfarm to the Project is West of Duddon Sands. This windfarm is operated by Ørsted and Scottish Power Renewables and is comprised of 108 fixed wind turbines with a total capacity of 389 (MW) and has been operational since 2014. The export cables for West of Duddon Sands make landfall at Heysham. The closest point of West of Duddon Sands to the Project windfarm site at 12.9km.

17.43 The second closest operational windfarm is Walney Extension 4 which is also operated by Ørsted and investors PKA and PFA (two leading Danish pension funds). Within the extension project (which includes Extensions 3 and 4) are 87 fixed wind turbines with a capacity of 659MW, and export cables also make landfall at Heysham, with the closest point of the cable to the Project windfarm site at 18.8km.

17.44 The Crown Estate Offshore Wind Leasing Round 4 made available areas of the seabed in the Irish Sea for the development of both fixed and floating offshore wind projects. Morecambe Offshore Windfarm is Project 5 of the seven gigawatts (GW) of offshore wind projects available. Other proposed Round 4 projects within the study area are:

- Morgan Offshore Wind Project (Project 6) lies 16.7km north west of the windfarm site
- Mona Offshore Wind Project (Project 4) lies c.10.0km west of the windfarm site

17.45 Morgan and Mona, when operational would have a nominal combined capacity of up to 3GW. The proposed export cables and transmission infrastructure from the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm (noting the transmission assets for Morgan and Morecambe are subject to a separate joint DCO application) come close to and adjoin the Project windfarm site.

17.46 Interactions between other windfarms and the Project relevant to Infrastructure and Other Users could arise including the following:

- Navigational safety issues
- Aviation (i.e., helicopter, radar and search and rescue operations)
- Cumulative issues relating to other users
- Overlap of infrastructure and potential interactions during construction, operation and maintenance, and decommissioning
- Increased pressure on port facilities

17.47 Issues arising from navigational safety and aviation are assessed in **Chapter 14 Shipping and Navigation** and **Chapter 16 Civil and Military Aviation and Radar**, respectively.

17.5.2 Oil and gas infrastructure

17.5.2.1 Existing oil and gas infrastructure

17.48 A key consideration in the selection of the windfarm site was its location in an area of seabed previously developed for oil and gas production and the opportunity to co-exist with existing oil and gas operations as described in **Chapter 4 Site Selection and Assessment of Alternatives**. This area of the Irish Sea supports significant oil and gas production and extraction facilities, with a number of active oil and gas fields present in the region as shown in **Figure 17.3**. By placing the Project infrastructure within the vicinity of existing mature oil and gas field infrastructure, the objective was to minimise the disturbance of previously undeveloped areas of the Irish Sea, recognising that the gas fields in the vicinity are nearing the end of their productive life. It is noted that the South Morecambe gas field platform DP3 (charted within the windfarm site) has now been decommissioned, with the platform topsides and jacket now removed. The removal of DP3 was part of a decommissioning programme that also included the removal of the South Morecambe DP4 platform, located to the north of the windfarm site.

17.49 A combination of both operational and decommissioned oil and gas infrastructure is present within the study area. To enable the servicing and operations of these oil and gas activities, the operators utilise vessels and helicopters to transit equipment and personnel from these facilities. Potential impacts to these operations are link to assessments in **Chapter 14 Shipping and Navigation** and **Chapter 16 Civil and Military Aviation and Radar**.

17.50 The Project windfarm site overlaps with the Morecambe South gas fields (owned and operated by Spirit Energy Production UK Limited) and the Calder gas field (owned by Harbour Energy PLC and operated by Spirit Energy Production UK Limited on their behalf). These fields are supported by offshore infrastructure (platforms, pipelines, cables and wells) and onshore facilities for extracting, transporting and processing reserves.

17.51 The details of oil and gas fields present in the study area are presented in **Table 17.11**~~**Table 17.11**~~ and, for those fields that overlap the windfarms site, details of the wells within one kilometre of the windfarm site are provided in **Table 17.12**~~**Table 17.12**~~. All oil and gas infrastructure within 50km of the windfarm site are presented in **Figure 17.3**.

Table 17.11 Existing oil and gas fields within the study area (NSTA, 2024)

Field ID	Status	Distance from Project windfarm Site (km)
Calder	Producing since 1985	Overlapping the windfarm site
South Morecambe	Producing since 1984	Overlapping the windfarm site
Dalton	Production ceased	8.6
Bains	Production ceased	4.0
North Morecambe	Producing since 1999	11.5
Hamilton North	Producing since 1995	10.4
Conwy	Producing since 2016	12.7
Millom	Production ceased	18.1
Hamilton East	Production suspended	16.6
Hamilton	Producing	17.3
Rhyl	Producing since 2013	22.7
Douglas	Producing since 1996	21.7
Douglas West	Producing	23.3
Lennox	Producing since 1996	23.1

Table 17.12 Existing oil and gas well status within 1km of the windfarm site (NSTA, 2024)

ID[4]	Operator/owner	Well status[5]	Distance from windfarm site (km)
110/08a- 7	Chrysaor Resources (Irish Sea) Limited[6]	Abandoned Phase 3	Within windfarm site
110/08- 2	Gulf Oil (Great Britain) Limited	Abandoned Phase 3	Within windfarm site
110/08a-C4	Spirit Energy Production UK Limited	Abandoned Phase 2	Within windfarm site
110/08a-C3	Spirit Energy Production UK Limited	Abandoned Phase 2	Within windfarm site

[4] This ID references the associated North Sea Transition Authority (NSTA) designated licencing block that the 'well' is located within.

[5] Abandoned Phase 1: The reservoir has been permanently isolated. The wellbore below the barrier is no longer accessible.

Abandoned Phase 2: All intermediate zones with flow potential have been permanently isolated. The wellbore below the barrier is no longer accessible.

Abandoned Phase 3: A fully abandoned well meaning the well origin at the surface has been removed and the well origin will never be used again.

Completed (Operating): A completed wellbore that is wellbore that is currently active.

[6] Chrysaor Resources (Irish Sea) Limited, is within the group companies of Harbour Energy.

ID[4]	Operator/owner	Well status[5]	Distance from windfarm site (km)
110/08a-C2	Spirit Energy Production UK Limited	Abandoned Phase 2	Within windfarm site
110/08a-C6	Spirit Energy Production UK Limited	Abandoned Phase 2	Within windfarm site
110/07a- 8	Chrysaor Resources (Irish Sea) Limited	Abandoned Phase 3	Within windfarm site
110/08a-C1	Spirit Energy Production UK Limited	Abandoned Phase 2	Within windfarm site
110/08a-C5	Spirit Energy Production UK Limited	Abandoned Phase 2	Within windfarm site
110/07a- 4	Chrysaor Resources (Irish Sea) Limited	Abandoned Phase 3	0.06
110/07a- 7	Chrysaor Resources (Irish Sea) Limited	Abandoned Phase 3	0.09
110/03- 3	Spirit Energy Production UK Limited	Abandoned Phase 3	0.64
110/07a-T3	Chrysaor Resources (Irish Sea) Limited	Completed (Operating)	0.92
110/07- 3	Chrysaor Resources (Irish Sea) Limited	Abandoned Phase 3	0.93
110/07a-T1	Chrysaor Resources (Irish Sea) Limited	Abandoned Phase 1	0.95
110/07a-T1Z	Chrysaor Resources (Irish Sea) Limited	Completed (Operating)	0.95
110/07a-T2	Chrysaor Resources (Irish Sea) Limited	Completed (Operating)	0.95

17.52 Oil and gas surface infrastructure within the study area are shown in **Figure 17.3** and Table 17.13~~Table 17.13~~. There is a 500m safety zone around oil and gas platforms. In addition, a 1.5nm radius buffer zone has been established around oil and gas platforms with a helideck, within which no WTGs or OSP(s) would be located. Areas of the windfarm site beyond this 1.5nm buffer zone are referred to as Unconstrained Areas where WTGs and OSP(s) can be located. The Unconstrained Areas are being considered throughout the Project design process and when developing layout scenarios with buffer zones secured in the draft DCO.

17.53 The nearest active platforms to the Project are the Calder CA1 (1.5nm from the Unconstrained Areas) and the South Morecambe gas field Central Processing Complex (CPC) (1.5nm from the Unconstrained Areas).

17.54 CPC is comprised of three bridge linked platforms including an accommodation platform (AP1), central production platform (CPP1) and drilling platform (DP-1). AP1 and CPP1 together are referred to as CPC-1. There is also a flare platform (FL1). The CPC hub complex are platforms on jacket substructures which are owned and operated by Spirit Energy. Calder CA1 is owned by Harbour Energy and operated by Spirit Energy. Calder CA1 is a small production platform with a single topside located to the mid-west of the windfarm site boundary. Calder operates using a normally unmanned platform which can be accessed by maintenance crews via helicopter.

Table 17.13 Oil and gas surface infrastructure within the study area (NSTA, 2024). Those platforms within 9nm of the Project (blue shading) are within the 9nm helicopter consultation zone.

ID	Owner	Infrastructure	Distance from the Project windfarm site	Status
South Morecambe DP3	Spirit Energy	Remote drilling platform - abandoned	Within windfarm site	Decommissioned and removed
Calder CA1	Harbour Energy PLC	Remote drilling and production platform with helideck	0.9km (1.5nm from Unconstrained Area)	Active
South Morecambe AP1 (CPC-1)	Spirit Energy	Accommodation platform with helideck (CPC-1)	1.5km (1.5nm from Unconstrained Area)	Active
South Morecambe CPP1 (CPC-1)	Spirit Energy	Central processing platform	1.6km (1.5nm from Unconstrained Area)	Active
South Morecambe DP1	Spirit Energy	Platform with helideck	1.7km (1.5nm from Unconstrained Area)	Active
South Morecambe FL1	Spirit Energy	Flare platform	1.7km (1.5nm from Unconstrained Area)	Active
South Morecambe DP6	Spirit Energy	Remote drilling platform with helideck	3.2km (2.2nm from Unconstrained Area)	Active
South Morecambe DP4	Spirit Energy	Platform	5.1km (2.8nm from Unconstrained Area)	Decommissioned and removed
South Morecambe DP8	Spirit Energy	Platform with helideck	6.2km (3.8nm from Unconstrained Area)	Active
OSI (Offshore Storage Installation)	ENI UK Limited	Offshore storage with helideck	7.7km (4.3nm from Unconstrained Area)	Active
Hamilton North	ENI UK Limited	Platform with helideck	12.1km (6.7nm from Unconstrained Area)	Active

ID	Owner	Infrastructure	Distance from the Project windfarm site	Status
DPPA North Morecambe	Spirit Energy	Remote drilling platform with helideck	14.3km (8.2nm from Unconstrained Area)	Active
Conwy Platform	ENI UK Limited	Conwy NPAI platform with helideck	14.6km (8.1nm from Unconstrained Area)	Active
Hamilton	ENI UK Limited	Wellhead steel	21.2km	Active
Douglas DA	ENI UK Limited	Accommodation jack-up with helideck	23.7km	Active
Douglas DP	ENI UK Limited	Production steel	23.8km	Active
Douglas DW	ENI UK Limited	Wellhead steel	23.8km	Active
Lennox	ENI UK Limited	Wellhead steel with helideck	25.1km	Active
Millom West Platform	Harbour Energy PLC	Remote drilling and production platform with helideck	26.9km	Active
Barrow Gas Terminal	Spirit Energy	Gas terminal	35.8km	Active
Point of Ayr	ENI UK Limited	Gas terminal	45.9km	Active

17.5.2.2 Oil and gas licence areas

17.55 For the purpose of oil and gas licensing, the UK continental shelf is divided into quadrants, and within each quadrant, licence blocks. Different types of licence[7] for particular blocks, or part blocks, are issued by the NSTA through competitive annual Seaward Licensing Rounds under the Petroleum Act 1998 (as amended). Licence block 112/25 is within Isle of Man territorial waters and is licenced under a separate authority. Within this block, Manx company Crogga has permission for gas exploration, including seismic surveys.

