

# **Outer Dowsing Offshore Wind Preliminary Environmental Information Report**

## **Volume 1, Chapter 18: Infrastructure and Other Marine Users**

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## Abbreviations

Acronym	Expanded name
BEIS	Department for Business Energy and Industrial Strategy (now the Department for Energy Security and Net Zero (DESNZ))
BMAPA	British Marine Aggregate Producers Association
CAA	Civil Aviation Authority
CAT	Commercial Air Transport
CCUS	Carbon Capture, Usage and Storage
CEA	Cumulative Effects Assessment
CSIP	Cable Specification and Installation Plan
CTV	Crew Transfer Vessel
DCO	Development Consent Order
DECC	Department of Energy & Climate Change, now the Department for Energy Security and Net Zero (DESNZ)
Defra	Department for Environment, Food and Rural Affairs
DEP	Dudgeon Extension Project
DESNZ	Department for Energy Security and Net Zero, formerly Department of Business, Energy and Industrial Strategy (BEIS), which was previously Department of Energy & Climate Change (DECC)
DLUHC	Department for Levelling Up, Housing and Communities
EC	European Commission
ECC	Export Cable Corridor
EDF	Électricité de France S.A.
EEA	European Economic Area
EEZ	Exclusive Economic Zones
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Topic Group
ETI	Energy Technology Institute
GT R4 Ltd	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development and TotalEnergies
GIS	Geographical Information System
GW	GigaWatts
HDD	Horizontal Directional Drill
HVDC	High Voltage Direct Current
IOMU	Infrastructure and Other Marine Users
IPC	Infrastructure Planning Commission
JUV	Jack Up Vessel
LOS	Line of Sight
LSE	Likely Significant Effect
MCA	Maritime and Coastguard Agency
MCAA	Marine and Coastal Access Act

Acronym	Expanded name
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MOD	Ministry of Defence
MPS	Marine Policy Statement
MT	Mega Ton
NEP	Northern Endurance Partnership
nm	Nautical Miles (1nm = 1,852 metres)
NPS	National Policy Statement
NSTA	North Sea Transition Authority
ODOW	Outer Dowsing Offshore Wind
OGA	Oil and Gas Authority
OP	Offshore Platform
ORCP	Offshore Reactive Compensation Platform
OREI	Offshore Renewable Energy Installation
OSS	Offshore Substation
OTNR	Offshore Transmission Network Review
OWF	Offshore Windfarm
PEIR	Preliminary Environmental Information Report
REWS	Radar Early Warning System
SAR	Search and Rescue
SNS	Southern North Sea
SoS	Secretary of State
SOV	Service Operations Vessel
TCE	The Crown Estate
TH	Trinity House
UK	United Kingdom
UKCS	United Kingdom Continental Shelf
UKHO	United Kingdom Hydrographic Office
UKSAP	UK Storage Appraisal Project
UXO	Unexploded Ordnance
VMC	Visual Meteorological Conditions
VMP	Vessel Management Plan
WTG	Wind Turbine Generator
ZoI	Zone of Influence

## Terminology

Term	Definition
Array area	The area offshore within the PEIR Boundary within which the generating stations (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling are positioned.
Baseline	The status of the environment at the time of assessment without the development in place.
Carbon Capture Usage and Storage	The process of producing carbon dioxide artificially (burning fossil fuels or other chemical/biological processes), trapping it before it is released to the atmosphere, and then storing it in the ground or seabed.
Cumulative effects	The combined effect of the Project acting cumulatively with the effects of a number of different projects, on the same single receptor/resource.
Cumulative impact	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with the Project.
Project Design envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of an impact with the sensitivity of a receptor, in accordance with defined significance criteria.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	The suite of documents that detail the processes and results of the Environmental Impact Assessment (EIA).
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Inter-array cables	Cable which connects the wind turbines to each other and to the offshore substation(s).
Landfall	The location at the land-sea interface where the offshore export cable will come ashore.
Maximum Design Scenario	The maximum design parameters of the combined project assets that result in the greatest potential for change in relation to each impact assessed.

Term	Definition
Mitigation	Mitigation measures, or commitments, are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
National Policy Statement (NPS)	A document setting out national policy against which proposals for Nationally Significant Infrastructure Projects (NSIPs) will be assessed and decided upon
Non-statutory consultee	Organisations that the Applicant may be required to (under Section 42 of the 2008 Act) or may otherwise choose to engage during the pre-application phases (if, for example, there are planning policy reasons to do so) who are not designated in law but are likely to have an interest in a proposed development.
Offshore Export Cable Corridor (ECC)	The Offshore Export Cable Corridor (Offshore ECC) is the area within the Preliminary Environmental Information Report (PEIR) Boundary within which the export cable running from the array to landfall will be situated.
Offshore Reactive Compensation Station (ORCP)	Platforms located outside the array area which house electrical equipment and control and instrumentation systems. They also provide access facilities for work boats.
Preliminary Environmental Information Report (PEIR)	The PEIR is written in the style of a draft Environmental Statement (ES) and provides information to support and inform the statutory consultation process in the pre-application phase. Following that consultation, the PEIR documentation will be updated to produce the Project's ES that will accompany the application for the Development Consent Order (DCO).
PEIR Boundary	The PEIR Boundary is outlined in Figure 3.1 of Volume 1, Chapter 3: Project Description and comprises the extent of the land and/or seabed for which the PEIR assessments are based upon.
Pre-construction and post-construction	The phases of the Project before and after construction takes place.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Statutory consultee	Organisations that are required to be consulted by the Applicant, the Local Planning Authorities and/or The Inspectorate during the pre-application and/or examination phases, and who also have a statutory responsibility in some form that may be relevant to the Project and the DCO application. This includes those bodies and interests prescribed under Section 42 of the Planning Act 2008.  Not all prescribed bodies and interests will be statutory consultees (see non-statutory consultee definition).



Term	Definition
Study area	Area(s) within which environmental impact may occur – to be defined on a receptor by receptor basis by the relevant technical specialist.
Subsea	Subsea comprises everything existing or occurring below the surface of the sea.
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
The Project	Outer Dowsing Offshore Wind including proposed onshore and offshore infrastructure
Transboundary impacts	Transboundary effects arise when impacts from the development within one European Economic Area (EEA) state affects the environment of another EEA state(s).
Wind turbine generator (WTG)	All the components of a wind turbine, including the tower, nacelle, and rotor.

## 18 Infrastructure and Other Marine Users

### 18.1 Introduction

- 18.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the results to date of the Environmental Impact Assessment (EIA) process for the potential impacts of Outer Dowsing Offshore Wind ("the Project") on Infrastructure and Other Marine Users (IOMU). Specifically, this chapter considers the potential impact of the Project seaward of Mean High Water Springs (MHWS) during the construction, operation and maintenance, and decommissioning phases.
- 18.1.2 GT R4 Ltd (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant', is proposing to develop the Project. The Project will be located approximately 54km from the Lincolnshire coastline in the southern North Sea. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm), export cables to landfall, onshore cables, and connection to the electricity transmission network, and ancillary and associated development (see Volume 1, Chapter 3: Project Description for full details).
- 18.1.3 Activities and infrastructure considered in this chapter include:
- Offshore renewables;
  - Oil and gas infrastructure (including pipelines);
  - Carbon Capture Usage and Storage (CCUS);
  - Subsea cables;
  - Nuclear energy facilities;
  - Coastal and marine waste water assets;
  - Aggregate dredging licensed areas; and
  - Marine disposal sites.
- 18.1.4 Marine and coastal recreational activities and water sports have not been considered within this chapter, and are instead covered within Volume 1, Chapter 15: Shipping and Navigation and Volume 1, Chapter 29: Socio-Economic Characteristics.
- 18.1.5 This PEIR chapter should be read in conjunction with the following chapters and appendices:
- Volume 1, Chapter 7: Marine Processes;
  - Volume 1, Chapter 13: Marine and Intertidal Archaeology;
  - Volume 1, Chapter 14: Commercial Fisheries;
  - Volume 1, Chapter 15: Shipping and Navigation
  - Volume 1, Chapter 16: Aviation, Radar, Military and Communication
  - Volume 1, Chapter 24: Hydrology and Flood Risk (coastal flood defence); and
  - Volume 1, Chapter 29: Socio-Economic Characteristics.

## **18.2 Statutory and Policy Context**

- 18.2.1 This section identifies the legislation, policy and other documentation that has informed the assessment of effects with respect to IOMU. Full details are provided in Volume 1, Chapter 2: Need, Policy and Legislative Context.
- 18.2.2 The relevant legislation and planning policy for offshore renewable energy NSIPs, specifically in relation to IOMU, is outlined in Table 18.1

Table 18.1: Legislation and policy context

Legislation/ Policy	Key provisions	Section where comment addressed
<b>Legislation</b>		
United Nations Convention on the Law of the Sea (UNCLOS) – Article 79: Submarine cables and pipelines on the continental shelf.	This article protects submarine cables and requires signatories to have due regard for any existing cables or pipelines in position and not prejudice the possibilities of repair.	Submarine cables and pipelines in the vicinity of the Project are detailed within Section 18.4 (with reference to Figure 18.6)) and potential impacts on these receptors are assessed in Section 18.7. Additionally, embedded mitigation measures relevant to cables and pipelines are set out in Table 18.12.
The Submarine Telegraph Act (1885).	The Submarine Telegraph Act brings the Submarine Telegraphs Convention into force into the UK and makes it an offence to break or injure any submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication.	
Energy Act (2004).	This act sets out the basic requirements for applying a safety zone to be placed around or adjacent to an Offshore Renewable Energy Installation (OREI). Applications for safety zones must be made to the relevant authority. In this case, it will be the Department for Energy Security and Net Zero (DESNZ).	Safety zones are included in the embedded mitigation measures within Table 18.12.
<b>Policy</b>		
NPS for Renewable Energy (EN-3) (DECC, 2011).	Sets out guidance and requirements for nationally significant energy infrastructure projects.	
	EN-3, Paragraph 2.6.35: There may be constraints imposed on the siting or design of offshore windfarms because of restrictions resulting from the presence of other offshore infrastructure or activities.	Embedded mitigation measures are set out in Table 18.12. Site selection is addressed in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives.

Legislation/ Policy	Key provisions	Section where comment addressed
	EN-3, Paragraph 2.6.179: Where a potential offshore windfarm 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 Project should undertake an assessment of the potential effect 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 windfarm in accordance with the appropriate policy for offshore windfarm EIAs.	Section 18.7 considers the potential effects on existing infrastructure and activities considering each phase of the development process.
	EN-3, Paragraph 2.6.180: Applicants should engage with interested parties in the potentially affected offshore sectors early in the development phase of the proposed offshore windfarm, with an aim to resolve as many issues as possible prior to the submission of an application to the Infrastructure Planning Commission (IPC) (now known as The Inspectorate).	Consultation with potentially affected stakeholders has been carried out from the early stages of the project and throughout the pre-application consultation process. Details of the consultation are summarised in Section 18.3, with further information on the Project consultation process in Volume 1, Chapter 6: Consultation.
	EN-3, Paragraphs 2.6.182 and 2.6.183: There are statutory requirements concerning automatic establishment of navigational safety zones relating to offshore petroleum developments and that, where a proposed offshore windfarm potentially affects other offshore infrastructure or activity, a pragmatic approach should be employed; the Applicant should be expected to minimise negative impacts and reduce risks to as low as reasonably practicable.	The Project has been sited to minimise disruption to other offshore infrastructure or activities, where possible. In cases where potential disruption has been identified, the Applicant has, in consultation with relevant operators and where appropriate and feasible, provided mitigation measures to reduce or negate impacts. This is discussed further within Section 18.7. Further information is provided in Volume 1, Chapter 3: Site Selection and Consideration of Alternatives.