17.56 Table 17.14~~Table 17.14~~ and **Figure 17.3** shows current licenced blocks that overlap with the windfarm site and licence blocks within 50km of the windfarm site.

Table 17.14 Current licence blocks in the study area, NSTA, 2024

Quadrant block	Licence organisation group	Licence type	Licence status	Distance from Project windfarm site (km)
110/7a	ENI UK Limited, Harbour Energy PLC	Production	Extant	Overlapping windfarm site
110/2a	Spirit Energy	Production	Extant	Overlapping windfarm site
110/3a	Spirit Energy	Production	Extant	Overlapping windfarm site
110/8a	Spirit Energy	Production	Extant	Overlapping windfarm site
110/2b	Harbour Energy PLC	Production	Extant	1.1
110/9c	Burgate Exploration & Production LTD, Energypathways Irish Sea Limited	Production	Extant	6.2
110/4a	Burgate Exploration & Production LTD, Energypathways Irish Sea Limited	Production	Extant	6.3
110/13a	ENI UK Limited	Production	Extant	9.8
110/12a	ENI UK Limited	Production	Extant	11.8

[7] Such as production licences, exploration licences and innovation licences. More information on the types of licences is available from the NSTA: https://www.nstauthority.co.uk/Regulatory-Information/licensing-and-consents/types-of-licence/

Quadrant block	Licence organisation group	Licence type	Licence status	Distance from Project windfarm site (km)
110/14a	ENI UK Limited, Harbour Energy PLC	Production	Extant	16.9
110/13b	ENI UK Limited,	Production	Extant	20.5
113/27b	Spirit Energy	Production	Extant	22.2
110/15a	ENI UK Limited,	Production	Extant	21.8
110/14c	ENI UK Limited, Harbour Energy PLC	Production	Extant	22.7
112/25	Crogga Limited	Production	Isle of Man licence granted	44.8

17.57 The 33rd oil and gas licensing round was launched on the 7th October 2022 with licencing blocks available surrounding and overlapping with the Project site (NSTA, 2023), shown in **Figure 17.3**. A total of 27 licences were awarded in 2023 relating to the priority areas in the central and northern North Sea, and West of Shetland. On 3 May 2024 the NSTA announced the Tranche 3 awards for the 33rd Round, comprising of 31 new licences made up of 88 blocks/part blocks in the Central North Sea, East Irish Sea and the Southern North Sea, with two located within the Irish Sea to the North and West of the windfarm site.

17.5.2.3 CCS

17.58 CCS refers to a variety of processes which capture and store carbon dioxide emissions and aims to aid the UK in achieving net zero. Working with CCS, CCUS focusses on reusing the carbon dioxide (CO_2) from industrial processes by converting it into goods. The UK government ambition is to capture and store 20-30 million tonnes of CO_2 per year by 2030 and over 50 million tonnes per year by 2035. CCS involves the capture and subsequent storage of carbon dioxide emissions generated from industrial processes within rock formations in the UKCS, including depleted oil and gas reservoirs.

17.59 An Agreement for Lease (AfL) with The Crown Estate was awarded for the Gateway Gas Storage Facility in 2018, which covers offshore rights in the east of the Irish Sea for a 1.5 billion cubic metres (bcm) salt cavern gas storage facility. It is proposed that natural gas is stored in artificially created salt caverns, connected to the shore at Barrow-in-Furness via a pipeline. No development activities have taken place to date and the storage facility is located 4km to the northeast of the windfarm site, with no direct overlap.

17.60 In 2020 ENI UK Limited (Eni) were awarded a CO_2 appraisal and storage licence (carbon storage licence). The licence covers an area located within the Liverpool Bay area of the Eastern Irish Sea (EIS). Under the licence, Eni plans to reuse and repurpose depleted hydrocarbon reservoirs (the Hamilton, Hamilton North and Lennox fields) and associated infrastructure (known as the HyNet North West Project) to permanently store CO_2 captured in northwest England and north Wales. These fields are located 10km to the south of the windfarm site and there is no direct overlap.

17.61 The NSTA launched the UK's first carbon storage licensing round in 2022, from which 21 carbon storage licences were awarded across the UKCS. The NSTA invited applications for Carbon Dioxide Appraisal and Storage Licences, granting rights for the exploration and appraisal of potential storage sites, and storage (if a storage permit is granted in respect of a storage site) of carbon dioxide. Associated with the EIS Area 1 an appraisal licence (CS010) was awarded to Spirit Energy in 2023 as part of the licensing round. This appraisal licence is connected to a Spirit Energy proposed scheme, known as the Morecambe Net Zero Cluster project which aims to provide a carbon storage and hydrogen production cluster within the depleted North and South Morecambe gas fields. The southern extent of the EIS Area 1 (an area of 29.06km² of a total 211.39 km²) overlaps with the windfarm site (**Figure 17.3**).

17.5.3 Sub-sea cables and pipelines

17.5.3.1 Oil and gas

17.62 The presence of the oil and gas industry within the Irish Sea requires infrastructure to connect offshore installations to each other and to onshore facilities. Details in this section are provided for active sub-sea pipelines, umbilicals and cables within 10km of the windfarm site, details of which are provided in **Table 17.15**~~**Table 17.15**~~.

Table 17.15 Existing oil and gas pipelines, umbilicals within 10km of the windfarm site

Description	Owner	Fluid	Distance from the Project windfarm site (km)
Rivers Onshore Terminal to Calder 3" line	Harbour Energy PLC	Chemical	Within the Project windfarm site
Calder to Rivers Onshore Terminal 24" gas line	Harbour Energy PLC	Gas	
Morecambe DP3 to CPC 24" gas line (not in use)	Spirit Energy	Gas	
Morecambe CPC to DP3 2" line (not in use)	Spirit Energy	Other Fluid	

Description	Owner	Fluid	Distance from the Project windfarm site (km)
Morecambe DP6 to CPC 24" gas line	Spirit Energy	Gas	1.6
Morecambe CPC to DP6 2" line	Spirit Energy	Other Fluid	1.6
Morecambe CPC to DP8 2" line	Spirit Energy	Other Fluid	1.6
Morecambe DP8 to CPC 24" gas line	Spirit Energy	Gas	1.6
South Morecambe 36" gas trunkline	Spirit Energy	Gas	1.6
Douglas to CACM 14" oil line	Eni UK Limited	Oil	7.8

17.63 As shown in **Figure 17.4**, the only power cables within the windfarm site relate to the South Morecambe and Calder gas fields. A power cable runs between the Calder CA1 platform and the South Morecambe CPC, crossing the northwest corner of the site and extending beyond the western and northern boundaries of the site. Cables between CPC and the decommissioned DP3 platform are also present in the windfarm site. As the DP3 platform topside and jacket are now decommissioned and removed, the cables are no longer in use and are likely to have been cut at a point where they were sufficiently buried or would have been recovered to shore.

17.5.3.2 Windfarm cables

17.64 A number of existing offshore windfarm export cables make landfall in the study area (**Figure 17.4**). The closest is 11km to the north of the windfarm site, which connects Walney Extension to the landfall at Heysham. Further information on windfarm cables in the study area is provided in **Table 17.16~~Table 17.16~~**.

Table 17.16 Summary of existing windfarm cables in the study area

Description	Orientation	Distance from the Project windfarm site (km)
Walney Extension offshore transmission owner (OFTO) Wind Export	North of Project windfarm site, landfall at Heysham	11.0
West of Duddon Sands OFTO Wind Export	North of Project windfarm site, landfall at Heysham	19.4
Walney 2 OFTO Wind Export	North of Project windfarm site, landfall at Heysham	19.7

Description	Orientation	Distance from the Project windfarm site (km)
Walney 1 OFTO Wind Export	North of Project windfarm site, landfall at Heysham	22.6
Barrow OFTO	North of Project windfarm site, landfall at Heysham	23.0
Ormonde OFTO Wind Export	North of Project windfarm site, landfall at Heysham	23.8
Burbo Bank Extension Wind Export and powerline	South of Project windfarm site, connecting infrastructure at Liverpool Bay	34.0
Burbo Bank Extension OFTO Wind Export	South of Project windfarm site, landfall at Prestatyn	34.0
North Hoyle Wind Export	South of Project windfarm site, landfall at Kinmel Bay	38.8
Gwynt y Môr OFTO Wind Export and associated powerline	South of Project windfarm site, landfall at Abergele	35.0
Rhyl Flats	South of Project windfarm site, landfall at Abergele	42.0

17.5.3.3 Telecommunication and power cables

17.65 Active telecommunications and power cables are located within and surrounding the windfarm site (**Figure 17.4**). Details are provided in **Table 17.17~~Table 17.17~~**.

Table 17.17 Existing telecommunications and power cables within and around the windfarm site

Description	Distance from the Project windfarm site (km)
Vodafone Lanis 1 telecom cable	Adjacent to the southern and south western boundary of the windfarm site
Hibernia 'A' telecom cable/ EXA Atlantic telecom cable	Within (transects through the windfarm site)
Havhingsten telecom cable	0.7
Sirius South telecom cable	2.1
Rockabill telecom cable	2.3
Hibernia 'C'	2.5
Hibernia ‘C’ Atlantic	2.5
Isle of Man/UK Interconnector	4.6
ESAT 2	5.4

17.66 The EXA Atlantic (formerly GTT Hibernia Atlantic) telecom cable transects the windfarm site through the centre from east to west (see **Figure 17.4**). This cable connects Southport on the mainland UK with Coleraine in Northern Ireland and then crosses the Atlantic to Nova Scotia in Canada. The Vodafone Lanis 1 telecom cable runs along the southern border of the site, connecting the Isle of Man with the UK, coming ashore to the south of Blackpool (see **Figure 17.4**).

17.67 The Irish Sea is crossed by a large number of cables which provide electrical supply between the UK and offshore oil and gas facilities and offshore wind projects. Additionally, interconnector cables provide electrical supply between mainland Britain with the Isle of Man and Ireland.

17.68 As shown in **Figure 17.4** and noted in **Section 17.5**, power cables within the windfarm site relate to the South Morecambe and Calder gas fields.

17.69 The nearest powerline to the windfarm site is the Isle of Man/UK Interconnector operated by Manx Electricity Authority which is 4.6km to the northeast of the windfarm site (at its closest point).

17.70 An increasing amount of interconnector projects could be developed in the coming years. Within the study area this includes a second interconnector between the Isle of Man and the UK (a potential cable in the vicinity of the Project) and the MaresConnect 750MW subsea and underground electricity interconnector system which would pass south of the Project connecting Ireland and Great Britain with connection into north Wales. Potential effects with proposed projects are considered in **Section 17.7**.

17.5.4 Disposal and aggregate sites

17.71 There are 10 open disposal sites in the study area, but none within the windfarm site (**Table 17.18~~Table 17.18~~**). The nearest closed site is IS195, associated with the Gateway Gas Storage Project, which is 4.1km to the north-east of the windfarm site. The nearest active disposal site is IS150 which lies 16.8km to the south of the windfarm site. Dredged material was disposed in this site in 2013 during the construction of the new deep water container terminal, Liverpool II, at the old Seaforth docks.

17.72 There are three aggregate licence blocks in the study area, none of which are within the windfarm site. The nearest is Area 457 Liverpool Bay Aggregate Production Area, which lies 9.5km south of the windfarm site and is operated by Westminster Gravels for extraction of sand and gravel. The current licence extended to 2023 and a scoping report has been submitted to the MMO in support of an application to extend the licence for a further 15 years with a maximum total extraction of 18 million tonnes.

17.73 Disposal and aggregate sites within 50km of the windfarm site are shown in **Figure 17.5** and listed in **Table 17.18~~Table 17.18~~.** Further information is provided in **Chapter 14 Shipping and Navigation** which outlines the potential effect of the Project's contracted vessels on the vessel operations associated with these existing marine disposal sites.

Table 17.18 Disposal and aggregate area sites within the study area

Description	Site type	Distance from the Project windfarm site (km)	Status
IS195 Gateway Gas Storage Project	Disposal site	4.1	Closed
IS150 Liverpool outer Disposal Site Y	Disposal site	16.8	Open
IS149	Disposal site	17	Closed
Walney OWF	Disposal site	18.5	Closed
IS070 Morecambe Bay Lune Deep Disposal Site	Disposal site	18.5	Closed
IS215 Walney OWF	Disposal site	18.6	Closed
BHP Pipeline Route	Disposal site	18.6	Closed
Liverpool Bay (Sludge) B	Disposal site	18.9	Closed
IS071 Liverpool Bay	Disposal site	20.2	Closed
IS148 BHP Pipeline Route	Disposal site	21.7	Closed
Preston	Disposal site	22.2	Closed
IS147	Disposal stie	24.5	Closed
IS145	Disposal stie	24.6	Closed
IS210 Barrow D	Disposal site	22.7	Closed
IS205 Barrow D	Disposal site	22.7	Open
IS140 Site Z	Disposal site	23.9	Open
BHP Pipeline Route	Disposal site	24.2	Closed
Barrow A	Disposal site	26.8	Closed
IS135 Burbo Bank Extension OWF	Disposal site	29.1	Open
IS132	Disposal site	32.0	Closed
Morecambe Bay: Lune Deep	Disposal site	30.1	Open
Formby & Taylors Point	Disposal site	32.0	Closed
Fleetwood Channel	Disposal site	34.4	Closed
River Wyre Estuary	Disposal site	34.5	Closed
IS200 Morecambe Bay B	Disposal site	34.6	Open

Description	Site type	Distance from the Project windfarm site (km)	Status
East Lytham	Disposal site	36.2	Open
Dee Estuary	Disposal site	44.7	Closed
Lune River	Disposal site	45.0	Closed
Lune River B	Disposal site	45.2	Open
Mostyn Deep	Disposal site	45.2	Closed
Mostyn Deep (Maintenance)	Disposal site	45.4	Open
Wallasey	Disposal site	46.3	Closed
Ribble Link	Disposal site	46.3	Closed
Savick Brook	Disposal site	46.4	Closed
Glasson Dock	Disposal site	46.6	Closed
Point Of Ayr Foreshore	Disposal site	46.7	Closed
Mersey (Mid-River Site)	Disposal site	47.0	Open
Bramley Moore Dock	Disposal site	48.9	Closed
Mersey (Mid-River 2)	Disposal site	49.0	Closed
Nelson Dock	Disposal site	49.0	Closed
Conwy Bay	Disposal site	49.9	Closed
Area 457 Liverpool Bay Aggregate Production Area	Aggregate site	9.5	Open
Area 1808 Liverpool Bay Aggregate Exploration and Option Area	Aggregate site	25.7	Open
Area 392 Hibre Swash Production Area	Aggregate site	29	Open

17.5.5 MOD activities

17.74 Information on the existing military bases with the potential to experience aviation and radar effects is available in **Chapter 16 Civil and Military Aviation and Radar**. This chapter considers maritime (seabed) effects to defence activities.

17.75 PEXAs are designated areas which are used for training and defence purposes by the Royal Navy, the Army, the Royal Air Force (RAF) and the MOD. No PEXAs overlap with the windfarm site. The nearest site is D406 MOD Eskmeals - a live weapons test and evaluation range which is 28km to the north of the windfarm site (**Figure 17.5**). These are scoped out of the assessment in line with comments from the MOD on the Scoping Report and PEIR.

17.76 Consultation with the MOD has also highlighted no overlap of the windfarm site with areas of the seabed that have been subject to highly detailed surveying for defence and national security purposes.

17.5.6 Nuclear power stations

17.77 Three nuclear power stations are found along the English coastline of the Irish Sea; Heysham in Morecambe, Sellafield and Calder Hall on the Cumbrian coast. There is no overlap with any infrastructure that could result in effects on or from these facilities and these are scoped out of further assessment.

17.5.7 Tourism and recreation

17.78 This section provides an overview of marine recreational activity and tourism which has the potential to interact with the Project, namely recreational boating, angling and other activities such as diving.

17.79 The Irish Sea is a popular recreational boating area with cruising and racing routes from between points on the English, Welsh, Scottish and Irish coasts as well as to and from the Isle of Man. Data collected by the RYA identifies low intensity routes across the Irish Sea and boating areas along the coastline, and two general boating areas within 50km of the windfarm site (RYA, 2019). The closest general boating area is 7.5km to the east of the windfarm site and covers the coast from Blackpool to Broughton in Furness. There are several marinas and harbours used by recreational craft in this area, and there are three recorded routes for recreational craft linking England with the Isle of Man and two routes linking with Ireland from the north coast of Wales and Anglesey. High intensity recreational boating routes are not recorded within the windfarm site, but routes linking the Isle of Man, Northern Ireland and the Republic of Ireland are within the study area, with the closest high intensity boating route approximately 26.5km to the south of the windfarm site, approaching Liverpool. Further information on the existing environment relating to recreational craft is presented within **Chapter 14 Shipping and Navigation** which highlights there is little recreational activity in the windfarm site, with recreational vessels remaining predominantly along the coast, particularly along the entrance to Liverpool, and around Holyhead, Douglas and Rhyl.

17.80 Marine recreational angling (any fishing for marine species primarily using rod and line where the purpose is recreation and not for the sale or trade of the catch) is a high participation activity (around 1 million people each year in Britain), with significant economic and social benefits, and potential impacts on fishing stocks (Hyder *et al*., 2021). In England, angling is done using three platforms: shore, private boats, and charter boats. The majority of recreational

angling occurs within inshore waters, with shore fishing accounting for up to 75% of the total (Armstrong *et al*., 2013).

17.81 The windfarm site lies approximately 30km from the nearest coastline and is within the North West Offshore Marine Plan Area (Defra, 2021) and is not known to be subject to high numbers of anglers. In 2013 the MMO modelled potential angling activity in England and the windfarm site was classed as a 'low' potential region (MMO 2014). In a 2020 report to map sea angling in England, it was noted that available information for the northwest offshore region was particularly poor from a range of data sources that included literature reviews, surveys, and local knowledge, highlighting the low levels of recreational angling that occurs in this area (MMO 2020). In addition, out of 399 identified charter boats in England operating between 2012-13, just 9 boats were registered in the northwest region (Armstrong *et al*., 2013). Charter boats UK list three vessels on the North West Coast in Fleetwood and Liverpool and 11 on the coast of North Wales. Face to face consultation were advertised to understand fishing activity within the windfarm site, with meetings advertised in November 2022 and further fisheries meetings held in September 2023.

17.82 Recreational diving companies are based in Blackpool and Morecambe however, MMO modelling of recreational diving shows this to be low across the windfarm site (MMO, 2014).

17.83 Information on the existing environment relating to the tourism economy is provided in **Chapter 20 Socio-economics, Tourism and Recreation** (Document Reference 5.1.20).

17.5.8 UXO

17.84 A historic British military training area overlaps with the windfarm site and the Applicant has undertaken a desk-top study to identify the potential for UXO. An initial geophysical survey has been undertaken and further survey work would be undertaken pre-construction to identify UXO. Priority would be given to avoidance and removal of UXO, followed by detonation (low order and then high order). There poses a risk to surrounding infrastructure and other marine users, however processes for managing UXO risk, and communication with surrounding users would be followed as appropriate, noting guidance such as:

- Construction Industry Research and Information Association (CIRIA) C754, Assessment and management of UXO risk in the marine environment, 2015
- Carbon trust, Guidance for geophysical surveying for UXO and boulders supporting cable installation, Offshore Wind Accelelerator, 2020

17.85 A separate marine licence would be sought for any required UXO clearance campaigns and as such would be assessed in further detail as part of this process when details of activities are better defined.

17.5.9 Future trends

17.86 The North West Offshore Marine Plan (Defra, 2021) identified the Irish Sea area for the growth and variety of industries, including energy generation, ports, aggregate extraction, tourism and fisheries.

17.87 The deployment of offshore wind in the UK is set to continue with a growing pipeline of projects in planning and further expansion aiming to achieve a targeted 50GW offshore wind capacity by 2030. Therefore, offshore wind deployment in the Celtic and Irish Seas is likely to increase over the next 10 to 20 years.

17.88 The oil and gas industry is in a period of slow decline with existing gas fields reaching the end of their economic lives and the rate of new field development declining. It is likely that the baseline of steady decline in the oil and gas industry will continue. In proximity to the Project, the South Morecambe and Calder gas fields have been producing since the mid-1980's whilst the North Morecambe field commenced production in the late 1990's. It is understood that these mature gas fields are reaching end of economic life. The South Morecambe DP3 platform (charted within the windfarm site) and DP4 platform have been decommissioned and recently removed.

17.89 In the British Energy Security Strategy Policy Paper (Department for Business, Energy and Industrial Strategy (BEIS)[8] and Prime Minister's Office, 2022) the need to address our underlying vulnerability to international oil and gas prices by reducing our dependence on imported oil and gas, and the efficiency of this transition is based on the delivery of renewable projects and reduces our exposure to volatile fossil fuel markets. The paper details the government's 'Ten-point plan for a green industrial revolution', together with the 'Net Zero strategy' (DESNZ, 2021) the intention is that Energy Strategy should drive initiatives to ensure the UK is far more self-sufficient in generating its own energy from UK renewable energy sources into the future, leading to a shift in energy generation from fossil fuels to renewable energy.

17.90 However, it is acknowledged that the NSTA continues to award new licences for oil and gas exploration, appraisal and storage, and that new projects would be developed. Several developers for oil and gas may have a requirement to

[8] As of February 2023, the Department of Business, Energy and Industrial Strategy (BEIS) is known as the Department for Energy Security and Net Zero (DESNZ).

undertake seismic surveys, to identify sub surface geological structures that may hold reserves of oil and gas or enable gas or carbon storage.