Legislation/ Policy	Key provisions	Section where comment addressed
		Additionally, embedded mitigation measures are set out in Section 18.5.
	EN-3, Paragraph 2.6.184: As such, the IPC should be satisfied that the site selection and site design of the proposed offshore windfarm has been made with a view to avoiding or minimising disruption or economic loss or any adverse effect on safety to other offshore industries. The IPC should not consent applications which pose unacceptable risks to safety after mitigation measures have been considered.	Site selection is addressed in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives. The PEIR Boundary has been refined since scoping with consideration given to minimising disruption, economic loss or any adverse effect on safety to other offshore industries. Additionally, embedded mitigation measures are set out in Table 18.12.
	EN-3, Paragraph 2.6.185: Where a proposed development is likely to affect the future viability or safety of an existing or approved/licensed offshore infrastructure or activity, the IPC should give these adverse effects substantial weight in its decision-making.	Section 18.7 considers the potential effects on existing or approved/licensed offshore infrastructure and activities. The assessment demonstrates that there will be no significant effects on viability or safety associated with existing or approved/licensed assets following the implementation of mitigation.
	EN-3, Paragraph 2.6.186: Providing proposed schemes have been carefully designed by the applicants, and that the necessary consultation with relevant bodies 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 IPC to grant consent.	Site selection is addressed in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives. The PEIR Boundary has been refined since scoping with consideration given to minimising disruption, economic loss or any adverse effect on safety to other offshore industries. In cases where potential disruption has been identified, the Applicant has, in consultation with relevant operators, provided appropriate controls to minimise disruption or any adverse effects on safety. Additionally,

Legislation/ Policy	Key provisions	Section where comment addressed
		embedded mitigation measures are set out in Table 18.12.
	EN-3, Paragraph 2.6.187: Detailed discussions between the Project for the offshore windfarm and the relevant consultees should have progressed as far as reasonably possible prior to the submission of an application to the IPC. As such, appropriate mitigation should be included in any application to the IPC, and ideally agreed between the relevant parties.	The Project have undertaken consultation with a number of stakeholders, which is detailed in Section 18.3. Where there is potential for significant effects on IOMU, following PEIR consultation, the Project will continue to consult with the relevant parties to (as noted above) seek agreement on appropriate controls.
Draft revised NPS for Renewable Energy Infrastructure EN-3 (DESNZ, 2023).	Draft revised NPS EN-3, Paragraph 3.8.56: There may be constraints imposed on the siting or design of offshore windfarms 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 electrolyzers for hydrogen production, marine aggregate dredging, telecommunications, or activities, such as aviation and recreation.	Embedded mitigation measures are set out in Table 18.12. Site selection is addressed in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives.
	Draft revised NPS EN-3, Paragraph 3.8.58: Applicants should consult the Government's Marine Plans which are a useful information source of existing activities and infrastructure.	The Government's Marine Plans have been considered within the establishment of the baseline environment, set out in Section 18.4.
	Draft revised NPS EN-3, Paragraph 3.8.59: Prior to the submission of an application involving the development of the seabed, applicants should engage with The Crown Estate 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.	The Project have engaged with The Crown Estate throughout the project design process, through the Round Four leasing process and via the application for an Agreement for Lease for the export cable corridor, to ensure efficient use of the seabed and co-existence with other users.

Legislation/ Policy	Key provisions	Section where comment addressed
	Draft revised NPS EN-3, Paragraph 3.8.60: 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 find solutions to facilitate to greater co-existence/co-location.	Consultation with potentially affected stakeholders has been carried out from the early stages of the project and throughout the pre-application consultation process. Details of the consultation are summarised in Section 18.3, with further information on the Project consultation process in Volume 1, Chapter 6: Consultation.
	Draft revised NPS EN-3, Paragraphs 3.8.213 -3.8.215: Where a potential offshore windfarm 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 windfarm in accordance with the appropriate policy and guidance for offshore windfarm EIAs. Applicants should use marine plans in considering which activities may be most affected by their proposal and thus where to target their assessment.	Section 18.7 considers the potential effects on existing infrastructure and activities considering each phase of the development process. The Government's Marine Plans have been considered within the establishment of the baseline environment, set out in Section 18.4.
	Draft revised NPS EN-3, Paragraphs 3.8.216 and 3.8.219: Applicants should engage with interested parties in the potentially affected offshore sectors early in the pre-application phase of the proposed offshore windfarm, with an aim to resolve as many issues as possible prior to the submission of an application. Such engagement should be	Consultation with potentially affected stakeholders has been carried out from the early stages of the project and throughout the pre-application consultation process. Details of the consultation are summarised in Section 18.3, with further information on the Project



Legislation/ Policy	Key provisions	Section where comment addressed
	taken to ensure that solutions are sought that allow offshore windfarms and other uses of the sea to successfully co-exist.	consultation process in Volume 1, Chapter 6: Consultation.
	Draft revised NPS EN-3, Paragraph 3.8.278: Detailed discussions between the applicant for the offshore windfarm 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.	The Project have undertaken consultation with a number of stakeholders, which is detailed in Section 18.3. Where there is potential for significant effects on IOMU, following PEIR consultation, the Project will continue to consult with the relevant parties to (as noted above) seek agreement on appropriate controls.
	Draft revised NPS EN-3, Paragraphs 3.8.359 and 3.8.360: There are statutory requirements concerning automatic establishment of navigational safety zones relating to offshore petroleum developments. Where a proposed offshore windfarm potentially affects other offshore infrastructure or activity, a pragmatic approach should be employed by the Secretary of State.	The Project has been sited to minimise disruption to other offshore infrastructure or activities, where possible. Further information is provided in Volume 1, Chapter 3: Site Selection and Consideration of Alternatives. Additionally, embedded mitigation measures are set out in Section 18.5
	Draft revised NPS EN-3, Paragraphs 3.8.362 – 3.8.3.64: 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 the proposed offshore windfarm 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. The Secretary of State should not	Site selection is addressed in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives. The PEIR Boundary has been refined since scoping with consideration given to minimising disruption, economic loss or any adverse effect on safety to other offshore industries. In cases where potential disruption has been identified, the Applicant has, in consultation with relevant operators and where appropriate and feasible, provided mitigation measures to reduce or negate impacts. This is discussed further within

Legislation/ Policy	Key provisions	Section where comment addressed
	consent applications which pose intolerable risks to safety after mitigation measures have been considered.	Section 18.7. Additionally, embedded mitigation measures are set out in Table 18.12.
	Draft revised NPS EN-3, Paragraph 3.8.365: 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.	Section 18.7 considers the potential effects on existing or approved/licensed offshore infrastructure and activities. The assessment demonstrates that there will be no significant effects on viability or safety associated with existing or approved/licensed assets following the implementation of mitigation.
	Draft revised NPS, EN-3: Paragraph 3.8.366: 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.	Site selection is addressed in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives. The PEIR Boundary has been refined since scoping with consideration given to minimising disruption, economic loss or any adverse effect on safety to other offshore industries. In cases where potential disruption has been identified, the Applicant has, in consultation with relevant operators, provided appropriate controls to minimise disruption or any adverse effects on safety. Additionally, embedded mitigation measures are set out in Table 18.12.
UK Marine Policy Statement (MPS).	The MPS is the framework for preparing Marine Plans and taking decisions affecting the marine environment. It contributes to the achievement of sustainable development in the United Kingdom marine area. It was prepared and adopted for the purpose of section 44 of the Marine and Coastal Access Act 2009.	The Applicant has considered the relevant Marine Plan in establishing the baseline environment (Section 18.4) and within the impact assessment in Section 18.7.

Legislation/ Policy	Key provisions	Section where comment addressed
East Inshore and East Offshore Marine Plans (EMP) (Department for Environment, Food and Rural Affairs (DEFRA), 2014).	<p>EMP, AGG1: Proposals in areas where a licence for extraction of aggregates has been granted or formally applied for should not be authorised unless there are exceptional circumstances. The exceptional circumstances are:</p> <ul style="list-style-type: none"> <li>▪ Where the aggregates company that holds the lease allows another party to use that area either for aggregate extraction or another use; or</li> <li>▪ Where it is determined that the location should be licensed for oil and gas development.</li> </ul> <p>Changes to the lease would be subject to agreement with the lease holder.</p>	Marine aggregate sites have been identified within the existing environment section of this chapter (Paragraph 18.4.38 <i>et seq.</i> ).
	<p>EMP, AGG3: Within defined areas of high potential aggregate resources, proposals should demonstrate in order of preference:</p> <ol style="list-style-type: none"> <li>a) That they will not prevent aggregate extraction;</li> <li>b) How, if there are adverse impacts on aggregate extraction, they will minimise these;</li> <li>c) How, if the adverse impacts cannot be minimised, they will be mitigated;</li> <li>d) The case for proceeding with the application if it is not possible to minimise or mitigate the adverse impacts.</li> </ol>	Marine aggregate sites have been identified within the existing environment section of this chapter (Paragraph 18.4.38 <i>et seq.</i> ). Section 18.7 identifies where likely significant effects have been determined and where mitigation is proposed. Details of consultation to date with relevant operators is provided in Table 18.2 with discussions ongoing.
	<p>EMP, DD1: Proposals within or adjacent to licensed dredging and disposal areas should demonstrate, in order of preference:</p> <ol style="list-style-type: none"> <li>a) That they will not adversely impact dredging and disposal activities;</li> <li>b) How, if there are adverse impacts on dredging and disposal, they will minimise these;</li> <li>c) How, if the adverse impacts cannot be minimised, they will be mitigated;</li> </ol>	Marine dredging and disposal sites have been identified within the existing environment section of this chapter (Paragraph 18.4.38 <i>et seq.</i> ). Section 18.7 identifies where likely significant effects have been determined and where mitigation is proposed. Details of consultation to date with relevant operators is

Legislation/ Policy	Key provisions	Section where comment addressed
	d) The case for proceeding with the proposal if it is not possible to minimise or mitigate the proposed impacts.	provided in Table 18.2 with discussions ongoing.
	EMP, OG1: Proposals within areas with existing oil and gas production should not be authorised except where compatibility with oil and gas production and infrastructure can be satisfactorily demonstrated.	This chapter identifies and assesses in section 18.7.44 <i>et seq.</i> compatibility with oil and gas production infrastructure.
	EMP, CAB1: Preference should be given to proposals for cable installation where the method of installation is burial. Where burial is not achievable, decisions should take account of protection measures for the cable that may be proposed by the applicant.	Where possible, cables will be buried, to a minimum target burial depth of 1m (Table 18.12).
Other Documentation		
Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 (MCA, 2016).	Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response. This guidance highlights issues to be taken into consideration when assessing the impact on navigational safety and emergency response caused by OREI developments. It includes guidance on marine cable protection and burial within UK waters. Should water depths be reduced by more than 5% (due to cable protection) of Chart Datum then further consultation would be required.	This chapter (Section 18.7) identifies where likely significant effects have been determined, including issues that may impact navigational safety. Details of embedded mitigation, including the use of a Traffic Management Plan (TMP), are provided in Table 18.12. A full navigational safety assessment is provided in Volume 1, Chapter 15: Shipping and Navigation.
International Association of Marine Aids to Navigation (AtoN) and Lighthouse Authorities (IALA), Recommendation O- 139 on the marking of man-made	These recommendations apply to all offshore structures and/or platforms and make specific reference to OWFs and are required for safe navigation, protection of the environment and protection of the structures themselves.	This PEIR (Section 18.7) identifies where likely significant effects have been determined, including issues that may impact navigational safety. Details of embedded mitigation including lighting and marking design, are provided in Table 18.12.

Legislation/ Policy	Key provisions	Section where comment addressed
offshore structures, Edition 2 (IALA, 2013).		A full navigational safety assessment is provided in Volume 1, Chapter 15: Shipping and Navigation and project design features are outlined in Volume 1, Chapter 3: Project Description.

18.2.3 In addition to the NPSs and Marine Plans, there is a variety of other policy and guidance documents which may be relevant to the consideration of impacts on IOMU assets; the following list provides examples of potentially relevant policies and guidance which will be given further consideration in completing the assessment for the final ES:

- CAP 764 Civil Aviation Agency (CAA) Policy and Guidelines on Wind Turbines; and
- Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response Navigational Practice, Safety and Emergency Response.

### 18.3 Consultation

18.3.1 Consultation is a key part of the Development Consent Order (DCO) application process. Consultation regarding IOMU has been conducted through direct consultation with relevant stakeholders and the EIA scoping process (ODOW, 2022). An overview of the Project consultation process is presented within Volume 1, Chapter 6: Consultation.

18.3.2 A summary of the key issues raised during consultation to date, specific to IOMU, is outlined in Table 18.2 below, together with how these issues have been considered in the production of this PEIR. Consultation with relevant asset owners and operators is ongoing.

Table 18.2: Summary of consultation relating to IOMU

Date and consultation phase/type	Consultation and key issues raised	Section where comment addressed
Scoping Opinion, the Inspectorate September 2022	<b>Effects on OWFs – Construction, O&amp;M, and Decommissioning.</b> It is noted that the Triton Knoll OWF is surrounded by the ECC search area, the potential exists for construction, maintenance and decommissioning activities to therefore be carried out within its vicinity. In the absence of further refinement of the ECC at this stage, the Inspectorate advises that the ES should include an assessment of impacts on this OWF and associated infrastructure where significant effects could occur.	Information on this receptor is provided in Paragraph 18.4.7 and Table 18.4.
Scoping Opinion, the Inspectorate September 2022	<b>Effects on wave and tidal energy sites – Construction, O&amp;M, and Decommissioning.</b> The Scoping Report proposes to scope out effects on wave and tidal energy sites for all phases of the Proposed Development on the grounds that there is no overlap with any existing or proposed infrastructure. The Inspectorate is content to scope this matter out of further assessment.	These receptors have been scoped out of assessment, as outlined in Paragraph 18.4.8.