17.91 To facilitate collaboration between industries the Offshore Wind and CCUS Co-location Forum (the Forum) has been established. Led by The Crown Estate, the Forum brings together the NSTA, the Carbon Capture and Storage Association (CCSA), RenewableUK, Government and Crown Estate Scotland to provide strategic coordination of co-location research and activity to help maximise the potential of the seabed. The Project's design is being progressed to co-exist with existing oil and gas infrastructure, whilst also being cognisant to co-exist with any future CCS projects.

17.92 Several options for future power connection, via a second sub-sea interconnector cable, between the Isle of Man and the UK are currently being considered, with one potential offshore cable route/corridor in the vicinity of the Project. At present options are still in the high-level feasibility stage.

17.6 Assessment of effects

17.93 An assessment of the potential effects associated with the Project on infrastructure and other users is outlined in this section. The assessment considers the potential magnitude and significance (and value) of impacts arising from the construction, operation and maintenance, and decommissioning phases of the Project.

17.94 Receptors potentially present in the study area are:

- Other windfarms or renewable energy developments
- Oil and gas infrastructure and future exploration, including CCS
- Subsea cables and pipelines
- Disposal and aggregates sites
- Tourism and recreation
- MOD activities

17.6.1 Potential effects during construction

17.6.1.1 Impact 1: Potential effects on other windfarms or renewable developments

17.95 The construction of the Project has the potential to interfere with activities at other offshore windfarm projects within the study area (no interaction with other renewable developments have been identified). For example, vessel movements undertaking construction activities associated with the Project have the potential to interfere with operation and maintenance activities of operational windfarms through increased traffic. Vessel and/or aviation

activities, including increased vessel activity and helicopter operations associated with the Project are addressed in **Chapter 14 Shipping and Navigation** and **Chapter 16 Civil and Military Aviation and Radar** respectively. This chapter considers the overall impacts to these assets and activities.

17.96 The nearest operational offshore windfarm to the Project is the West of Duddon Sands Wind Farm which is 12.9km away. Further operational windfarms within the study area include the Walney One and Walney Two Wind Farms, the Walney extension projects, Burbo Bank and Burbo Bank Extension, Barrow, West of Duddon Sands and Ormonde. Given the distances of these windfarms to the Project, no direct impacts are expected from the Project construction works. Interactions with the operational and maintenance activities of these windfarms may occur with construction activities associated with the Project (such as increased vessel and helicopter routing).

17.97 While there is separation between the Project and the existing offshore windfarm projects and construction safety zones would be in place during construction activities, there would be an increase of vessels in the area due to construction vessels transiting to and from the construction port(s). While the construction port(s) has not yet been selected by the Applicant, consideration of existing windfarm operations would be part of the decision-making process. Impacts to shipping and navigation as a result of the Project are considered in **Chapter 14 Shipping and Navigation**.

17.98 Embedded mitigation measures as detailed in **Section 17.3.3** would act to reduce or avoid potential risk of adverse effects to the operations of other windfarms resulting from the Project construction phase. This would include the use of NtM and other notifications of planned construction activity, the use of appropriate lighting, marking and charting of each infrastructure/activity, co-ordination of activities, in addition to ongoing engagement between the other windfarm developers and any nominated contractors.

17.99 It is noted (**Appendix 17.1** and **Section 17.3.3**) that the Project is required to be compliant with MGN 654 to provide obstruction free SAR access to ensure SAR helicopters which are tasked for major incidents, accidents and urgent medivacs would not be constrained.

17.100 Engagement has been initiated with windfarm developers across the study area (**Table 17.1**~~**Table 17.1**~~) and would continue throughout all phases of the Project in relation to planned activities. Navigational control measures (as outlined in **Chapter 14 Shipping and Navigation** and the NRA, **Appendix 14.1**) would also be implemented through the Project phases. Embedded mitigation related to aviation are outlined in **Chapter 16 Civil and Military Aviation and Radar**. Considering these measures, the relatively short-term construction period (2.5 years), and the engagement that would be undertaken

with surrounding projects as required, the magnitude of effect to other offshore windfarm developers has been assessed as **low**.

17.101 The sensitivity/value of existing offshore windfarms to disturbance from construction of the Project has been assessed as **medium**.

17.102 The effect has been assessed as **minor adverse** which is **not significant** in EIA terms. The assessment reflects the national importance of existing windfarm developments, the distance between the projects, the duration of the construction phase and the application of embedded mitigation measures (**Table 17.3**~~**Table 17.3**~~), whilst also considering the capacity for other operators to accommodate the anticipated interaction with construction activities.

17.6.1.2 Impact 2: Potential effects on oil and gas infrastructure and future exploration, including CCS

Existing scenario

17.103 The windfarm site overlaps with the Morecambe South and Calder gas fields. Operations may be affected by access restrictions and by the increased vessel and helicopter activity associated with construction and installation of Project infrastructure. Any conflicts with existing shipping activities, including those associated with the oil and gas industry, are addressed in **Chapter 14 Shipping and Navigation**.

17.104 On a precautionary basis the assessment on oil and gas infrastructure for the construction phase considered the full build out of Project infrastructure and as such is assessed as per during the operation and maintenance phase. Impacts are as detailed in **Section 17.6.2.2**. With the implementation of embedded and additional mitigation, as secured in the draft DCO, the magnitude of impacts to oil and gas infrastructure and activities has been assessed to be **low**. The resulting effect on existing oil and gas operations has been assessed to be **minor adverse** and not significant in EIA terms.

Future scenario

17.105 It is possible that any potential future exploration, drilling or installation of new oil and gas or CCS projects within licence blocks overlapping or surrounding the windfarm site could be limited by Project construction activities. Details of the production licences may include commitments to further development or exploration. Should any seismic surveys be required within these licenced blocks during the construction phase there is the potential that these would be restricted (due to the size of the seismic equipment). The Applicant is working collaboratively with oil and gas operators in the area to coordinate development activities, noting that in 2024 the Applicant is coordinating geotechnical surveys for the Project with seismic surveys being conducted for CCS exploration. In line with the embedded mitigation set out in **Section**

17.3.3 the Applicant would continue to communicate and coordinate Project development activities with relevant operators prior to and during construction.

17.106 There is no overlap of the windfarm site with the licences associated with the 33rd offshore licensing round, Gateway Gas Storage Facility or the ENI UK Limited HyNet project in Liverpool Bay. The CCS EIS Area 1 overlaps with the windfarm site. Details on any project schedules associated with this area following appraisal licensing (EIS Area 1 Morecambe Area - Licensee Spirit Energy Production UK Ltd, Licence number CS010) are limited (noting the Spirit Energy Morecambe Net Zero Cluster Project for which exploration surveys are being initially undertaken). However, if construction phases overlap, coordination with the operators would be necessary to minimise potential effects (including vessel interactions), and it is expected that the Applicant and any such operator would enter discussions and be steered by advice from relevant authorities. The Crown Estate believes the benefits that co-location of both offshore wind and CCUS will help maximise the clean energy return from the UK's natural heritage.

17.107 To identify solutions to the challenges presented by co-locating these two technologies and help make co-location a reality, The Crown Estate established the Offshore Wind and CCUS Co-location Forum in July 2021 which followed a recommendation from the CCUS & Offshore Wind Overlap Study (The Crown Estate, 2021). Common elements of the potential risks included:

- A lack of clarity over how issues associated with overlapping Offshore Wind and CCS projects such as development planning/precedence, promotion of collaboration, alignment of standards, cross-industry liabilities and dispute mediation would be handled
- The requirement to perform monitoring, measurement and verification (MMV) surveys (particularly seismic surveys) for CCS projects across their lifecycle and the interaction with Offshore Wind infrastructure
- A higher level of offshore operations that result from locating two projects in the same area
- Direct physical effects on infrastructure or personnel due to incidents occurring as a result of overlapping projects
- The physical infrastructure of a pre-existing project blocking access to the seabed or modifying the requirements for new projects

17.108 Embedded mitigation measures as detailed in **Section 17.3.3** would act to reduce or avoid potential risk of adverse effects that may arise, such as the potential for vessel interactions. Engagement will be maintained with oil and gas operators to ensure co-ordination as projects arise.

17.109 A **low** magnitude has been assigned given the availability of wider areas, the ability to undertake co-existence planning, the likelihood of interactions with future exploration or development activity in the windfarm site during the construction phase and the commitment to continued consultation as part of embedded mitigation. The sensitivity/value of the licence operators has been assessed as **medium**, given the capacity to accommodate interactions.

17.110 The effect has been assessed as **minor adverse** on potential oil and gas exploration and development (including CCS), which is **not significant** in EIA terms.

17.6.1.3 Impact 3: Physical effects on subsea cables and pipelines

17.111 Construction activities for the Project (such as cable and foundation installation, jack-up vessels and debris clearing operations) in proximity to existing cables and pipelines and at cables/pipeline crossings has the potential to damage existing assets. There is also the potential for effects from incidents such as dropped objects which may cause damage to subsea cables and pipelines. The EXA Atlantic (formerly GTT Hibernia Atlantic) telecommunication cable transects east to west through the centre of the windfarm site and the Vodafone Lanis 1 telecom cable runs along the southern border of the site. Additionally, power cables and pipelines connecting oil and gas infrastructure are also present in the windfarm site (including the DP3 to CPC-1 gas line (not in use), the Calder to Rivers Onshore Terminal gas line and the Calder CA1 to CPC-1 power cables).

17.112 As embedded mitigation, the Project layout design would include separation distances between the WTGs/OSP(s) and existing cables/pipelines (as set out in **Table 17.3~~Table 17.3~~**) and would look to minimise cable crossings where practical. Furthermore, where the Project's inter-array or platform link cables cross an existing cable or pipeline, a crossing and proximity agreements would be established with the asset owner. This secured by protective provisions in favour of the relevant parties in the draft DCO.

17.113 The sensitivity/value of existing subsea cables and pipelines to disturbance from construction related hazards such as damage from dropped objects and anchors associated with installation activities or from seabed activities such as ploughing has been judged to be **high** given the potential for direct impacts and the difficulty and costs associated with cable repair. With embedded mitigation (**Table 17.3~~Table 17.3~~**) and low likelihood of damage, the magnitude has been assessed as **negligible**. The effect has been assessed as **minor adverse** which is not significant in EIA terms.

17.114 The sensitivity/value of existing subsea cables and pipelines to effects associated with planned cable crossings was assessed to be the same as for general construction activities, with a sensitivity/value of **high**. By avoiding

crossings as far as possible and undertaking crossing agreements where crossings cannot be avoided, the magnitude of the effect would be reduced to **negligible**. The effect has been assessed as **minor adverse** which is not significant in EIA terms.

17.6.1.4 Impact 4: Potential effects on disposal and aggregates sites

17.115 There is no overlap with aggregate or disposal areas and thus no direct effects. Indirect effects from increased suspended sediment and deposition are also not identified given the closest active disposal ground is beyond 15km which is outside the ZoI for sediment and deposition effects detailed in **Chapter 7 Marine Geology, Oceanography and Physical Processes** (Document Reference 5.1.7).

17.116 The construction of the Project has the potential to interfere with the vessel operations of the existing marine disposal sites. Active dredger routes are present in the study area, and a low use dredger route between Heysham and the Off Skerries TSS passes through the windfarm site. Areas of higher activity are 4km to the south of the windfarm site connecting Liverpool harbour, and 7km to the north of the windfarm site approaching Lancaster, with dredger routes from this harbour crossing the windfarm site heading to the south.

17.117 Embedded mitigation measures including charting and marking and lighting would mitigate impacts to dredgers operating between Heysham and the Off Skerries TSS during Project construction. To mitigate the potential interference of Project vessels with the vessel operations of the existing marine disposal sites, the Project would implement embedded mitigation during the construction phase, including distributing NtM to inform other users of the Project's vessel movements. Further details are presented in **Chapter 14 Shipping and Navigation**.

17.118 The sensitivity/value of marine disposal and aggregate site activities to disturbance from construction of the Project has been judged to be **low** with capacity for activities to accommodate the predicted interaction with construction activities. With the application of embedded mitigation measures the magnitude of the effect has been assessed as **negligible**, with construction activities being relatively short-term and temporary. The effect has been assessed as **negligible adverse** which is not significant in EIA terms.

17.6.1.5 Impact 5: Potential effects on tourism and recreation

17.119 Recreational and tourism activities such as sailing, diving and angling in the windfarm site are described in **Section 17.5.7**. During the construction phase there would be temporary 500m safety zones in operation around construction vessels installing infrastructure as well as advisory safety distances. In addition, there would be an incremental increase in the presence of windfarm

infrastructure as construction progresses. This would result in a potential displacement of recreational activities during the construction phase.

17.120 As identified in the Project NRA (**Appendix 14.1)**, the windfarm site is located a considerable distance from the shore and therefore most recreational craft passing through the site would be engaged in offshore cruising. There is limited recreational activity at the windfarm site, however, there is still potential for recreational craft to pass through it. The windfarm site construction area and safety zones would be well marked and there would be sufficient searoom to safely pass around the site, therefore, it is unlikely that a recreational vessel would contact a WTG/OSP. Safety zones around WTGs/OSP(s) as set out in **Table 17.3**~~**Table 17.3**~~ would minimise the risk of contact occurring. Were a recreational vessel to do so, a glancing blow with minor damage is the most credible outcome (**Appendix 14.1**).

17.121 The spatial extent of the construction safety zones for the windfarm site is small in comparison with the wider Irish Sea where recreational activities and angling occur, and the activities associated with the installation of the Project would have a **low** magnitude of displacement. NtM would be provided when necessary throughout construction works. Marine recreational activities are considered to be adaptable and able to tolerate and recover following temporary displacement during the construction phase. The sensitivity/value has therefore been assessed as **low**. The effect has been assessed as **minor adverse** which is not significant in EIA terms.

17.6.1.6 Impact 6: Potential effects on MOD activities

17.122 The sensitivity/value of military activities has been assessed as **high** given national importance. The magnitude of impact during construction has been assessed as **negligible** given there are no PEXA areas or highly surveyed routes that overlap the windfarm site. Additionally, construction activities and changes to the seabed would be communicated to the MOD. As described in **Chapter 16 Civil and Military Aviation and Radar** no significant effects have been identified on radar in relation to MOD assets, with identified mitigations available for effects to flight procedures. The effect has been assessed as **minor adverse** which is not significant in EIA terms.

17.6.2 Potential effects during operation and maintenance

17.6.2.1 Impact 1: Potential effects on other windfarms or renewable developments

17.123 During operation and maintenance, effects on other windfarms (no interaction with other renewable developments have been identified) would relate to Project operation and maintenance vessel movements (transiting crew, monitoring surveys and maintenance vessels), which are expected to be significantly less than for the construction phase. Exceptional maintenance

activities may be necessary and may require the use of large vessels and the imposition of temporary 500m safety zones.

17.124 Helicopters are anticipated to be used only in exceptional circumstances during the operation and maintenance phase.

17.125 Any conflicts with vessel and/or aviation activities, including increased vessel activity and helicopter operations associated with the Project during the operation and maintenance phase are detailed in **Chapter 14 Shipping and Navigation** and **Chapter 16 Civil and Military Aviation and Radar**. This chapter considers overall impacts to other offshore windfarm assets and activities.

17.126 It is noted in **Appendix 17.1** and **Table 17.3~~Table 17.3~~** that the Project is required to be compliant with MGN 654 to provide obstruction free SAR access and therefore SAR helicopters which are tasked for major incidents, accidents and urgent medivacs would not be constrained due to the presence of the operational WTGs.

17.127 Given the separation between the Project and other windfarms and implementation of safety zones as required during maintenance activities within the windfarm site, no direct impacts to other windfarm projects arising from Project maintenance activities are anticipated. There would be an increase of vessels in the area as a result of operation and maintenance vessels associated with the Project transiting to and from the site, however, the NRA (**Appendix 14.1**) assessed that any increase in risk resulting from Project vessels could be mitigated by careful passage planning and communication with other vessels. While the operational port(s) have not yet been selected by the Applicant, consideration of existing windfarm operations would be part of the decision-making process.

17.128 During the operation and maintenance phase the Project would implement embedded mitigation measures through the promulgation of information to operators in the region regarding planned activities (**Table 17.3~~Table 17.3~~**). It is therefore considered the potential for disturbance by the Project's operation and maintenance activities at other offshore windfarm sites would be limited.

17.129 The separation of the Project from other existing windfarms minimises energy yield effects on other windfarms, noting the distance of the closest windfarm (12.9km away) exceeds the 7.5km criteria set by the Crown Estate as part of the Round 4 licencing. A recent study (Frazer-Nash, 2023) identified that at a greater than 10km separation between windfarms there is a levelling off of total interaction loss with buffer distance and by 20km the wake losses become 'vanishingly small'. The Project sits at a greater distance than 10km from other windfarm sites and therefore, the potential for wake effects are not considered further.

17.130 The sensitivity/value of existing offshore windfarms to disturbance from operation and maintenance activities of the Project has been assessed to be **medium**. This reflects the distance between the projects and the capacity for other operators to accommodate the anticipated interaction with operational activities. While the duration of impact in the operation and maintenance phase is longer by comparison to the construction phase, there will be a reduction in vessel traffic/activities associated with construction activities. With the application of embedded mitigation measures (**Table 17.3~~Table 17.3~~**) and navigation control measures (**Appendix 14.1**) the magnitude of the effect has been assessed to be **low**. The effect has been assessed as **minor adverse** which is not significant in EIA terms.

17.6.2.2 Impact 2: Potential effects on oil and gas infrastructure and future exploration, including CCS

Existing scenario

17.131 The windfarm site overlaps with the Morecambe South and Calder gas fields. Operations may be affected by access restrictions due to Project infrastructure. Any conflicts with existing shipping activities, including those associated with the oil and gas industry, are addressed in **Chapter 14 Shipping and Navigation**. This chapter considers the overall access impacts to oil and gas assets and associated activities.

17.132 Given the proximity of oil and gas infrastructure, there is potential for access impacts. The nearest platforms to the windfarm site comprise the normally unmanned CA1 (Calder gas field) located to the west of the windfarm site and the manned South Morecambe Central Processing Complex (containing CPC-1 and DP-1 with helidecks) located north of the windfarm site. These platforms are located 1.5nm from the Unconstrained Areas (where WTGs/OSP(s) will be located) due to the 1.5nm buffer zone included as part of embedded mitigation and secured in the draft DCO.

17.133 Through the combination of the distance of these platforms from the Project and implementation of embedded mitigation measures identified within this chapter and **Chapter 14 Shipping and Navigation**, vessel access could be accommodated with minimal impact. A REWS study (**Appendix 17.2**) has been undertaken to determine whether there is any impact to the system operated by the oil and gas infrastructure. The study concludes the impact of the Project on detection performance of nearby REWS installations is low and manageable without the need for further mitigation measures. The modelling results for the Project also indicate that the assessed REWS platforms would not experience a change in yearly alarm rates as a result of rerouted traffic. The study also concluded there would be no negative impact from the Project on microwave communication links.

17.134 Impacts to helicopter access are considered in detail in **Appendix 17.1**. The study considers access to oil and gas platforms within the 9nm helicopter consultation zone, as recommended by the CAA. Platforms included within this study are detailed in **Table 17.13**~~**Table 17.13**~~. The study considers the embedded mitigation of a 1.5nm buffer zone around platforms with an active helideck where Project WTGs and OSP(s) would not be located. The Unconstrained Areas presented in **Appendix 17.1** describe the area over which WTGs/OSP(s) would be installed (accounting for buffer zones around platforms and cables and pipelines). The study considers both Visual Meteorological Conditions (VMC– flying primarily by sight) and Instrument Meteorological Conditions (IMC – flying primarily by reference to instruments).

17.135 The study has been carried out on a 'worst case' basis. In particular:

- The CAA is currently consulting on a rule change that would limit take-offs and landings of Commercial Air Transport (CAT) helicopters within 3nm of a windfarm to day VMC only. At present, there is no indication if and when these new limitations will be imposed. As a worse case assumption, these increased limits have been applied in the study
- If the rule change does come into effect, applications for IMC access for specific approaches/take-offs may be approved. The study has been carried out on the basis that no such approvals are sought

17.136 The study determined impacts to the normally unmanned CA-1 (Calder field) and the South Morecambe field manned CPC-1. Currently access to both platforms can occur by day and night under both VMC and IMC (although some restrictions, equating to approximately 0.8% of the year exist at CPC-1). For both platforms, the current access is an average of 99% (94.2% VMC and 4.8% usable IMC) of daylight conditions and 98.4% (88.4% VMC and 10.0% usable IMC) of night conditions.

17.137 With the Project in place, CAT access to both platforms would only be permitted under day VMC giving an average day VMC access of 94.2% of daylight conditions (this is unchanged from the current VMC position). Evidence from current operations shows that 1,200m (0.65nm) is sufficient for safe day VMC access to a helideck with a distance of approximately 1nm to the closest object considered sufficient to climb to 500ft and then turn away from obstacles whilst continuing the climb (further details provided in **Appendix 17.1**) - the minimum 1.5nm distance to the Unconstrained Areas provides for more than this. Night or IMC access would be restricted for both platforms with the Project in place (**Appendix 17.1**). It is noted that due to the opening hours of Blackpool airport (07.00 to 21:00), access impacts would be greatest in the winter months, with night restrictions largely not applicable in the summer months. Analysis of flight data between 2018 and 2022 shows the majority of current flights occur under day VMC (Calder CA-1 81.6% to 94.9%

and CPC-1 85.8% to 94.6%) (**Appendix 17.1**). Scheduling slightly earlier flights would permit impacted flights to be done under day VMC, albeit with a shortened working day on the Calder CA-1 and CPC-1 platforms. Shortening the working day would have potential logistical implications. DP-6 would also be limited to day VMC only once the Project is in place (only under the rule change the CAA is currently consulting on).

17.138 The study also considers other platforms, however it is noted access to the DP-1 (South Morecambe Central Processing Complex) is currently day only and normally only used when CPC-1 is out of wind limits. Platforms beyond those described would not be impacted by the Project, and DP3 and DP4 have been decommissioned (**Appendix 17.1**).

17.139 The sensitivity/value has been assessed as **medium** considering capacity to accommodate the predicted change or interaction.

17.140 With the embedded mitigation described in **Section 17.3.3** the magnitude of impacts to oil and gas platform access (helicopter) has been assessed to be **medium**. The resulting effect has been assessed to be **moderate adverse** and significant in EIA terms, driven by potential impacts to night and IMC helicopter access at the manned CPC-1.