Date and consultation phase/type	Consultation and key issues raised	Section where comment addressed
Scoping Opinion, the Inspectorate September 2022	<p><b>Effects on oil and gas assets subject to decommissioning – Construction, O&amp;M, and Decommissioning.</b></p> <p>The Applicant proposes to scope out effects on oil and gas assets that are subject to decommissioning. Provided the oil and gas platforms set to be commissioned are fully removed prior to commencement of construction of the Proposed Development, the Inspectorate agree that this matter can be scoped out as significant effects are unlikely to occur.</p>	As set out in Section 18.4, the Applicant can confirm that all oil and gas assets that are subject to decommissioning will be fully removed prior to the commencement and as such, this impact is scoped out of the EIA process.
Scoping Opinion, the Inspectorate September 2022	<p><b>Effects on oil and gas assets or activity from the installation and operation of the offshore export cable – Construction, O&amp;M, and Decommissioning.</b></p> <p>The Scoping Report seeks to scope out effects on oil and gas assets and activities as there will be no overlap with the various existing activities following the refinement of the ECC. In the absence of further refinement of the ECC at this stage, the Inspectorate advises that the ES should include an assessment of impacts on oil and gas assets and activities, where likely significant effects could occur.</p>	Assessment of potential impacts of the Project on effects on oil and gas assets are presented in Section 18.7.
Scoping Opinion, the Inspectorate September 2022	<p><b>Effects on Carbon Capture Utilisation and Storage (CCUS) – Construction, O&amp;M, and Decommissioning.</b></p> <p>The Scoping Report proposes to scope out this matter on the basis that there will be no overlap with the Northern Endurance Partnership (NEP) planned CCUS connecting infrastructure or any interaction with other CCUS infrastructure following refinement of the ECC. Paragraph 7.12.26 of the Scoping Report however states that although the main Endurance site lies outside of the IOMU study area, it is understood that some infrastructure to connect to the Humber region may be required and could therefore interact with the study area.</p>	This receptor has been scoped out of assessment, as outlined in Paragraph 18.4.29 <i>et seq.</i>

Date and consultation phase/type	Consultation and key issues raised	Section where comment addressed
	The ES should provide an assessment of the potential effects on CCUS for all phases of the Proposed Development where significant effects are likely to occur. Should the desk study assessment and further consultations proposed establish that there would be no overlap with the NEP/planned CCUS, the Inspectorate would agree this matter could be scoped out of the assessment.	
Scoping Opinion, the Inspectorate September 2022	<b>Effects on nuclear facilities – Construction, O&amp;M, and Decommissioning.</b> On the basis that there is no overlap in nuclear infrastructure and facilities, coupled with the distance to the nearest nuclear facility at Sizewell in Suffolk, the Inspectorate is content to scope this matter out of further assessment.	As set out in Paragraph 18.4.32, the Applicant can confirm that there is no overlap between the IOMU study area and any nuclear infrastructure and facilities and as such, this impact is scoped out of the EIA process.
Scoping Opinion, the Inspectorate September 2022	<b>Effects on wastewater assets, marine disposal, and aggregate dredging – Construction, O&amp;M, and Decommissioning.</b> The Scoping Report seeks to scope out these matters as there will be no overlap with the various existing activities following the refinement of the ECC. However, the absence of further refinement of the ECC at this stage, the Inspectorate advises that the ES should include an assessment of impacts related to these matters where significant effects could occur.	Assessment of potential impacts of the Project on effects on marine disposal and aggregate dredging are presented in Section 18.7 with reference to Figure 18.1. Wastewater assets have been scoped out of assessment, as outlined in Paragraph 18.4.35.
Scoping Opinion, the Inspectorate September 2022	<b>Transboundary impacts.</b> The Scoping Report seeks to scope this matter out of further assessment on the grounds that the any impacts on IOMU receptors would be localised and all receptors lie wholly within the UK EEZ. The Inspectorate notes the presence of the Viking Link cable on Figure 7.12.5 currently under construction that passes through the nearshore part of the study area and connects from Bicker Fen in Lincolnshire to	Transboundary effects are considered in Section 18.10.

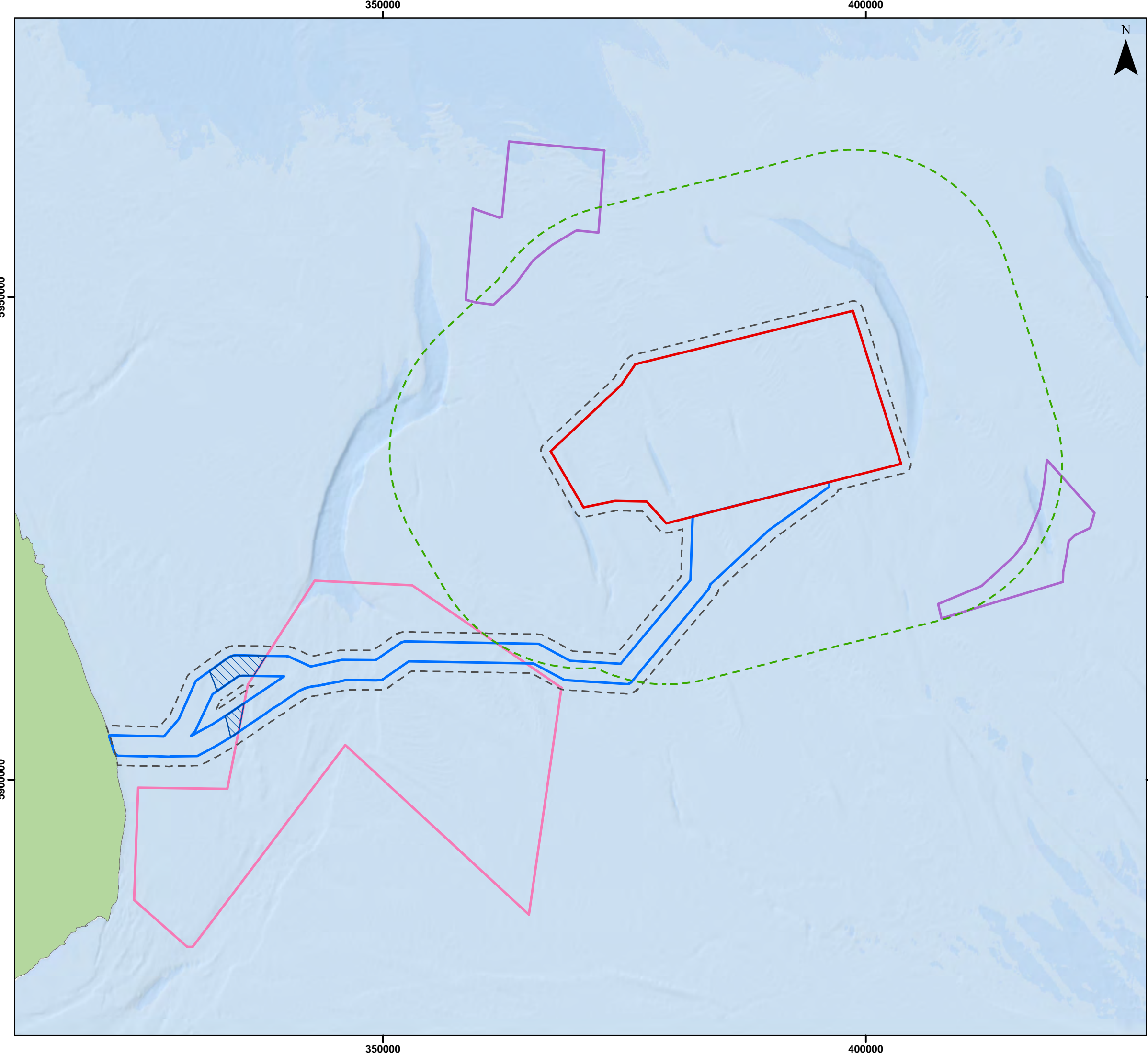


Date and consultation phase/type	Consultation and key issues raised	Section where comment addressed
	the substation at Revsing in southern Jutland, Denmark. The ES should consider whether there would be any likely effects on interconnector cables and include an assessment where likely significant effects could occur.	
Scoping Opinion, the Inspectorate September 2022	<b>Study area.</b> The Scoping Report identifies a maximum Zone of Influence (Zol) of 15km, which relates to the area over which suspended sediments may be detected following disturbance as a result of construction activities, or the area within which significant underwater noise may be detectable as a result of foundation piling events. However, this distance is not explicitly stated in the Physical Processes section of the Scoping Report. Notwithstanding that this figure is subject to refinement as site specific modelling is undertaken, the ES should include a clear justification of the study area and Zol for the IOMU aspect chapter.	The study area for IOMU is justified and defined in paragraph 18.4.1 <i>et seq.</i>
Shipping and Navigation Hazard Workshop, Boskalis Aggregate (Westminster Gravels Ltd)	<b>Marine Aggregate Dredging</b> Aggregate activity will continue to become more intense in the area in coming years but will be limited to the boundary of the already assigned dredging areas so minimal impact will occur.	Impacts on aggregate dredging activities are considered in Section 18.4.
Bilateral discussions - Perenco	<b>Decommissioning plans for the operators, survey works and initial discussions for helicopter aspects.</b>	Perenco assets and planned activities are considered in Section 18.4.
Bilateral discussions - Shell	<b>Decommissioning plans for the operators, survey works and initial discussions for helicopter aspects.</b>	Shell assets and planned activities are considered in Section 18.4.
Bilateral discussions - Hansons	<b>Survey works, licensing plans for aggregates sites and potential for coexistence.</b>	Hansons assets and planned activities are considered in Section 18.4.

## 18.4 Baseline Environment

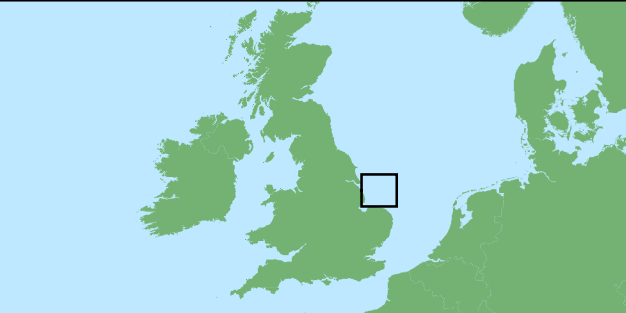
### Study Area

- 18.4.1 The study area is presented in Figure 18.1 and varies in scale depending on the particular receptor and/or potential impact being considered. For each receptor described in this chapter, the spatial variability has been considered and an appropriate baseline description of that receptors study area is provided. The justification for these study areas is outlined below.
- For impacts associated with helicopter access, the study area extends 9 nautical miles (nm) (16.67km) around the Project array area. This is consistent with Civil Aviation Authority (CAA) guidance (CAA, 2016), which suggests a consultation zone of 9nm around offshore helicopter destinations. This consultation zone does not present an area within which the development of Project infrastructure cannot occur but rather is intended as a trigger for consultation with offshore helicopter operators, the operators of existing installations and the holders of oil and gas exploration and development licences in order to help ensure safe offshore helicopter operations. The buffer is not applicable to the offshore ECC where infrastructure with the potential to affect the safety of helicopter operations (i.e. Wind Turbine Generators (WTGs)) will not be installed. As outlined in Volume 1, Chapter 16: Aviation, Radar and Military and Communication, stationary offshore infrastructure associated with the Project (including offshore substations, Offshore Reactive Compensation Platforms (ORCPs) and the accommodation platform) do not pose any issue to radar systems. This study area is referred to as the Helicopter Access Study Area, and is shown on Figure 18.1.
  - For all other impacts, this is limited to the Project PEIR Boundary (including the array area and the offshore ECC) and 1km around these areas. The 1km buffer has been applied in order to ensure the full assessment of IOMU receptors which may have a physical overlap with Project infrastructure. The buffer is based on 500m safety zones which are typically implemented around, for example, active oil and gas infrastructure, and the use of 500m safety zones around Project infrastructure during construction and certain maintenance operations. This study area is referred to as the Direct Study Area, and is shown on Figure 18.1
- 18.4.2 Activities and infrastructure in the wider region, outside the study areas defined above, have been presented in the relevant figures within Section 18.4 in order to provide regional context.
- 18.4.3 These study areas may be reviewed and amended for ES submission in response to potential refinement of the offshore ECC, feedback from consultees, and/or refinements to the Project design envelope.
- 18.4.4 Areas of search for potential compensation measures associated with the Project have been provided in Figure 18.1. The compensation areas will be assessed within the Environmental Statement (ES) following refinement of the proposed areas and once details of the works to be undertaken have been finalised and as such are not currently considered within the baseline for this chapter at PEIR.

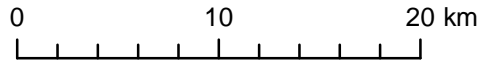


**Legend**

- Array Area
- Offshore Export Cable Corridor
- ORCP Search Area
- Artificial Nesting Structure Search Area
- Biogenic Reef Restoration Search Area
- Direct Study Area
- Helicopter Access Study Area



Coordinate System: WGS 1984 UTM Zone 31N



Scale: 1:375,000

Preliminary Environmental Information Report

Infrastructure and Other Marine Users  
Study Area

Figure 18.1



Date: 20/04/2023  
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Revision: 0.1



Contains ESRI Basemapping;  
Esri, Garmin, GEBCO, NOAA  
NGDC, and other contributors

## Data Sources

- 18.4.5 An initial desk-based review of the data sources has been undertaken to identify existing and proposed IOMU that may potentially be impacted by Project infrastructure and activities associated with the construction, operation and decommissioning of the Project. The key data sources identified are summarised in Table 18.3. As part of the EIA process, the Applicant will continue to undertake consultation with relevant developers, operators and marine users within the study area to identify any other planned developments relating to the Project.
- 18.4.6 In addition, consultation with The Crown Estate (TCE) as well as other licensing authorities will be undertaken to identify any other future developments within the study area.

**Table 18.3: Data sources used to inform the IOMU PEIR assessment**

Source	Summary	Spatial Coverage of Study Areas
TCE offshore wind leasing sites – Rounds 1-4 (September 2021).	Includes OWF array sites.	This is a national dataset providing full coverage of the study areas.
TCE offshore wind cable agreements (February 2023)	Export cables for offshore windfarm agreements/	This is a national dataset providing full coverage of the study areas.
TCE offshore tidal stream and wave site agreements and cable agreements (July 2021).	Includes tidal and wave power sites and export cable routes.	This is a national dataset providing full coverage of the study areas.
NSTA interactive map of all offshore oil and gas activity including license blocks (surface and sub-surface) (March 2023).	Oil and gas infrastructure and licence blocks.	This is a national dataset providing full coverage of the study areas.
OSPAR Inventory of Offshore Installations (2017).	Oil and gas infrastructure including the type and status.	This is a national dataset providing full coverage of the study areas.
TCE offshore natural gas storage site agreements (March 2021).	Includes sites licensed for hydrogen and gas storage.	This is a national dataset providing full coverage of the study areas.
NTSA Carbon Storage Licensing Round shapefiles (NTSA, 2022) ; and The UK Storage Appraisal Project strategic study of the potential for UK carbon dioxide (CO <sub>2</sub> ) storage (2016).	Includes CCUS sites and available lease areas.	These are both national datasets providing full coverage of the study areas.
World Nuclear Association: nuclear power in the UK (November 2021).	Includes Nuclear power station sites.	This is a national dataset providing full coverage of the study areas.
Kingfisher Information Service – Cable Awareness (KIS-ORCA) displays used and abandoned	Includes offshore subsea electricity inter-connector and	This is a national dataset providing full coverage of the study areas.

Source	Summary	Spatial Coverage of Study Areas
cables (May 2021); and Ocean Wise Marine Themes (December 2021).	telecoms cables and gas pipelines.	
EC Waste Water Treatment Works (UWWTD, UK) (accessed November 2021, data not provided with date); Ocean Wise Marine Themes storm overflows (December 2021); and Rivers Trust storm overflows (March 2021).	Includes coastal waste water assets including waste water treatment works and storm overflows.	These are both national datasets providing full coverage of the study areas.
Cefas – GIS Shapefile of Disposal Sites (September 2021).	Includes disposal sites.	This is a national dataset providing full coverage of the study areas.
TCE Aggregate licence area and current working areas (September 2021); and TCE and British Marine Aggregate Producers Association (BMAPA) dredge reports (2021).	Includes marine aggregate extraction licensed areas.	These are both national datasets providing full coverage of the study areas.
Marine Management Organisation - Marine Case Management System Public Register	Public register of marine licence applications in the vicinity of the IOMU study area.	This is a national dataset providing full coverage of the study areas.

## Existing Environment

### Offshore Windfarms

18.4.7 The Zone of Influence (Zoi) for all impacts considered on OWFs is the Direct Study Area, as shown in Figure 18.1. OWFs outside this area, although shown in Figure 18.2 in order to provide regional context, have not been considered further in this assessment. There is no spatial overlap of any other OWFs within the Project array area. The following OWFs (proposed or operational) have been identified in the Direct Study Area, as presented in Figure 18.2 and Table 18.4.

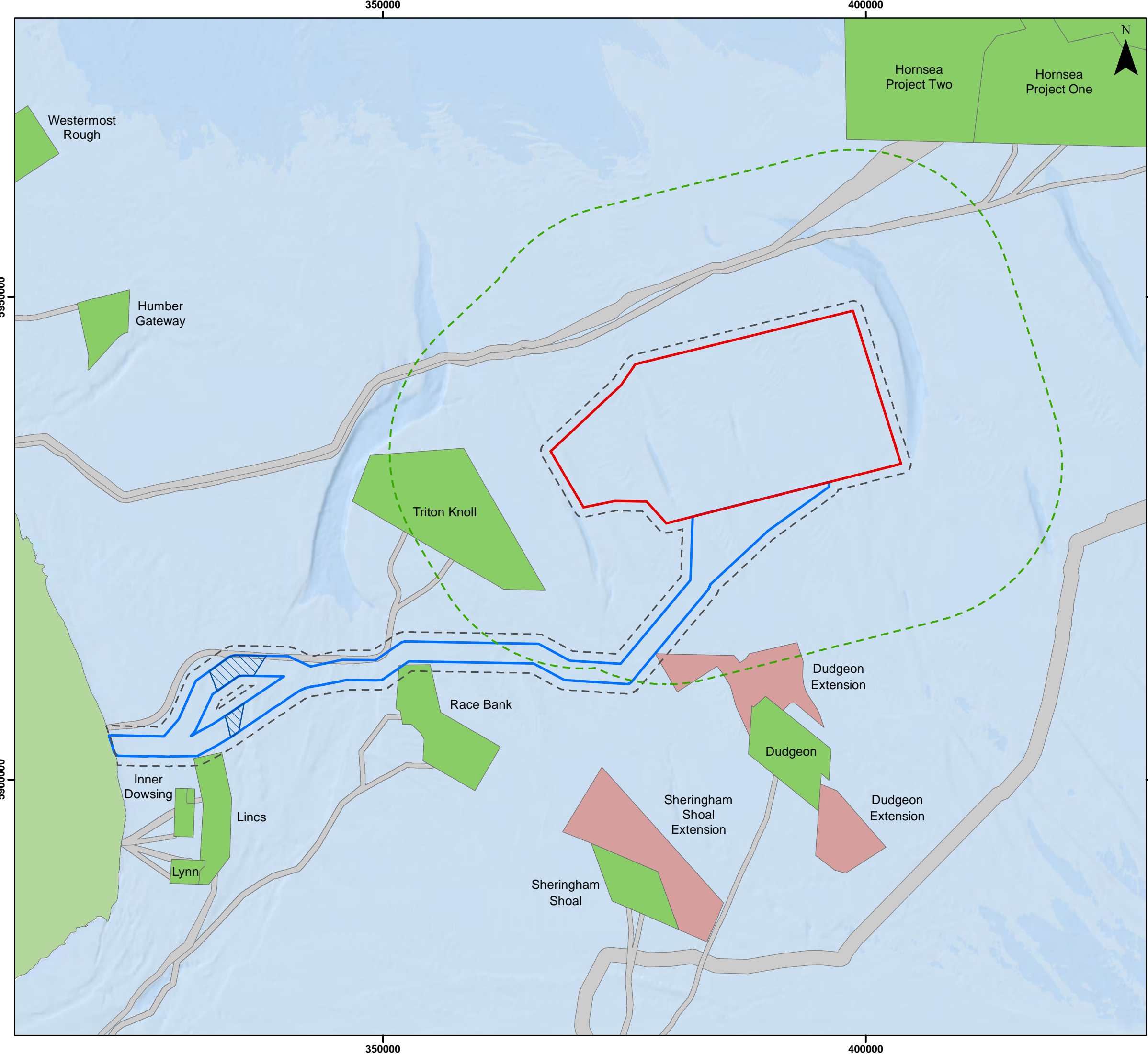
- Triton Knoll OWF (operational) is located approximately 32km off the Lincolnshire coast, with the export cable running southwest to make landfall to the north of Anderby Creek, within 1km of the Project landfall. The Project ECC is adjacent to the Triton Knoll export cable, although there is no proposed crossing of the Project export cables and the Triton Knoll export cable. There is no interaction with the Triton Knoll array area.



- Race Bank OWF (operational) is located approximately 27.3km from Blakeney Point on the North Norfolk Coast, with the export cable making landfall east of the Nene River. There is an overlap between the Race Bank array area and the Project's 1km buffer around the ECC.
- Lincs OWF (operational) is situated 8km off the east coast of the UK, near Skegness in Lincolnshire. There is an overlap between the Lincs OWF array area and the Project's 1km buffer around the ECC.
- Dudgeon Extension Project (DEP) (proposed) is being progressed as part of the 2017 Crown Estate extensions round, with the project currently going through the Inspectorate Examination process. If granted consent, the DEP array area will overlap with the 1km buffer around the Project ECC.

Table 18.4: OWFs in the IOMU Direct Study Area

OWF	Operator	Infrastructure in Area	Distance from Project Array Area (km)	Distance form Project ECC (km)
Operational				
Triton Knoll	Triton Offshore Windfarm Ltd	Knoll Export Cable	14.3	0.0
Race Bank	Race Bank Windfarm Ltd	Array Area	22.8	0.0
Lincs	Lincs Windfarm Ltd	Array Area	45.2	0.2
Under Examination				
Dungeon Extension	Dudgeon Extension Ltd	Array Area	13.5	0.0



### Legend

- Array Area
- Offshore Export Cable Corridor
- ORCP Search Area
- Direct Study Area
- Helicopter Access Study Area
- Windfarm (Operational)
- Windfarm (In Planning)
- Windfarm Cable Agreement

Coordinate System: WGS 1984 UTM Zone 31N

0 10 20 km

Scale: 1:375,000

Preliminary Environmental Information Report

Offshore Windfarms

Figure 18.2

OUTER DOWSING OFFSHORE WIND

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Revision: 0.1

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Esri, Garmin, GEBCO, NOAA  
NGDC, and other contributors

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## Wave and Tidal Energy

- 18.4.8 There are no identified wave or tidal stream energy development sites, existing or planned, within 200km of the Project (TCE, 2021). This distance is outside both study areas, as outlined in Paragraph 18.4.1 and shown on Figure 18.1. Therefore, as agreed within the Scoping Opinion, impacts on wave and tidal energy installations have been scoped out of assessment and are not considered further.

## Oil and Gas Activity including Pipelines

### Oil and Gas Licence Blocks

- 18.4.9 Licences for the exploration and extraction of oil and gas on the United Kingdom Continental Shelf (UKCS) have been offered since 1964 and are granted by the North Sea Transition Authority (NTSA) (previously known as the Oil and Gas Authority (OGA)). These licences are granted for identified geographical United Kingdom Hydrographic Office (UKHO) areas (blocks and sub-blocks) in consecutive rounds, with the most recent being the 32nd Offshore Licensing Round (blocks offered September 2020). The 33rd Offshore Licensing Round closed for applications in January 2023, with licences to be awarded from Q2 of 2023.
- 18.4.10 The main type of offshore licence is the Innovative Licence. This is a new licence introduced by the OGA (now the NTSA) for the 29th Licensing Round which replaces the traditional Seaward Production Licence. The Innovative Licence may cover the whole, or part of a specified block or a group of blocks and grants exclusive rights to the holders "to search and bore for, and extract, petroleum" (including gas) in the area covered by the licence. The initial term is variable, runs for a maximum of nine years, and is subdivided into three phases:
- Phase A (optional) is a period for carrying out geotechnical studies and geophysical data reprocessing;
  - Phase B (optional) is a period for undertaking seismic surveys and acquiring other geophysical data; and
  - Phase C (mandatory) is for drilling.
- 18.4.11 There is a mandatory requirement to relinquish 50% of the licence block after the initial term. The second term is for field development and lasts four years and the third term is for production. The traditional licence terms still apply to licences gained prior to the 29th Licensing Round for which the initial term is four years, which can then be renewed for a further four years with a third term for production. Exclusive rights may also include retained rights within an existing licenced acreage. Other licences available for applicants include Production Licences and Exploration Licences. A Production Licence, which except in special circumstances, runs for three successive terms and covers both exploration and production. An Exploration Licence grants rights to explore only, not to produce; and is non-exclusive. This licence is useful for seismic contractors who wish to gather data to sell rather than to exploit geological resources, and to Production Licence holders who wish to explore beyond the areas where they hold or require exclusive rights.



18.4.12 The largest ZoI for all impacts considered on oil and gas licence blocks is the Direct Study Area, as shown in Figure 18.1. Licence blocks outside this area, although shown in Figure 18.2 in order to provide regional context, have not been considered further in this assessment. There are currently ten licence blocks coinciding with the Direct Study Area, as presented in Figure 18.3 and Table 18.7.