17.141 Importantly, it should be noted that while some CAT flights would be impacted, SAR access would not be reduced as SAR helicopters operate to less restrictive limitations (the Project is required to be compliant with MGN 654, as secured in the draft DCO). The MCA routinely conducts medivac flights and down manning operations when CAT helicopters are not available, when the local airport (operating base) is closed or when the meteorological conditions are outside CAT limits.

Additional mitigation

17.142 Cross-industry collaboration and consultation with the owners and/or operators of the South Morecambe and Calder gas fields (Spirit Energy and Harbour Energy) aims to further address any operational issues to ensure that co-existence between both activities can be achieved with minimal disruption, noting that plans for oil and gas asset decommissioning are likely to be developed. Engagement is ongoing with Harbour Energy and Spirit Energy on the terms of suitable cooperation and coexistence agreements, with protective provisions which make provision for additional costs if required included in the draft DCO for completeness (these are not expected to be required in the current form in addition to the cooperation agreement).

17.143 In addition, should the CAA approve the rule change to CAT flights within 3nm (and so the worst-case assessment in the study (**Appendix 17.1**) is realised), it is noted that applications based on a safety case for IMC access for specific approaches/take-offs and night access under certain conditions may be

approved by the CAA, reducing the impact on access limitations and so minimising the operational impacts identified in the study and assessed above.

Residual effect

17.144 With the implementation of additional mitigation, the magnitude of impacts to oil and gas infrastructure and activities has been assessed to be **low**. The resulting effect on existing oil and gas operations has been assessed to be **minor adverse** and not significant in EIA terms.

Future scenario

17.145 Effects during the Project operation and maintenance phase on potential oil and gas exploration, including CCS activities are likely to be similar to those during construction (**Section 17.6.1.2**), however the duration of effects is increased. The sensitivity/value is **medium**, and magnitude of the effect is **low**. This gives rise to a **minor adverse** effect which is not significant in EIA terms. Engagement would be maintained with oil and gas operators to ensure co-ordination as projects arise.

17.6.2.3 Impact 3: Physical effects on subsea cables and pipelines

17.146 During the operation and maintenance of the Project there would be potential for impacts on existing subsea cables and pipelines within the windfarm site through reduced access and the potential for damage to these assets due to operation and maintenance activities, although potential impacts would be less than during the construction phase. The EXA Atlantic (formerly GTT Hibernia Atlantic) telecommunication cable transects east to west through the centre of the windfarm site and the Vodafone Lanis 1 telecom cable runs along the southern border of the site. Additionally, power cables and pipelines connecting oil and gas infrastructure are also present in the windfarm site (including the DP3 to CPC-1 gas line (not in use)), the Calder to Rivers Onshore Terminal gas line and the Calder CA1 to CPC-1 power cables).

17.147 In line with the embedded mitigation measures (Table 17.3~~Table 17.3~~), access to the telecommunications or power cables for repair or reburial would remain uncompromised during Project operation and maintenance, and WTGs and OSP(s) would not be placed within 500m either side of cables, pipelines or umbilicals, unless agreed otherwise. This secured by protective provisions in favour of the relevant parties in the draft DCO.

17.148 Additionally, the use of crossing and proximity agreements, to be agreed post-consent with the relevant asset owners, would act to ensure access/operations are not hindered.

17.149 With the implementation of embedded mitigation described in **Section 17.5.3** access to oil and gas cables, pipelines and umbilicals would also not be compromised. Should operators wish to install subsea cables or pipelines in

the future that cross or are in close proximity to Project infrastructure it is expected that the Applicant and any such operator would enter into any necessary discussions and agreements.

17.150 If it becomes necessary to replace or repair parts of the existing subsea cables (either that owned by the Applicant or another operator) maintenance activities would be carried out in line with standard industry methods and good practice, and in line with any relevant commercial agreement such that no effect on existing subsea cables and pipelines would occur.

17.151 The sensitivity/value of existing subsea cables and pipelines to disturbance from the operation and maintenance of the Project has been judged to be **high** given the difficulty and costs associated with cable or pipeline repair. With the application of embedded mitigation measures the likelihood of occurrence of damage to third party cables and pipelines is minimal and the magnitude of the effect has been assessed as **negligible**. The effect has been assessed as **minor adverse** which is not significant in EIA terms.

17.6.2.4 Impact 4: Potential effects on disposal and aggregates sites

17.152 There is no direct overlap of any disposal or aggregate sites with the windfarm site and therefore no direct effects would occur. Potential effects on disposal and aggregate sites relate solely to potential interference of the Project infrastructure or maintenance activities with movements of contracted vessels supporting disposal and aggregate operations.

17.153 Any potential conflicts with vessel activities, including increased vessel activity are detailed in **Chapter 14 Shipping and Navigation**.

17.154 As described in **Section 17.6.1.4**, a low use dredger route between Heysham and the Off Skerries TSS passes through the windfarm site. Embedded mitigation measures including the use of NtM and other notifications of planned activity, charting and marking and lighting of Project infrastructure would deconflict the Project and dredger operations and mitigate any impacts to dredgers operating along this route. The overall frequency of movements along this route is low and the required rate of diversion to avoid the windfarm site would be minor. It is therefore considered the potential for disturbance by the Project's operation and maintenance activities on disposal and aggregate operations is limited.

17.155 The sensitivity/value of disposal and aggregate sites disturbance from the operation and maintenance of the Project has been assessed to be **low** with capacity for vessels to accommodate the presence of the Project and any required maintenance activities. With the application of embedded mitigation measures (as outlined in **Table 17.3~~Table 17.3~~** and with further details regarding navigational plans presented in **Chapter 14 Shipping and Navigation**) the magnitude of the effect has been assessed to be **negligible**.

The effect has been assessed as **negligible adverse** effect which is not significant in EIA terms.

17.6.2.5 Impact 5: Potential effects on tourism and recreation

17.156 During the operational phase, tourism and recreation may be affected by the presence of Project infrastructure and any temporary safety zones required for the purposes of major maintenance. There would be temporary 500m safety zones in operation around active maintenance vessels when maintenance or repairs are required. Recreational use of the site, such as for sailing, diving and angling is low, and separation of WTGs would allow passage through the windfarm site. Additionally, there are existing restrictions in place within the vicinity of the windfarm site due to surrounding oil and gas infrastructure.

17.157 The area from which recreational activities may be displaced during Project maintenance activities is likely to be limited with the potential to result in only slight alteration of recreational activity. The frequency of maintenance activities is likely to be low and intermittent over a longer operational period and the magnitude of the effect has been assessed to be **negligible**. As for construction, the sensitivity/value of the receptor has been assessed to be **low**. The effect has been assessed to be **negligible adverse** and not significant in EIA terms.

17.6.2.6 Impact 6: Potential effects on MOD activities

17.158 The sensitivity/value of military activities has been assessed as **high** given national importance. The magnitude of impact during operation and maintenance has been assessed as **negligible** given there are no PEXA or highly surveyed routes that overlap the windfarm site and that any operation and maintenance activities and changes to the seabed would be communicated to the MOD. As described in **Chapter 16 Civil and Military Aviation and Radar** no effects have been identified on radar in relation to MOD assets and suitable mitigations are available for effects to flight procedures. Effects on MOD activities has been assessed as **minor adverse** which is not significant in EIA terms.

17.6.3 Potential effects during decommissioning

17.159 Effects upon infrastructure and other users during decommissioning of the Project are anticipated to be similar to those assessed during the construction phase, with an incremental reduction of effect as infrastructure is removed.

17.160 Decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning. This is likely to include removal of all of the WTG and OSP components, including the foundations above seabed

level. Offshore cables may be left in situ or removed depending on available technology at the time of decommissioning.

17.161 To minimise environmental effects, some of the Project's infrastructure may be disconnected and left in situ on the seabed. For example, scour protection and cable protection may be left in situ.

17.162 It is proposed that the surface infrastructure, the WTGs/OSP(s), would be disconnected and removed from the Project's site for decommissioning onshore.

17.163 Ahead of decommissioning, consultation with operators in the study area, and the approach to removal of infrastructure would be agreed. A full assessment of the effects would be conducted prior to decommissioning, noting the existing environment may have altered from that used in this assessment by the time of decommissioning.

Impact 1: Potential effects on other windfarms or renewables developments

17.164 The sensitivity/value and magnitude of effects would be comparable to those identified for the construction and operation and maintenance phases. Implementing embedded mitigation measures throughout the Project life cycle would further limit effects, and the disturbance effect on existing offshore windfarms from Project decommissioning has been assessed as **minor adverse** and not significant effect in EIA terms.

Impact 2: Potential effects on oil and gas infrastructure and future exploration, including CCS

17.165 The sensitivity/value and magnitude of effects during decommissioning on oil and gas infrastructure and activities, including potential CCS projects would be comparable or less than those identified for the construction phase. A long-term decline in oil and gas production in the Irish Sea is anticipated and future oil and gas decommissioning activities would see the removal of infrastructure and associated safety zones. However, it is acknowledged that there is still the potential for future oil and gas exploration in the Project area, including potential CCS projects.

17.166 The effect significance has been assessed as **minor adverse**. Should any potential development (e.g. of the EIS Area 1) alter the existing environment significantly, then a further assessment would be conducted prior to decommissioning to determine the scale of effect.

Impact 3: Physical effects on subsea cables and pipelines

17.167 The sensitivity/value and magnitude of effects would be comparable to those identified for the construction phase, the effect on existing subsea cables and

pipelines has been assessed as **minor adverse** and not significant in EIA terms.

17.168 To further minimise environmental effects from removal of cabling, the Project offshore (inter-array) cables may be disconnected and left in situ along with associated cable protection measures and subsea structures.

Impact 4: Potential effects on disposal and aggregates sites

17.169 The sensitivity/value and magnitude of effects would be comparable to those identified for the construction phase and as such the effect significance has been assessed as **negligible adverse** and not significant in EIA terms.

Impact 5: Potential effects on tourism and recreation

17.170 The sensitivity/value and magnitude during the period of decommissioning activities would be comparable to those identified for the construction phase. Therefore, the effect has been assessed as **minor adverse** and not significant in EIA terms**,** with impacts removed following decommissioning and the removal of surface infrastructure and safety zones.

Impact 6: Potential effects on MOD activities

17.171 Overall, the effect on MOD activities during decommissioning has been assessed to be comparable to construction and of **minor adverse** significance and not significant in EIA terms.

17.7 Cumulative effects

17.172 In order to undertake the CEA, and as per the PINS advice note (PINS, 2019), the potential for cumulative effects has been established considering each Project-alone effect (and the ZoI of each impact) alongside the list of other plans, projects and activities that could potentially interact. These stages are detailed below.

17.7.1 Identification of potential cumulative effects

17.173 Part of the cumulative assessment process involves the identification of which individual impacts assessed for the Project have the potential for a cumulative effect on receptors (impact screening). This information is set out in **Table 17.19**~~**Table 17.19**~~ and shown in **Figure 17.6**. This screening considered the ZoI of the impacts and the other plans and projects identified in **Table 17.20**~~**Table 17.20**~~.

17.174 Impacts for which the residual significance of effect was assessed in the Project-alone assessment as ‘negligible’, or above, have been considered in the CEA screening (i.e. only those assessed as ‘no change’ have not been

taken forward as there is no potential for them to contribute to a cumulative effect).