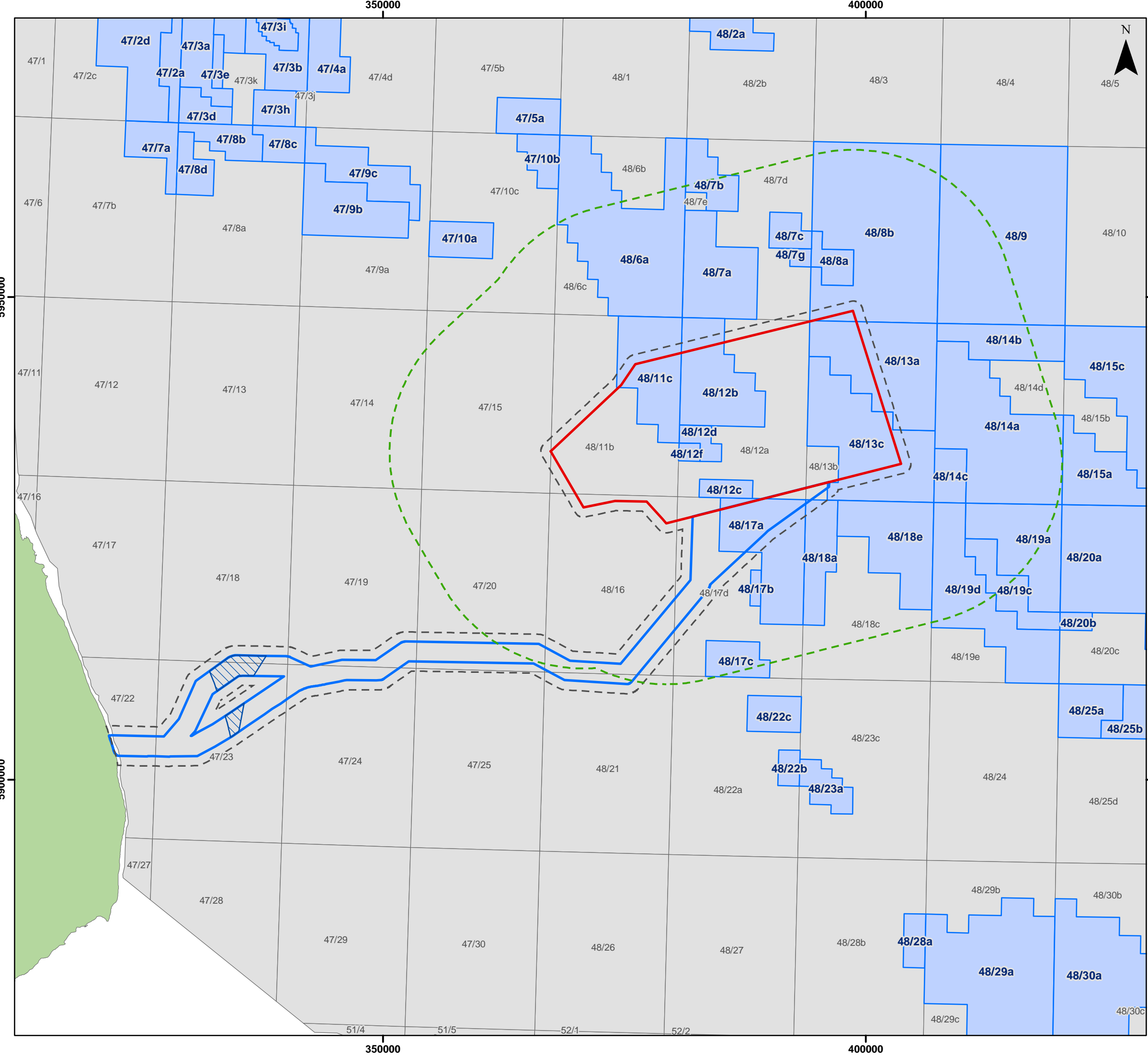
Table 18.5: Current licensed blocks coinciding with the IOMU Direct Study Area

Licence Block	Licence	Type	Licence End Date	Operator
Within the Direct Study Area				
48/8b	P2437	Production	October 1, 2046	Shell PLC
48/11c	P2438	Production	October 1, 2043	IOG PLC
48/12b				
48/12c	P461	Production	Extant, no end date listed	Perenco Oil & Gas
48/12f				
48/12d	P844	Production	July 3, 2029	Perenco Oil & Gas
48/13a	P8	Production	Extant, no end date listed	Ineos Industries, Shell PLC, Harbour Energy PLC, Spirit Energy
48/13c				
48/17a				
48/18a	P2585	Production	December 1, 2048	No Operator
48/17a	P25	Production	Extant, no end date listed	Perenco Oil & Gas
48/18a				

### Hydrocarbon Fields

18.4.13 Areas with hydrocarbon potential have been extensively explored, with many fields brought into production in the southern North Sea. It is generally agreed that the majority of large fields in shelf depth waters (<200m) have already been discovered in the 1960s and 1970s (DECC, 2016). However, technological advances in seismic processing and drilling techniques mean there is still the potential for new hydrocarbon fields to be discovered. Due to the geology of the area, the hydrocarbon fields in the vicinity of the Project are gas or gas condensate fields rather than oil fields.

18.4.14 Known hydrocarbon fields in the proximity of the Project are shown in Figure 18.4. The ZoI for all impacts considered on hydrocarbon fields is the Direct Study Area, as shown in Figure 18.1. There are seven hydrocarbon fields which overlap with the Direct Study Area, as presented in Figure 18.4 and Table 18.6.



### Legend

- Array Area
- Offshore Export Cable Corridor
- ORCP Search Area
- Direct Study Area
- Helicopter Access Study Area
- Licensed Block
- Unlicensed Block

Coordinate System: WGS 1984 UTM Zone 31N

0 10 20 km

Scale: 1:375,000

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Oil and Gas Licence Blocks

Figure 18.3

Date: 20/04/2023  
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Revision: 0.1

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Table 18.6: Hydrocarbon fields located within the IOMU Direct Study Area

Field Name	Resource	Status	Discovery Date	Discovery Well	Production Date	Operator	Licence
Pickerill	Gas	Production ceased	1984/12	48/11b-4	1992/08	Arco	P460 - P037
Malory	Gas	Producing	1997/01	48/12d-9	1998/10	Perenco	P844 - P461
Galahad	Gas	Production ceased	1975/12	48/12-2	1996/11	Perenco	P142
Mordred	Gas	Production ceased	1989/02	48/12b- 6	1997/05	Perenco	P461 - P025
Barque	Gas	Producing	1983/05	48/13a-4	1990/09	Shell PLC	P008
Barque South	Gas	Producing	1992/03	48/13a-B8Z	1995/01	Shell PLC	P008
Excalibur	Gas	Producing	1988/02	48/17a-4	1994/08	Perenco	P025 - P463
Guinevere	Gas	Production ceased	1988/05	48/17b-5	1993/06	Perenco	P463

### Survey Activity

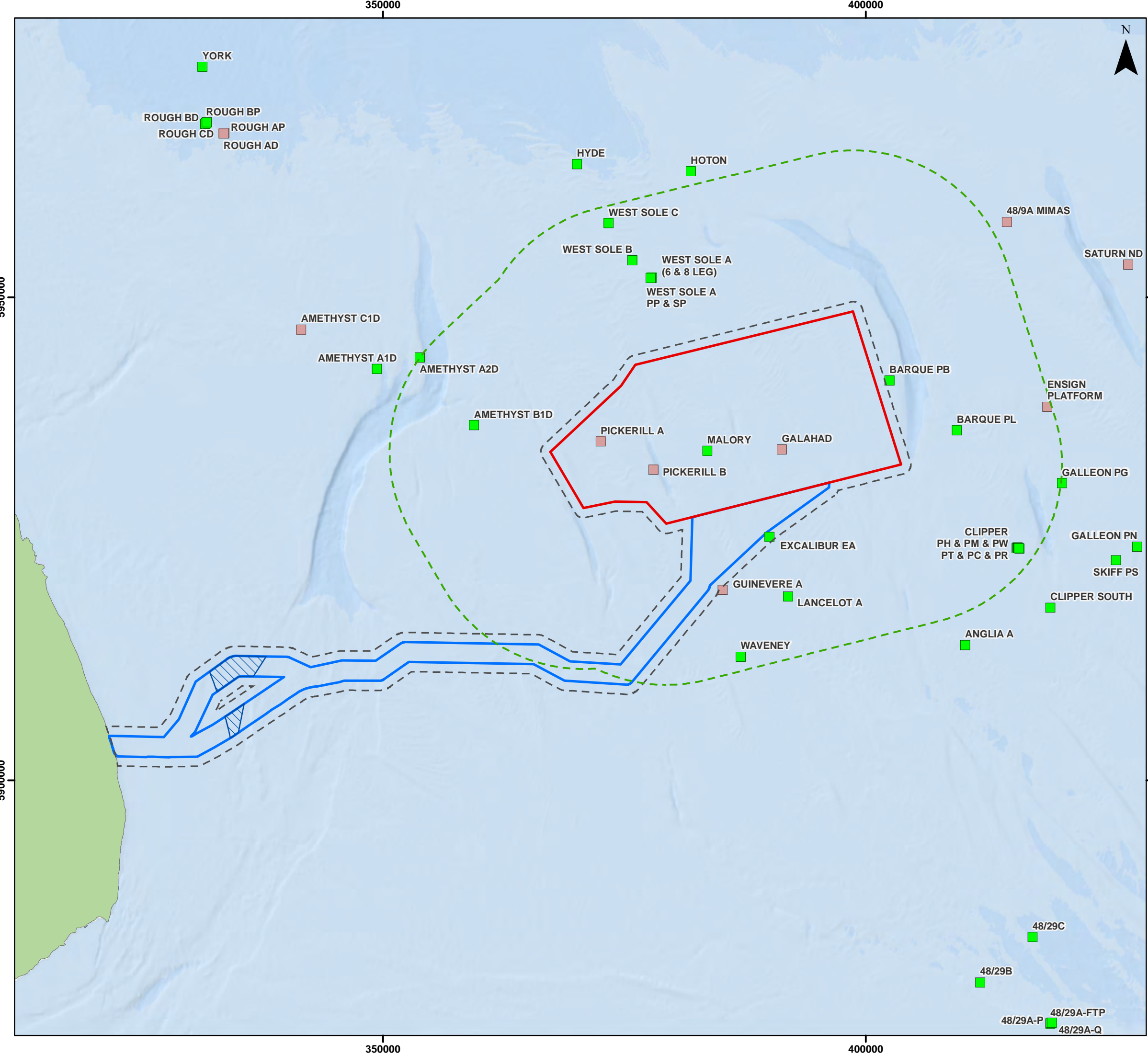
- 18.4.15 Seismic survey operations may be carried out by the oil and gas industry in order to identify sub-surface geological structure that might hold reserves of oil and gas. This involves releasing pulses of acoustic energy along designated survey lines with the energy penetrating the sub-surface and reflecting back to the surface where it is detected by acoustic transducers and relayed to a recording vessel.
- 18.4.16 To date there are no known geophysical surveys planned to occur within the Direct Study Area during the construction phase of the Project. It is recognised that further surveys may be planned during the development of the Project and consultation with relevant licence block holders would need to be ongoing to identify potential seismic survey activity. If such activity will be required in the future it will be adequately planned and analysis in line with regulatory requirements, good engineering practice and the safe operability regime existing on the UKCS.

### Surface Structures








- 18.4.17 Oil and gas related surface structures include permanent infrastructure such as manned and unmanned production platforms, as well as temporary structures such as drilling rigs and vessels. Offshore platforms are protected by a 500m safety zone under Section 22 of the Petroleum Act 1987.

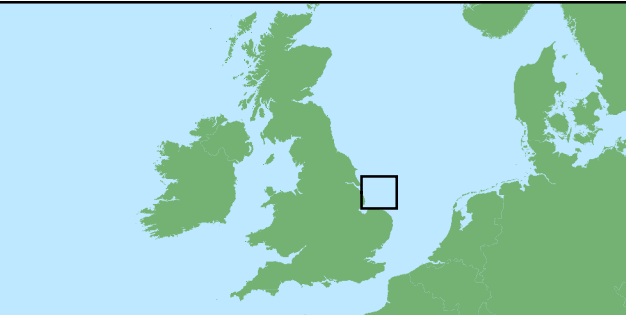


- 18.4.18 The ZOI for all impacts considered on oil and gas surface structures is the Helicopter Access Study Area, as shown in Figure 18.1. Surface structures outside this area, although shown in Figure 18.5 in order to provide regional context, have not been considered further in this assessment. There are a total of 24 permanent structures within the Helicopter Access Study Area, all production platforms, of which three are no longer in use. Four platforms are located within the Direct Study Area, of which two are no longer in use. The location of the platforms is shown in Figure 18.5, with details provided in Table 18.7.
- 18.4.19 Of the four platforms located within the Direct Study Area, as outlined in Table 18.7, only one is active, and none are manned. Pickerill A and B are not in use, with operations halted in 2018. Perenco received approval for decommissioning works in 2019, including the full removal of topside structures and jackets, which are scheduled for completion by the end of 2023 (Perenco, 2019). Consultation with Perenco has indicated that the Galahad platform is currently hydrocarbon-free, with decommissioning of the topside structures (at least) expected to have been completed prior to the construction of the Project.
- 18.4.20 A microwave link is a communications system that uses a beam of radio wave in the microwave frequency range to transmit information between two fixed locations. Microwave links operate on a Line of Sight (LOS) basis. The following microwave fixed links have been confirmed to exist:
- West Sole A to Malory;
  - West Sole A to Lancelot;
  - West Sole A to Excalibur; and
  - Malory to Excalibur.
- 18.4.21 The impacts on these links are considered within Section 18.7.



**Legend**

-  Array Area
  -  Offshore Export Cable Corridor
  -  ORCP Search Area
  -  Direct Study Area
  -  Helicopter Access Study Area
- Platforms (Status)**
-  Active
  -  Abandoned / Not In Use / Removed



Coordinate System: WGS 1984 UTM Zone 31N

0 10 20 km

Scale: 1:375,000

Preliminary Environmental Information Report

Oil and Gas Platforms

Figure 18.5



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Table 18.7: Oil and Gas platforms within the IOMU Study Areas

Platform Name	Operator	Status	Distance from Project PEIR Boundary (km)
Within the Direct Study Area			
Malory	Perenco	Active	0.0
Galahad		Inactive	0.0
Pickerill A	Perenco	Inactive – Precommission	0.0
Pickerill B			0.0
Within the Helicopter Access Study Area			
Barque PB	Shell UK	Active	1.4
Excalibur EA	Perenco		3.9
Excalibur EA	Perenco		3.9
Barque PL	Shell UK		6.6
Guinevere A	Perenco	Inactive – Removed	8.1
West Sole A (6 leg)	Perenco	Active	8.4
West Sole A (8 leg)			8.4
West Sole A PP			8.4
West Sole A SP			8.4
Amethyst B1D	Perenco	Not in use	8.4
Lancelot A	Perenco	Active	10.4
West Sole B	Perenco		10.6
Clipper PH	Shell UK		14.8
Clipper PW			14.8
Clipper PT			14.9
Clipper PC			14.9
West Sole C	Perenco		14.9
Clipper PR	Shell UK		15.0
Clipper PM			15.0
Waveney	Perenco		15.2
Ensign Platform	Spirit Energy	Not in use	16.2
Amethyst A2D	Perenco	Active	16.7
Galleon PG	Shell UK	Active	16.8

#### 18.4.22 Subsea structures include:

- Wellheads - When a well is drilled the structure placed on the seabed is called a wellhead. There may be a single wellhead, though often there may be several units grouped together to form a block. Attached to the top of the wellhead are the control units called subsea trees;
- Protective structures - These structures can be fully enclosed structures which provide a suspended subsea wellhead protection from dropped objects and to help deflect towed fishing gear;

- Manifolds - A subsea manifold is a large metal piece of equipment, made up of pipes and valves and designed to transfer oil/gas from wellheads into a pipeline; and
- Trees and valves - Subsea trees are structures attached to the top of subsea wells to control the flow of oil/gas from a well. When attached to a subsea well the combined structures can extend to 7m above the seabed in height.

18.4.23 These subsea structures are usually protected by a 500m exclusion zone as applied for and implemented by the operator. The ZoI for all impacts considered on oil and gas subsea structures is the Direct Study Area, as shown in Figure 18.1. Subsea structures outside this area, although shown in Figure 18.6 in order to provide regional context, have not been considered further in this assessment. There is one subsea structure identified within the Direct Study Area: a protective structure located at the join between the Galahad Tee to Malory pipeline and the Lancelot Tee to Galahad Tee pipeline, as shown on Figure 18.6.

### Pipelines

18.4.24 There are a total of eleven oil and gas associated pipelines located within the Direct Study Area, as shown on Figure 18.6, with details provided in Table 18.8. Pipelines are usually protected by a 500m exclusion zone. Where Project export, inter-array and interlink cables will be required to cross an active pipeline, a commercial crossing agreement will be entered into with the pipeline operator. Similarly, where Project cables are located within 500m of an active pipeline, a commercial proximity agreement will be entered into with the pipeline operator. Further details are provided in Paragraph 18.7.19.

Table 18.8: Pipelines located within the IOMU Direct Study Area

Pipeline	Fluid Type	Status	Operator
Galahad Tee to Malory	Chemical	Not in use	Perenco
Guinevere to Lancelot	Gas	Not in use	Perenco
Lancelot to Excalibur	Chemical	Not in use	Perenco
Galahad Tee to Lancelot Tee	Gas	Active	Perenco
34 Inch Gas Shearwater – Bacton Seal Line	Gas	Active	Shell PLC
Pickerill A to Pickerill B	Chemical	Not in use	Perenco
Viking AR to Theddlethorpe	Gas	Not in use	Harbour Energy PLC
Loggs PP to Theddlethorpe	Gas	Not in use	Harbour Energy PLC
Lancelot to Guinevere	Chemical	Not in use	Perenco
Viking AR to Theddlethorpe MEOH Line	Methanol	Not in use	Harbour Energy PLC
16" Gas Barque PB – Clipper PT	Gas	Active	Shell PLC

### Oil and Gas Operations: Shipping and Navigation

18.4.25 A range of vessels are required to service or support oil and gas operations. This may include:

- Offshore support vessels such as platform supply vessels bringing supplies and equipment and removing waste;

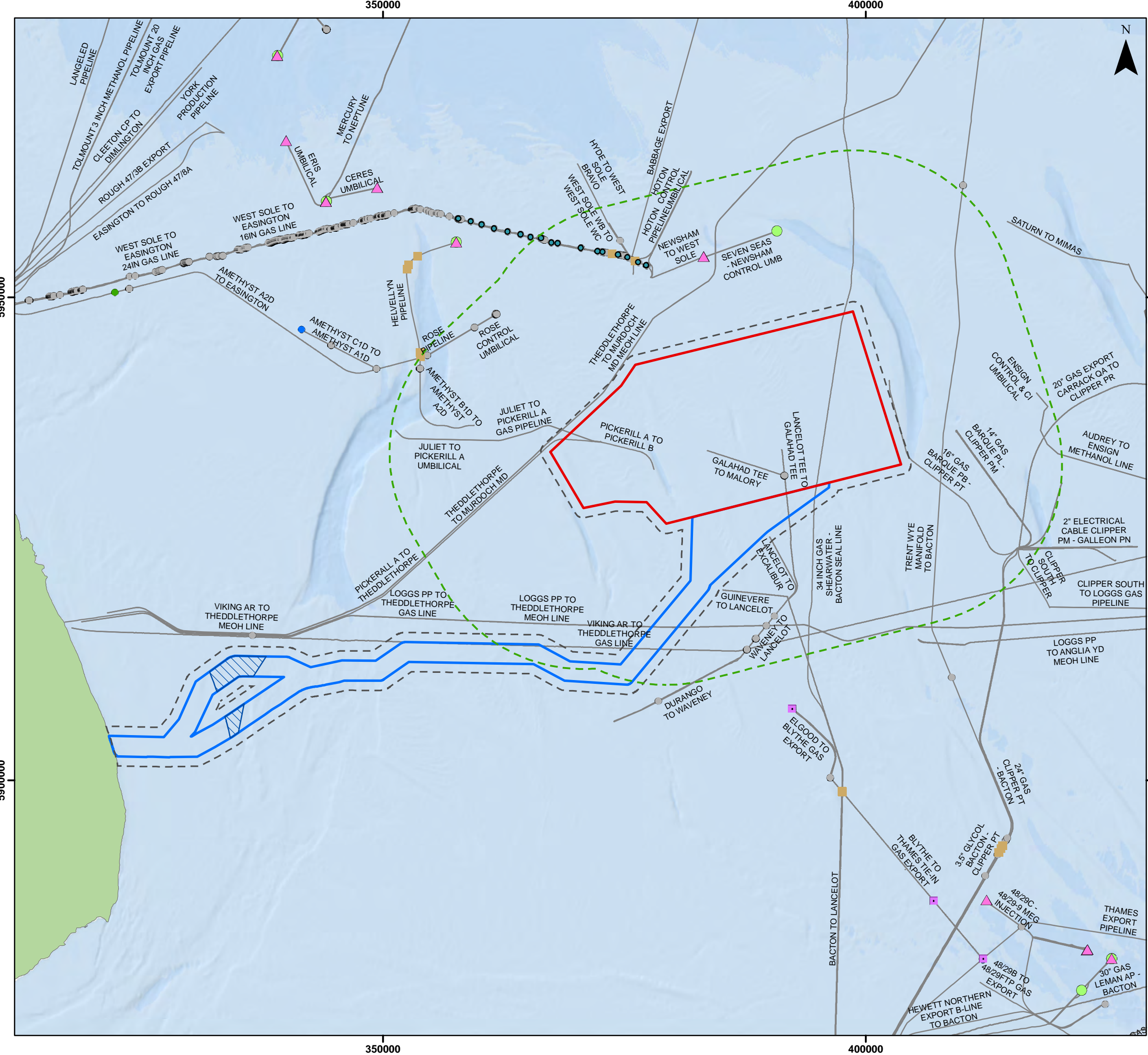


- Larger, specialist vessels such as drilling rigs, crane barges and accommodation facilities which may be stationed adjacent to platforms or over subsea wells/infrastructure in order to drill, re-enter or abandon wells, undertake construction or decommissioning activity and provide accommodation for personnel undertaking significant construction, maintenance or decommissioning campaigns; and
- Supporting vessels such as tugs and anchor handlers, emergency response and recovery vessel, survey vessels, etc.

18.4.26 Vessel visits may be planned, in order to change crews or carry out pre-planned work, or unplanned, in order to respond to a problem or emergency. Vessels do not have specified routes and do not always originate directly from shore, with some routes transiting via other platforms first. The most commonly used vessel routes (as defined by AIS data) including use by oil and gas vessels are described in Volume 1, Chapter 15: Shipping and Navigation.

#### Oil and Gas Operations: Helicopter Access

18.4.27 Most platforms (as described in Paragraph 18.4.17), both manned and unmanned, will be at least partly accessed using helicopters, particularly for crew transfers. The safety of helicopters approaching platforms is governed by operating procedures which can be affected by the presence of wind turbines. Project infrastructure therefore has the potential to affect helicopter operations at a number of platforms within the Helicopter Access Study Area, particularly the Malory platform located within the Project array area. In addition, the Project have been made aware that temporary helicopter access may be required to key subsea infrastructure points, for example the Galahad Tee pipeline point, where a jack-up vessel with helipad may be in place when undertaking maintenance (personal communication, Perenco). Full details are provided in Volume 2, Appendix 18.1: Helicopter Access Report.



### Legend

- Array Area
- Offshore Export Cable Corridor
- ORCP Search Area
- Direct Study Area
- Helicopter Access Study Area
- Subsea Pipeline

#### Oil and Gas Active Subsea Infrastructure

- Anode Assembly
- Manifold
- Mattress
- Obstruction
- Protection
- Rock Dump
- Wellhead
- Other Subsea

Coordinate System: WGS 1984 UTM Zone 31N

0 10 20 km

Scale: 1:375,000

Preliminary Environmental Information Report

Oil and Gas Subsea Infrastructure and Pipelines

Figure 18.6

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## Hydrogen and Gas Storage

18.4.28 There are currently no hydrogen and gas storage sites licensed in England, however, this is an evolving sector and Neptune Energy have proposed Project DelpHYnus, with 1.8 GW of blue hydrogen production, in combination with CCUS located at the Theddlethorpe gas terminal site. This site is located outside of the Direct Study Area and therefore has not been considered further. Further developments may be proposed in the future, and further information will be provided within the ES if available.

## Carbon Capture Usage and Storage (CCUS)

18.4.29 CCUS is likely to have a major role in reducing UK carbon dioxide (CO<sub>2</sub>) emissions in the future, utilising, for example, depleted subsea oil and gas reservoirs to provide long term storage of CO<sub>2</sub>. There are currently six existing CO<sub>2</sub> appraisal and storage licenses on the UK Continental Shelf. The closest CCUS lease area is the Endurance project, a proposed underground saline aquifer storage reservoir located approximately 43km from the PEIR Boundary. Infrastructure will be required to connect the project to the Humber region, although this will not be located close to any Project infrastructure, and therefore this site has not been considered further.

18.4.30 The North Sea Transition Authority (NSTA) launched the UK's first carbon storage licencing round in June 2022, with 13 areas available for bids. The areas are located within the East Irish Sea, Northern North Sea, Central North Sea, and Southern North Sea. Awards are expected in 2023, with sites potentially becoming operational between 2027 – 2029 (NSTA, 2022).

18.4.31 Several CCUS areas are available for bids within the vicinity of the Project, including within the Direct Study Area. The Project array area has a minor (0.49km<sup>2</sup>) overlap with Southern North Sea (SNS) Area 6, as shown on Figure 18.7, with the Project ECC overlapping with SNS Area 3. However, as bid awards have not yet been made these cannot currently be assessed due to lack of data confidence. Impacts on CCUS have therefore been scoped out of assessment and are not considered further, although this may be reassessed in the future as further information becomes available.

## Nuclear Facilities

18.4.32 EDF's Sizewell nuclear facilities (Sizewell A, B and C) are located on the Suffolk coast approximately 143km to the south of the Project array area at the closest point. This distance is outside both study areas, as outlined in Paragraph 18.4.1 and shown on Figure 18.1. Therefore, as agreed within the Scoping Opinion as outlined in Table 18.2, impacts on nuclear facilities have been scoped out of assessment and are not considered further.



## Subsea Cables

- 18.4.33 'Subsea cables' is a broad term for a range of cables that are beneath the sea surface, these cables are typically (but not exclusively) subsea telecoms, power cables and interlink cables. The ZOI for all impacts considered on subsea cables is the Direct Study Area, as shown in Figure 18.1. Subsea cables outside this area, although shown in Figure 18.5 in order to provide regional context, have not been considered further in this assessment. There are no subsea cables within the Direct Study Area with the exception of OWF export cables, which are dealt with separately as part of OWF receptors (as outlined in Paragraph 18.4.7). The Viking Link Interconnector, although it passes within several kilometres of the Project ECC as indicated on Figure 18.6, is of sufficient distance away that no pathway to significant effect has been identified. Impacts on subsea cables have therefore been scoped out of assessment and are not considered further.
- 18.4.34 In addition, the Offshore Transmission Network Review (OTNR) process has identified a number of possible future cables that may be developed and pass through the study area to make landfall on the Lincolnshire coast. In addition, National Grid are proposing two 'bootstrap' subsea transmission cables from Scotland which are also expected to make landfall in Lincolnshire. The status and details of these additional subsea cable developments will be considered in the EIA process as details become available.