Table 17.19 Summary of potential cumulative effects (impact screening)

Impact	'Project-alone' residual effect significance	Potential for cumulative effect	Rationale
All phases			
Impact 1: Potential effects on other windfarms or developments/activities	Minor adverse	Yes	Construction phases may overlap with construction of other plans or projects. There would be overlap of operation activities of existing projects.
Impact 2: Potential effects on oil and gas infrastructure and future exploration	Minor adverse	Yes	Other projects may result in further restricted access to licensed areas/projects.
Impact 3: Physical effect on subsea cables and pipelines	Minor adverse	No	Effects are highly localised within the footprint of each project and crossing agreements and commercial arrangements would be put in place for each project.
Impact 4: Potential effects on disposal and aggregates sites	Negligible adverse	No	There is no overlap with active disposal sites, with potential significant cumulative effects limited to vessels movements which are assessed in **Chapter 14 Shipping and Navigation**.
Impact 5: Potential effect on tourism and recreation	Minor adverse	Yes	Cumulative effects from incremental effects from other projects restricting/displacing activities.
Impact 6: Potential effect on MOD activities	Minor adverse		

17.7.2 Identification of other plans, projects and activities

17.175 The identification and review of the other plans, projects and activities that may result in cumulative effects for inclusion in the CEA (described as 'project screening') was undertaken alongside an understanding of Project-alone effects. For this chapter a 50km distance was used to identify possible projects

as this distance encompasses the ZoI for all relevant impacts, as well as incremental changes over the wider area.

17.176 It should be noted that existing infrastructure, operations and activities within 50km have been considered as part of the baseline and assessed as receptors and therefore not considered cumulative projects.

17.177 Details of the projects screened into cumulative assessment are set out in **Table 17.20~~Table 17.20~~**, including consideration of current status (e.g. under construction), planned construction period, distance to the Project, status of available data and rationale for inclusion in the assessment.

17.178 All projects considered for CEA across all topics have been identified within **Appendix 6.1 CEA Project Long List** (Document Reference 5.2.6.1) which forms an exhaustive list of plans, projects and activities relevant to the Project.

Table 17.20 Summary of projects considered for the CEA in relation to infrastructure and other users

Project	Status (at the time of assessment)	Construction period	Closest distance from the Project (km)	Screened into CEA (Y/N)	Rationale
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	Pre-application stage. PEIR published in October 2023	2026 – 2029	0 (adjacent)	Y	There is the potential for temporal overlap of offshore activities and cumulative effects.
Mona Offshore Wind Project	Pre-application stage. PEIR submitted 2023.	2026 - 2029	10.0	Y	There is the potential for temporal overlap of offshore activities and cumulative effects.
Morgan Offshore Wind Project Generation Assets	Pre-application stage. PEIR submitted 2023.	2026 - 2029	16.7	Y	There is the potential for temporal overlap of offshore activities and cumulative effects.
Awel y Môr Offshore Wind Farm	Consent granted 2023.	2027 - 2030	28.9	Y	There is the potential for temporal overlap of offshore activities and cumulative effects.
Mooir Vannin Offshore Wind Farm	Early planning – Scoping submitted October 2023.	2030 - 2032	43.7	Y	Potential for overlap during the operation of the Project.
Interconnectors	Concept/early planning	Mares Connect - Construction 2025 to be operational by 2027	MaresConnect: 36.2 Isle of Man: Undetermined	N	Several interconnectors are being planned/considered. This includes a second interconnector cable, between the Isle of Man and the UK with one potential offshore cable route/corridor in the vicinity of the Project. Further engagement between the

Project	Status (at the time of assessment)	Construction period	Closest distance from the Project (km)	Screened into CEA (Y/N)	Rationale
					projects would be required if these plans develop. Further, the MaresConnect is a proposed 750MW subsea and underground electricity interconnector system linking the electricity grids in Ireland and Great Britain (with connection into north Wales) and south of the windfarm site. Given the location of this project and the information available no significant effects are identified.

17.7.3 Assessment of cumulative effects

17.179 Having established the residual effects from the Project with the potential for a cumulative effect, along with the other relevant plans, projects and activities, the following sections provide an assessment of the level of cumulative effect that may arise. These are detailed per impact where the potential for cumulative effects have been identified (in line with **Table 17.19~~Table 17.19~~**).

17.180 Given the interconnected nature of the Project and the Transmission assets, a separate combined assessment of these is provided within the CEA (**Section 17.7.3.1**). Thereafter, the cumulative assessment considers all plans, projects and activities screened into the CEA (**Section 17.7.3.2**).

17.181 Cumulative aviation effects are assessed in **Chapter 16 Civil and Military Aviation and Radar** and cumulative navigation effects are considered in detail in **Chapter 14 Shipping and Navigation**. This chapter considers overall effects to infrastructure operators and other users.

17.7.3.1 Cumulative assessment – Generation and Transmission Assets (combined assessment)

17.182 While the Transmission Assets are being considered in a separate ES as part of a separate DCO application (combined with the Morgan Offshore Wind Project transmission assets), given the functional link, a 'combined' assessment has been made considering both the Project and Transmission Assets for the purposes of cumulative assessment. This provides an assessment including impact interactions and additive effects and thus any change in the significance of effects as assessed separately.

17.183 The Transmission Assets PEIR (Morgan Offshore Wind Limited and Morecambe Offshore Windfarm Ltd, 2023) informs the assessment. The assessment was also undertaken in reference to the baseline presented in **Section 17.6**.

17.184 Only marine elements of the Transmission Assets[9] would interact with the Project in relation to other marine users, including:

- Export cables adjoining the windfarm sites and making landfall south of Blackpool
- Booster station required for the Morgan Offshore Wind Project

[9] As the Transmission Assets includes infrastructure associated with both the Project and the Morgan Offshore Wind Project Generation Assets, it should be noted that the combined assessment considers the transmission infrastructure for both the Project and the Morgan Offshore Wind Project Generation Assets (and includes all infrastructure as described in the Transmission Assets PEIR).

- OSP(s) (for the Project and Morgan Offshore Wind Project)

17.185 The following impacts to infrastructure and other users (project-alone) were concluded in the Transmission Assets PEIR (Morgan Offshore Wind Limited and Morecambe Offshore Windfarm Ltd, 2023):

- Displacement of recreational activities (all phases) – **Negligible to minor adverse**
- Increased suspended sediment concentrations and associated deposition affecting recreational diving sites and designated bathing water sites (all phases) **– Negligible to minor adverse**
- Impacts to existing cables or pipelines or restrictions on access to cables or pipelines (all phases) – **Minor adverse**
- Increased suspended sediment concentrations and associated deposition affecting aggregate areas (all phases) – **Negligible adverse**
- Alterations to sediment transport pathways affecting aggregate areas (all phases) – **Negligible adverse**
- Reduction or restriction of oil and gas activities (including surveys, decommissioning, CCS and underground gas storage) (all phases) – **Negligible to minor adverse**

17.186 It is noted that appropriate communications and mitigations with other users would be in place for both the Project and the Transmission Assets. While all effects are additive between the Project and the Transmission Assets, due to the localised effects and embedded mitigations, there would be no material change in significance of effects when considering the impacts together. However, a key interaction identified would result from the interaction of the potential booster station associated with the Morgan Offshore Wind Project and the nearby oil and gas infrastructure and shipping navigation. While this infrastructure is not part of Morecambe Project infrastructure, given the limited scale of the booster station no effects have been identified that would be materially elevated above the Project-alone assessment and no additional mitigation is required[10].

17.187 Key interactions and additive effects between the Project and the Transmission Assets have been considered with no identification of cumulative effects that would result in impacts of greater significance than assessed for either the Project or the Transmission Assets. A summary is

[10] At the time of writing this ES decision had been taken since the PEIR that the Morgan booster station (OBS) would no longer be required. Whilst the OSPs, OBS and interconnector cables will not form part of the DCO Application for the Transmission Assets, but they are included here as they were contained within the Transmission Asset PEIR which is has been used to inform this this ES.

provided in Table 17.21~~Table 17.21~~ considering all effects from the Project and the Transmission Assets

Table 17.21 Summary of residual impacts from the Project and Transmission Assets assessments and combined assessments (note: wording of impacts has been summarised to encompass both projects)

Impact	Transmission Assets significance of effect	Project-alone significance of effect	Combined assessment
Construction/decommissioning phases			
Potential effects on other windfarms or developments/ activities	No change	Minor adverse	While additive in nature across the study area, and some receptors could experience effects from the Project and the Transmission Assets, the cumulative effects are not considered to be elevated beyond each Project-alone assessment in terms of EIA significance.
Potential effects on oil and gas infrastructure and future exploration	Minor adverse	Minor adverse	
Physical effects on subsea cables and pipelines	Minor adverse	Minor adverse	
Potential effects on disposal and aggregates site	Negligible adverse	Negligible adverse	
Potential effects on tourism and recreation	Minor adverse	Minor adverse	
Potential effects on MOD activities	No change	Minor adverse	
Increased suspended sediment concentrations and associated deposition affecting recreational diving sites and designated bathing water sites	Minor adverse	N/A - outside ZoI	
Operation and maintenance phase			
Potential effects on other windfarms or developments/ activities	No Change	Minor adverse	While additive in nature across the study area, and some receptors could experience effects from the Project and the Transmission Assets, the significance of cumulative effects are not considered to be elevated beyond
Potential effects on oil and gas infrastructure and future exploration	Negligible adverse	Minor adverse	

Impact	Transmission Assets significance of effect	Project-alone significance of effect	Combined assessment
Physical effects on subsea cables and pipelines	Minor adverse	Minor adverse	each Project-alone assessment in terms of EIA significance.
Potential effects on disposal and aggregates site	Minor adverse	Negligible adverse	
Potential effects on tourism and recreation	Negligible adverse	Negligible adverse	
Potential effects on MOD activities	No change	Minor adverse	
Increased suspended sediment concentrations and associated deposition affecting recreational diving sites and designated bathing water sites	Negligible adverse	N/A outside ZoI	

17.7.3.2 Cumulative assessment - All plans and projects

17.188 Based on the impacts (**Section 17.6**) and plans and projects (**Table 17.20~~Table 17.20~~**) identified where there is the potential for cumulative effects, a detailed cumulative assessment is undertaken considering all relevant information from the Project and other plans and projects (including the Transmission Assets).

7.1.1.1.1 Cumulative effects during construction, operation and decommissioning on other windfarms or renewable developments

17.189 The Mona Offshore Wind Project is located approximately 10.0km west of the Project, and the Morgan Offshore Wind Project Generation Assets are located approximately 16.7km to the northwest. Morgan and Morecambe Offshore Wind Farms: Transmission Assets are proposed to overlap (and lie adjacent) to the Project. Awel y Môr Offshore Wind Farm is located approximately 28.9km south of the Project and the proposed Mooir Vannin Offshore Wind Farm is approximately 43.7km to the northwest of the Project.

17.190 The separation of the projects would mitigate impacts to wake effects. A recent study (Frazer-Nash, 2023) identified that at a greater than 10km separation between windfarms there is a levelling off of total interaction loss with buffer distance and by 20km the wake losses become 'vanishingly small'. The Project sits at a greater distance than 10km from other windfarm sites and therefore not considered further. Embedded mitigation measures (including site selection, the use of NtM and other notifications of planned activity, appropriate lighting, marking and charting of each windfarm and marine co-ordination of all offshore windfarm activities) is standard industry practice and expected to also be followed by the other offshore windfarm projects in addition to the Transmission Assets. As such the cumulative effects have been assessed to be no greater than Project-alone effects.

17.7.3.3 Potential effects during construction, operation and decommissioning on oil and gas infrastructure and future exploration, including CCS

17.191 Cumulative effects on oil and gas infrastructure may occur if existing infrastructure (and associated operations) with the potential to be impacted by the Project-alone are also affected by other proposed windfarm sites or developments. In such a scenario, potential effects may arise from:

- Increased vessels and helicopter movements during all phases of development
- Introduction of safety zones on vessel activities
- Impeded access to oil and gas assets due to presence of the windfarm sites or other developments
- Potential restrictions on helicopter access to oil and gas infrastructure

17.192 Cumulative impacts to helicopter access to nearby platforms are assessed in **Appendix 17.1**. No cumulative impact was determined between either the Mona Offshore Wind Farm and the Morgan Offshore Wind Farm Generation Assets and the Project. The cumulative effects in relation to access to oil and gas infrastructure have been assessed to be no greater than Project-alone effects, given the mitigations identified by all projects. Specific detailed assessments undertaken in relation to REWS (**Appendix 17.2**) to determine whether there is any impact to the system operated by the oil and gas infrastructure also included a cumulative assessment which identified no significant effects, with effects not materially elevated from the Project-alone assessment. The study concluded the impact of the Project on detection performance of nearby REWS installations is low and manageable without the need for further mitigation measures. The modelling results for the Project also indicate that the assessed REWS platforms would not experience a change in yearly alarm rates as a result of rerouted traffic and there would be no negative impact from the Project on microwave communication links.

17.193 The Transmission Assets (offshore infrastructure) are in proximity to existing oil and gas infrastructure. Agreements would be put in place between operators by each project as required during all development phases and would limit any cumulative effects. As such the cumulative effects are not considered to be greater than Project- alone effects.

17.194 Potential impacts on future oil and gas exploration and development activities, including potential CCS development have been considered. Overlap of other offshore windfarm developments with CCS areas is limited, for example the EIS Area 1 which overlaps with the Project windfarm site does not overlap with the windfarm sites for Mona, Morgan, Awel y Môr or Mooir Vannin OWFs. Whilst the Transmission Assets do cross through EIS Area 1, crossing and/or proximity agreements would be put in place between operators where required and would act to reduce the potential cumulative effects. Cumulative effects are therefore not predicted beyond Project-alone effects.

17.195 It is expected that all projects would reach agreements with the affected operators (including proximity and crossing agreements) and as such that cumulative effects would remain the same as the Project-alone effects.

17.7.3.4 Potential effects on tourism and recreation and MOD activities during construction, operation and decommissioning

17.196 With the potential for construction of a number of windfarms in the eastern Irish Sea there is the potential for cumulative effects on tourism and recreation and MOD activities. Cumulative effects on recreation are likely to be limited as the level of recreational activities such as for sailing, diving and angling in the study area is low with relatively few cruising routes passing within the study area (**Chapter 14 Shipping and Navigation** and **Appendix 14.2**) with most concentrated near shore and/or clear of project array areas. Overall impacts have been assessed to remain as per Project-alone effects.

17.197 Relevant mitigation measures including site selection, NtM (and other notifications of planned activity), appropriate lighting, marking and charting and marine co-ordination of activities are embedded in the Project and it is expected that similar measures would be adopted by other projects.

17.198 There is no interaction with the Project and PEXA or highly surveyed routes so would not contribute to an cumulative effects in the study area.

17.8 Transboundary effects

17.199 Transboundary effects for infrastructure and other users relate only to cables owned by international operators. These have been considered in **Section 17.6** and no other transboundary effects are considered likely to occur.

17.9 Inter-relationships

17.200 There are clear inter-relationships between the infrastructure and other marine users topic and several other topics that have been considered within this ES. Table 17.22~~Table 17.22~~ provides a summary of the principal inter-relationships and sign-posts to where those issues have been addressed in the relevant chapters.

Table 17.22 Infrastructure and other users inter-relationships

Topic and description	Related chapter	Where addressed in this chapter	Rationale
All project phases			
Impact 1: Potential effects on other windfarms or developments/ activities	**Chapter 14 Shipping and Navigation** details effects on vessel movement **Chapter 16 Civil and Military Aviation and Radar** details effects on aviation	**Section 17.6** considers effects on access and operations	Vessels in transit and helicopter operations are considered to feed into the overall assessment of the asset
Impact 2: Potential effects on oil and gas infrastructure and future exploration	**Chapter 14 Shipping and Navigation** details effects on vessel movement **Chapter 16 Civil and Military Aviation and Radar** details effects on aviation transit	**Section 17.6** considers effects related to access and operations	Vessels in transit and helicopter operations are considered to feed into the overall assessment of the asset
Impact 4: Potential effects on disposal and aggregates site	**Chapter 14 Shipping and Navigation** details effects on vessel movement	**Section 17.6** considers effects on overall access and operations	Vessels in transit are considered to feed into the overall assessment of the asset
Impact 5: Potential effect on tourism and recreation	**Chapter 20 Socio-economics, Tourism and Recreation** is informed by this chapter in identifying potential effects to marine recreation	**Section 17.6** considers displacement effects to recreational users	The displacement to activities is identified in this chapter and inform the associated socio-economic assessment
Impact 6: Potential effects on MOD activities	**Chapter 16 Civil and Military Aviation and Radar** assesses	**Section 17.6 considers** impacts to MOD maritime	MOD activities are separated between aviation and maritime due to the

Topic and description	Related chapter	Where addressed in this chapter	Rationale
	aviation and radar impacts. **Chapter 14 Shipping and Navigation** informs maritime activities assessed in this chapter	and aviation and radar operations	differentiation between these activities and operations

17.10 Interactions

17.201 The impacts identified and assessed in this chapter have the potential to interact with each other. However, in this case there are no potential interactions between effects on infrastructure and other users described in this chapter as these are all separate, non-related receptors. Considering all phases of the Project (lifetime assessment), no effects have been identified that would be greater than each individually assessed.

17.11 Potential monitoring requirements

17.202 Monitoring requirements are be described in the outline in principle monitoring plan (IPMP) (Document Reference 6.4) submitted alongside the DCO Application and would be further developed and agreed with stakeholders prior to construction based on the IPMP and taking account of the final detailed design of the Project.

17.203 Navigation control measures which are relevant to other marine users are outlined in the NRA (**Appendix 14.1**). No further monitoring is proposed in relation to infrastructure and other users given that all of the potential impacts considered would result in at worse, minor adverse effects on infrastructure and other users, with the application of all relevant mitigation measures. The conclusions can be made with a high degree of certainty due to the accumulation of evidence from a range of studies and consultation.

17.12 Assessment summary

17.204 This chapter has provided a characterisation of the existing environment for infrastructure and other users which, alongside detailed assessment of effects on shipping and navigation and aviation and radar. The assessment, and commitment to embedded and additional mitigation, has established that the residual effects on infrastructure and other users during the construction, operation and maintenance and decommissioning phases of the Project are considered at most minor adverse.

17.205 However, the ongoing engagement is noted with Harbour Energy and Spirit Energy on the terms of a suitable cooperation and coexistence agreement, along with the protective provisions which make provision for additional costs if required and which are included in the draft DCO for completeness (further noting these are not expected to be required in the current form in addition to the cooperation agreement).

17.206 A summary of the assessment is presented in **Table 17.23**~~**Table 17.23**~~.

Table 17.23 Summary of potential effects on infrastructure and other users

Potential impact	Receptor	Value/ sensitivity	Magnitude	Significance of effects	Additional mitigation measures proposed	Residual effect	Cumulative residual effect
Construction phase							
Impact 1: Potential effects on or arising from other windfarms or renewable developments	Windfarm operations	Medium	Low	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone
Impact 2: Potential effects on oil and gas infrastructure and future exploration, including CCS	Oil and gas activities	Medium (existing) Medium (future exploration)	Low - Medium	Significant (Moderate adverse) (existing) Minor adverse (future exploration))	Co-existence agreement / protective provisions	Not significant (Minor adverse)	As per Project-alone
Impact 3: Physical effects on subsea cables and pipelines	Sub-sea cables	High	Negligible	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone
Impact 4: Potential effects on disposal and aggregates site	Disposal and aggregate operations	Low	Negligible	Not significant (Negligible adverse)	None	Not significant (Negligible adverse)	As per Project-alone
Impact 5: Potential effects on tourism and recreation	Recreational boating, angling, diving	Low	Low	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone

Potential impact	Receptor	Value/ sensitivity	Magnitude	Significance of effects	Additional mitigation measures proposed	Residual effect	Cumulative residual effect
Impact 6: Potential effects on MOD activities	Maritime, aviation and radar activities	High	Negligible	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone
Operation and maintenance phase							
Impact 1: Potential effects on or arising from other windfarms or renewable developments	Windfarm operations	Medium	Low	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone
Impact 2: Potential effects on oil and gas infrastructure and future exploration, including CCS	Oil and gas activities	Medium (existing) Medium (future exploration, including CCS)	Low - Medium	Significant (Moderate adverse) (existing) Minor adverse (future exploration))	Co-existence agreement / protective provisions	Not significant (Minor adverse)	As per Project-alone
Impact 3: Physical effects on subsea cables and pipelines	Sub-sea cables	High	Negligible	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone
Impact 4: Potential effects on disposal and aggregates site	Disposal and aggregate operations	Low	Negligible	Not significant (Negligible adverse)	None	Not significant (Negligible adverse)	As per Project-alone

Potential impact	Receptor	Value/ sensitivity	Magnitude	Significance of effects	Additional mitigation measures proposed	Residual effect	Cumulative residual effect
Impact 5: Potential effects on tourism and recreation	Recreational boating, angling, diving	Low	Negligible	Not significant (Negligible adverse)	None	Not significant (Negligible adverse)	As per Project-alone
Impact 6: Potential effects on MOD activities	Maritime, aviation and radar activities	High	Negligible	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone
Decommissioning phase							
Impact 1: Potential effects on or arising from other windfarms or renewable developments	Windfarm operations	Medium	Negligible	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone
Impact 2: Potential effects on oil and gas infrastructure and future exploration, including CCS	Oil and gas activities	Medium (existing) Medium (future exploration, including CCS)	Low	Not significant (Minor adverse) (existing) Minor (future exploration)	None	Not significant (Minor adverse)	As per Project-alone
Impact 3: Physical effects on subsea cables and pipelines	Sub-sea cables	High	Negligible	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone

Potential impact	Receptor	Value/ sensitivity	Magnitude	Significance of effects	Additional mitigation measures proposed	Residual effect	Cumulative residual effect
Impact 4: Potential effects on disposal and aggregates site	Disposal and aggregate operations	Low	Negligible	Not significant (Negligible adverse)	None	Not significant (Negligible adverse)	As per Project-alone
Impact 5: Potential effects on tourism and recreation	Recreational boating, angling, diving	Low	Low	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone
Impact 6: Potential effects on MOD activities	Maritime, aviation and radar activities	High	Negligible	Not significant (Minor adverse)	None	Not significant (Minor adverse)	As per Project-alone

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