## Wastewater Assets

- 18.4.35 The Ingoldmells Sewage Treatment Works and associated outfalls are located to the south of the landfall zone however outside the Direct Study Area. There are no other wastewater assets identified in the vicinity of the Project infrastructure. Impacts on wastewater assets have therefore been scoped out of assessment and are not considered further.

## Marine Disposal

- 18.4.36 Since the end of 1998, most forms of disposal at sea have been prohibited. The main exceptions are the disposal of dredged material originating from ports and harbours for the purposes of maintaining navigable shipping channels and the disposal of material originating from the installation of offshore infrastructure (for instance material from sandwave clearance, seabed preparation and drill arisings).
- 18.4.37 The largest ZOI for all impacts considered on marine disposal areas is the Direct Study Area, as shown in Figure 18.1. Disposal areas outside this area, although shown in Figure 18.5 in order to provide regional context, have not been considered further in this assessment. There are two disposal sites within the Direct Study Area, as presented within Figure 18.3 and Table 18.9, of which one is closed (Sheringham Shoal Drillings (HU123)). The only open disposal area in the Direct Study Area is the Race Bank OWF (HU126), used for the construction of the Race Bank OWF. As this windfarm is currently operational, this site is assumed to be no longer in use, and therefore disposal operations to this area will not be impacted by Project activities. Marine disposal areas have therefore been scoped out of further assessment.



Table 18.9: Marine disposal sites located within the vicinity of the study area

Code	Disposal Site	Distance to array area (km)	Distance to offshore ECC (km)
HU123	Sheringham Shoal Drillings	37.4	0.0
HU126	Race Bank OWF	22.8	0.0

### Aggregates Sites

18.4.38 The marine aggregate industry is licensed commercially by TCE; however, production agreements are only issued once the operator has obtained a Marine Licence under the Marine and Coastal Access Act (MCAA) (2009). A licence allows extraction to take place for a set time period (no more than 15 years) and is accompanied by operating conditions such as maximum extraction volumes, as well as environmental measures and monitoring requirements.

18.4.39 The largest Zol for all impacts considered on marine aggregate areas is the Direct Study Area, as shown in Figure 18.1. Aggregate areas outside this area, although shown in Figure 18.5 in order to provide regional context, have not been considered further in this assessment. There is one active marine aggregate extraction site in the Direct Study Area, as well as an Exploration and Option Area (Figure 18.7), both of which overlap with the Project ECC. Details of these areas are provided in Table 18.10 below. Consultation with Boskalis/Westminster Gravels Ltd has indicated that any impact on marine dredging activity is likely to be minimal given the local dredging areas do not intersect the array area.

Table 18.10: Marine aggregate sites within the Project study areas

Licence Area	Operator	Area Name	Status	Licence End Date
515/2	Westminster Gravels Ltd	Outer Dowsing	Operation	12/31/2029
1805	Hanson Aggregates Marine Ltd	Inner Dowsing	Exploration and Option Area	09/01/2019

18.4.40 These sites listed above are a subset of the wider Humber Region aggregates area within which the Project is located. During 2020, 3.52 million tonnes of construction aggregate were dredged within the Humber Region, from a permitted licensed tonnage of 6.88 million. In addition, 0.67 million tonnes were dredged for beach nourishment, which takes place annually along the Lincolnshire coast under the 'Lincshore' management scheme, operated by the Environment Agency (Environment Agency, 2019; TCE and BMAPA, 2021). Overall, in 2020, 90% of regional dredging effort took place within 14.33km<sup>2</sup>.

## Future Baseline

- 18.4.41 Proposed infrastructure has been outlined within the current baseline in the relevant receptor section where there is a high level of certainty or information available, including where infrastructure is already under construction or where a planning application has been approved or is awaiting decision. This is to ensure that all potential receptors, including those that are not yet in construction, are included in the assessment where a reasonably high level of certainty is available. This in line with the Inspectorate Advice Note 17 (the Inspectorate, 2019).
- 18.4.42 Proposed infrastructure or licensed activities with lower levels of certainty or information available, for example developments where a Scoping Report has been submitted or no planning application has been submitted, have not been outlined within the current baseline. Infrastructure and activities of this type includes:
- Aggregate Area 1805 (Inner Dowsing), operated by Hanson Aggregates Marine Ltd, is currently an Exploration and Option Area, although an application for a Production Area is anticipated shortly; and
  - Aggregate Tender Area 2103 (shown on Figure 18.7) is part of the 2021/2022 marine aggregates tender round, with potential to be awarded an Exploration and Option Agreement subject to the results of a plan-level HRA.
- 18.4.43 Due to the lack of available information, the effects of these developments are not able to be fully determined. Developments will be assessed based on existing information as well as the identification of a worst-case scenario, as presented in Table 18.11. The collation of baseline information and use across the study area is ongoing and proposed developments may be incorporated into future assessments as more information becomes available.
- 18.4.44 Proposed infrastructure within these areas has been outlined within the relevant receptor section of the current baseline above. The future baseline scenario for IOMU is subject to gradual change as new projects are proposed and developed, for example as CCUS licences are awarded. The future baseline scenario for oil and gas activities and associated development (including platforms, wells and pipelines) is considered to be subject to a large degree of change, which will depend on currently unknown factors including political priorities for energy security and net zero. Most oil and gas platforms in the area are being decommissioned, although further exploration and extraction may take place in the future. Further information will be integrated into the assessment as it becomes available.

## 18.5 Basis of Assessment

### Scope of the Assessment

- 18.5.1 A Scoping Report and request for a Scoping Opinion was submitted to the Secretary of State (SoS) (administered by the Planning Inspectorate (the Inspectorate)) in 2022. The phrasing of impacts scoped in for assessment have been modified since the submission of the Scoping Report in order to provide a clearer assessment. However, care has been taken that all impacts and receptors proposed to be scoped in within the Scoping Report (and subsequent Scoping Opinion) have been captured within the potential impacts outlined below.



### Impacts Scoped in for Assessment

18.5.2 The following impacts have been scoped into this assessment:

- Construction:
  - Impact 1: Activity or access displacement associated with increased vessel movements and the use of safety zones during Project construction activities;
  - Impact 2: Direct disturbance and damage to existing assets and infrastructure from Project construction activities;
- Operations and Maintenance (O&M):
  - Impact 3: Activity or access displacement associated with increased vessel movements and the use of safety zones during Project operational and maintenance activities;
  - Impact 4: Direct disturbance and damage to existing assets and infrastructure from Project operational and maintenance activities;
  - Impact 5: Disturbance to operations from the physical presence of Project infrastructure;
  - Impact 6: Interference to helicopter access to oil and gas infrastructure;
- Decommissioning:
  - Impact 7: Activity or access displacement associated with increased vessel movements and the use of safety zones during Project decommissioning activities;
  - Impact 8: Direct disturbance and damage to existing assets and infrastructure from Project decommissioning activities;
- Cumulative:
  - Impact 9: Cumulative activity or access displacement associated with increased vessel movements and the use of safety zones;
  - Impact 10: Cumulative interference to helicopter access to oil and gas infrastructure.

### Impacts Scoped Out of Assessment

18.5.3 Based on the baseline environment information currently available, the project description (outlined in Volume 1, Chapter 3: Project Description) and the advice within the Scoping Opinion (the Inspectorate, 2022) a number of impacts have been scoped out of assessment for IOMU and as such are not considered further in the EIA process. These impacts are outlined below:

- Impacts on wave and tidal energy sites;
- Impacts on oil and gas assets subject to decommissioning;
- Impacts on subsea cables;



- Impacts on marine disposal areas;
- Impacts on wastewater assets;
- Impacts on CCUS; and
- Impacts on nuclear facilities.

### Realistic Worst Case Scenario

18.5.4 The following section identifies the Maximum Design Scenario (MDS) in environmental terms, defined by the project design envelope.

Table 18.11: Maximum Design Scenario for IOMU for the Project alone

Potential effect	Maximum design scenario assessed	Justification
<b>Construction</b>		
Impact 1: Activity or access displacement associated with increased vessel movements and the use of safety zones during Project construction activities.	<p><b>WTG installation</b></p> <ul style="list-style-type: none"> <li>30 vessels (1,563 return trips)</li> </ul> <p><b>WTG Foundation Installation</b></p> <ul style="list-style-type: none"> <li>29 vessels (834 return trips)</li> </ul> <p><b>OP Installation</b></p> <ul style="list-style-type: none"> <li>18 vessels (168 return trips)</li> </ul> <p><b>OP Foundation Installation</b></p> <ul style="list-style-type: none"> <li>18 vessels (96 return trips)</li> </ul> <p><b>Offshore Export Cable Installation</b></p> <ul style="list-style-type: none"> <li>25 vessels (1,122 return trips)</li> </ul> <p><b>Inter-array and Offshore Interlink Cable Installation)</b></p> <ul style="list-style-type: none"> <li>19 vessels (1,060 return trips)</li> </ul> <p><b>Total</b></p> <ul style="list-style-type: none"> <li>131 vessels (4,471 return trips)</li> </ul> <p><b>Maximum extent of proposed works:</b></p> <ul style="list-style-type: none"> <li>Buoyed construction area deployed around the maximum extent of the array area;</li> <li>Implementation of 500m radius construction safety zones;</li> <li>Maximum inter-array cable length of 351km;</li> <li>Maximum interlink cable length of 123.75km;</li> <li>Maximum offshore export cable length of 514.85km; and</li> <li>Four year construction period.</li> </ul>	<p>The maximum design scenario for vessel traffic is associated with the peak numbers of vessels during the construction phase and the number of round trips between port and site.</p> <p>The maximum design scenario for activity or access displacement is associated with the use of temporary 500m safety zones around construction works throughout the maximum duration of the proposed works.</p> <p>These scenarios are most likely to give rise to potential interactions with IOMU assets.</p>
Impact 2: Direct disturbance and damage to existing assets	<p><b>Maximum extent of proposed works:</b></p> <ul style="list-style-type: none"> <li>93 WTGs, 7 offshore platforms, 4 export cables;</li> </ul>	The maximum design scenario for direct disturbance and

Potential effect	Maximum design scenario assessed	Justification
and infrastructure from Project construction activities.	<ul style="list-style-type: none"> <li>▪ Buoyed construction area deployed around the maximum extent of the array area;</li> <li>▪ Implementation of 500m radius construction safety zones;</li> <li>▪ Maximum inter-array cable length of 351km;</li> <li>▪ Maximum interlink cable length of 123.75km.</li> <li>▪ Maximum offshore export cable length of 514.8km; and</li> <li>▪ Four year construction period.</li> </ul> <p><b>Safety zones</b></p> <ul style="list-style-type: none"> <li>▪ 500m around infrastructure under construction;</li> <li>▪ 50m around incomplete structures and temporarily paused construction activities; and</li> <li>▪ 50m around the Project where the construction is complete but Project not yet commissioned</li> </ul>	<p>damage to existing assets is associated with the greatest reduction in available sea room. This scenario is most likely to give rise to potential interactions with IOMU assets.</p>
<b>Operations and Maintenance</b>		
Impact 3: Activity or access displacement associated with increased vessel movements and the use of safety zones during Project operational and maintenance activities.	<p>Maximum design scenario is identical (or less) to that of construction phase over the 35 year operational life of the Project.</p> <p><b>Maximum number of vessel types in the windfarm at any one time:</b></p> <ul style="list-style-type: none"> <li>▪ Crew Transfer Vessels (CTVs) - 10</li> <li>▪ Service Operations Vessels (SOVs) - 2</li> <li>▪ Supply vessels - 12</li> <li>▪ Jack Up Vessels (JUVs) - 4</li> </ul> <p><b>Total number of vessels within the windfarm at one time</b></p> <ul style="list-style-type: none"> <li>▪ 28</li> </ul>	<p>Operation and maintenance vessels will require fewer vessels and fewer return trips than the construction phase.</p> <p>Temporary 500m safety zones may be required for infrastructure that is undergoing major maintenance (for example WTG blade replacement).</p>

Potential effect	Maximum design scenario assessed	Justification
Impact 4: Direct disturbance and damage to existing assets and infrastructure from Project operational and maintenance activities.	Maximum design scenario is identical (or less) to that of construction phase, see Impact 2.	The maximum design scenario for direct disturbance and damage to existing assets is associated with the greatest reduction in available sea room. This scenario is most likely to give rise to potential interactions with IOMU assets.
Impact 5: Disturbance to operations from the physical presence of Project infrastructure.	<b>Array area:</b> <ul style="list-style-type: none"> <li>500km<sup>2</sup></li> </ul> <b>Maximum infrastructure installed:</b> <ul style="list-style-type: none"> <li>93 WTGs, 7 offshore platforms, 4 export cables;</li> <li>Maximum inter-array cable length of 351km;</li> <li>Maximum interlink cable length of 123.75km; and</li> <li>Maximum offshore export cable length of 514.8km.</li> </ul>	The maximum potential physical presence of infrastructure will be from the installation of the maximum number of WTGs and offshore platforms.
Impact 6: Interference to helicopter access to oil and gas infrastructure	<b>See Impact 5</b>	The maximum number of wind turbines and other structures within the array area affecting the operation of helicopters approaching or departing from oil and gas platforms.
<b>Decommissioning</b>		
Impact 7: Activity or access displacement associated with increased vessel movements and the use of safety zones during Project decommissioning activities.	Maximum design scenario is identical (or less) to that of construction phase, see Impact 1.	<p>This will result in the maximum potential vessel disturbance.</p> <p>The maximum design scenario for activity or access displacement is associated with the use of temporary 500 m</p>

Potential effect	Maximum design scenario assessed	Justification
		safety zones around decommissioning works throughout the maximum extent of the proposed works, with the duration of decommissioning being no greater than construction.
Impact 8: Direct disturbance and damage to existing assets and infrastructure from Project decommissioning activities.	Maximum design scenario is identical (or less) to that of construction phase, see Impact 2.	The maximum design scenario for direct disturbance and damage to existing assets is associated with the greatest reduction in available sea room. This scenario is most likely to give rise to potential interactions with IOMU assets.

## Embedded Mitigation

18.5.6 Mitigation measures that were identified and adopted as part of the evolution of the project design (embedded into the project design) and that are relevant to IOMU are listed in Table 18.8. General mitigation measures, which would apply to all parts of the project, are set out first. Thereafter mitigation measures that would apply specifically to IOMU issues associated with the construction, O&M, and decommissioning of the Project are described separately.

Table 18.12: Embedded mitigation relating to IOMU

Project phase	Mitigation measures embedded into the project design
<b>General</b>	
Project design	Where possible, avoidance of interaction with existing or proposed infrastructure and other marine user receptors through project design and specifically siting of the Project infrastructure and design of the offshore ECC route.
Lighting and marking	Marking and lighting of the site in agreement with Trinity House and in line with IALA R139/G1162 (IALA, 2021).
Marine coordination for project vessels	Development of, and adherence to, a Vessel Management Plan (VMP) (including defined vessel navigational routes, a vessel code of conduct to reduce collision risk and minimize disturbance and identification and avoidance of sensitive areas where practicable).
Cable Specification and Installation Plan (CSIP)	Where possible, subsea cable burial will be the preferred option for cable protection. Cable burial will be informed by the cable burial risk assessment (CBRA) – which will take account of the presence of designated sites - and detailed within the Cable Specification and Installation Plan (CSIP). An outline CSIP will be prepared in support of the Application, which will be finalised post-consent.
Cable burial	Subsea cables will be installed to a minimum target burial depth of 1m.
Promulgation of information	Circulation of relevant project information including via all usual means (e.g., Kingfisher Bulletin, Notice/Notifications to Mariners).
<b>Construction</b>	
Project design	Where potential interaction between the Project and other infrastructure or marine users are identified, owners and operators will be consulted, and standard legal agreements, for example crossing or proximity agreements, will be put in place.
Project design	Trenchless techniques, such as Horizontal Directional Drill (HDD) techniques will be used at the landfall location.
Application for Safety Zones	Application for safety zones around structures during construction: <ul style="list-style-type: none"> <li>500m around structures where construction is ongoing; and</li> <li>50m around all structures prior to commissioning of the Project.</li> </ul>
<b>Operation and Maintenance</b>	
Application for Safety Zones	Application for safety zones around structures during periods of major maintenance: <ul style="list-style-type: none"> <li>500m around structures where major maintenance is ongoing.</li> </ul>

Project phase	Mitigation measures embedded into the project design
<b>Decommissioning</b>	
Decommissioning Programme	Development of, and adherence to, a Decommissioning Programme.
Application for Safety Zones	Application for safety zones around structures during decommissioning: <ul style="list-style-type: none"> <li>500m around structures where decommissioning is ongoing.</li> </ul>

## 18.6 Assessment Methodology

- 18.6.1 The approach to EIA will follow the general approach outlined in Volume 1, Chapter 5: EIA Methodology of the PEIR in addition to the guidance outlined in Section 18.2.
- 18.6.2 The assessment of potential impacts on IOMU is based on the MDS as identified from the design envelope (often referred to as the 'Rochdale Envelope') (see Volume 1, Chapter 3: Project Description). The key maximum assessment assumptions comprise the layout of the windfarm, the number and size of offshore structure, the type and size of foundations used, as well as the timing and duration of the proposed offshore works (see Table 18.11).
- 18.6.3 The assessment of impacts and effects on IOMU is supported by baseline data collection to ensure identification of relevant details on the IOMU receptors within the study area. The current baseline conditions presented in Section 18.4 sets out currently available information from the study areas. The collation of baseline information and use across the study area is ongoing and will be supported by the consultation provided for following publication of this PEIR, together with meetings with relevant stakeholders (as required) in order to ensure appropriate detail is obtained to inform the assessment of potential impacts.
- 18.6.4 Consultation with operators (as required) was also undertaken to establish the current status of known and planned infrastructure and other users within the study areas. Existing and planned licensable activities have been identified and a timeline for future activities associated with the existing or planned infrastructure has been established. Proposed developments which have limited levels of information or certainty available are outlined in the future baseline conditions, although the effects on these developments are not able to be fully determined and therefore have not been assessed.
- 18.6.5 A helicopter access study to oil and gas assets (Volume 2, Appendix 18.1: Helicopter Access Report) has been undertaken to inform the PEIR. A further study assessing marine access and allision risks to oil and gas assets will be undertaken for the ES.
- 18.6.6 The approach to determining the significance of the effect is a two-stage process that involves defining sensitivity of the receptors and the magnitude of the impacts against set criteria. This section describes the criteria applied in this chapter to assign values of sensitivity to the receptors and determine the magnitude of potential impacts. Further details are provided in Volume 1, Chapter 5: EIA Methodology. The criteria for defining magnitude of impact is provided in Table 18.13. The magnitude of potential impacts is defined by a series of factors including the spatial extent of any potential interaction, the likelihood, duration, frequency and reversibility of a potential impact.

Table 18.13: Impact magnitude definitions

Magnitude	Description/reason
High	Total loss of ability to carry on activities. Impact is of extended temporal or physical extent and of long term duration (i.e. total life of the Project) and/or frequency of repetition is continuous and/or effect is not reversible.
Medium	Loss or alteration to significant portions of key components of current activity leading to a reduction in the level of activity that may be undertaken. Physical extent of impact is moderate and/or of medium term duration (i.e. operational period) and/or frequency of repetition is medium to continuous and/or effect is not reversible for the project phase.
Low	Minor shift away from baseline, leading to a reduction in level of activity that may be undertaken. Physical extent of impact is low and/or of short to medium term duration (i.e. construction period) and/or frequency of repetition is low to continuous and/or effect is not reversible for the project phase.
Negligible	Very slight change from baseline condition. Physical extent of impact is negligible and/or of short-term duration (i.e. less than two years) and/or frequency of repetition is negligible to continuous and/or effect is reversible.

18.6.7 The criteria for defining the sensitivity/importance of the receptors are provided in Table 18.14. The sensitivities (or importance) of IOMU receptors are defined by both their potential vulnerability to an impact from the proposed development, their recoverability, and the value or importance of the receptor. Where a receptor could reasonably be assigned more than one level of sensitivity, professional judgement has been used to determine which level is applicable.

Table 18.14: Sensitivity/ importance of the environment

Receptor sensitivity/ importance	Definition
High	Receptor is of high value or importance, with critical importance to the local, regional or national economy. Receptor is highly vulnerable to impacts that may arise from the Project and recoverability is long term or not possible.
Medium	Receptor is of medium value or importance, with reasonable contribution to the value of the local, regional or national economy. Receptor is moderately vulnerable to impacts that may arise from the Project and has moderate to high levels of recoverability.
Low	Receptor is of minor value or importance with small levels of contribution to the value of the local, regional or national economy. Receptor is not generally vulnerable to impacts that may arise from the Project and/or has high recoverability.
Negligible	Receptor is of very low value or importance, with negligible contribution to the value of the local, regional or national economy. Receptor is not vulnerable to impacts that may arise from the Project and/or has high recoverability.



- 18.6.8 The significance of the effect on IOMU receptors will be determined by correlating the sensitivity of the receptor and the magnitude of the impact. The method employed for this preliminary assessment is presented in Table 18.15, where the final assessment for each effect based upon expert judgement. For the purpose of this PEIR, any effects with a significance level of minor or less are considered as not significant in terms of the Environmental Impact Assessment Infrastructure Planning Regulations 2017 (the EIA Regulations).

Table 18.15: Matrix to determine effect significance

		Magnitude of impact			
		<i>Negligible</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>
Sensitivity of receptor	<i>Negligible</i>	Negligible (Not significant)	Negligible (Not significant)	Minor (Not significant)	Minor (Not significant)
	<i>Low</i>	Negligible (Not significant)	Minor (Not significant)	Minor (Not significant)	Moderate (Significant)
	<i>Medium</i>	Minor (Not significant)	Minor (Not significant)	Moderate (Significant)	Major (Significant)
	<i>High</i>	Minor (Not significant)	Moderate (Significant)	Major (Significant)	Major (Significant)

## Assumptions and Limitations

- 18.6.9 The assessments of impacts on IOMU receptors are considered from a safety perspective only and the associated conclusions reflect whether the presence of the Project has any implications for the safety of each stakeholder's assets and associated activities in line with the assessments. Issues of a commercial nature are therefore not considered in this impact assessment.
- 18.6.10 As outlined in Paragraph 18.4.44, licensed activity has been proposed or is being planned within the Direct Study Area, including Aggregate Tender Area 2103. Due to uncertainty associated with the timing, possible extent, and license outcome of these activities, they are unable to be assessed fully as receptors. Therefore, this assessment seeks to identify an MDS based off the information currently available in order to reduce the risk of later design modifications falling outside of the assessment envelope. The worst-case scenario is assessed according to the specific impact, details of which are outlined in the relevant assessment section.

## 18.7 Impact Assessment

### Construction

#### Impact 1: Activity or Access Displacement Associated with Increased Vessel Movements and the Use of Safety Zones During Project Construction Activities

- 18.7.1 The construction of the Project will increase vessel movements within the area by a maximum 119 vessels (3,063 return trips) (as per identified in Table 18.7) over the four year construction period from seabed preparation works (for example sandwave clearing and boulder clearance, should they be required) and the installation of infrastructure (WTGs, offshore platforms, and cables). As described in Volume 1, Chapter 3: Project Description, the construction of the Project will include a maximum of 93 WTGs, associated inter-array and interlink cables with a maximum length of 474.75km, a maximum of seven offshore platforms and a maximum of four export cable circuits with a total length of 514.8km.
- 18.7.2 During the construction of each part of the windfarm infrastructure listed above, there will be 500m safety zones (statutory for WTGs and platforms, and advisory for cable installation) in order to maintain safety of other marine users and the construction site, as outlined in Table 18.12. Guard vessels will also be used where appropriate to ensure that adherence to these safety zones is kept in order to minimize risks to surface navigation. Both increased vessel movements and the associated safety zones may result in activity or access displacement to IOMU receptors in the vicinity of the Project.
- 18.7.3 The study area for this potential impact is the Direct Study Area (see Paragraph 18.4.1 and Figure 18.1), associated with increased vessel movements and the use of 500m safety zones. The worst-case scenario for these impacts assumes that future developments within the study area such as DEP and Aggregate Area 1805 will be operational (in the case of aggregate areas) and in construction (in the case of OWFs) during the construction of the Project. Infrastructure and assets that may be affected include:
- OWFs: Triton Knoll, Race Bank, Lincs, and DEP (assessed as in construction as a worst-case scenario) (see Figure 18.2)
  - Oil and gas activity:
    - Offshore platforms: Malory, Galahad, Pickerill A and Pickerill B (see Table 18.7 and Figure 18.5);
    - Subsea structures: Galahad Tee protective structure (see Paragraph 18.4.23 and Figure 18.6);
    - Pipelines: all overlapping with the Direct Study Area (as outlined in Table 18.8 and shown in Figure 18.6);
  - Marine aggregate areas: Production Area 515/2 (Outer Dowsing) and Exploration and Option Area 1805 (Inner Dowsing), the latter assessed as a Production Area as a worst-case scenario (see Figure 18.7).

- 18.7.4 The larger Project installation vessels (such as jack-up vessels), transport barges and cable laying vessels are likely to transit directly to the site from their home ports, or from construction ports. The vessels likely to operate out of local UK harbours are likely to be the smaller vessels, such as Crew Transfer Vessels (CTVs).
- 18.7.5 The construction vessels will be required to deploy a number of embedded mitigation measures that are listed in Table 18.12. Those that are relevant to vessel movements are:
- The production and promulgation of advanced warning and information including construction vessel routes, locations, dates, and associated safety zones via NtM and Kingfisher Bulletins;
  - The development of a Vessel Management Plan (VMP);
  - Safety zones (500m) around windfarm construction activities and advisory safety zones around cable installation; and
  - Regular updates to the NtM and supplemental VHF broadcast agreed with MCA to ensure all parties are updated on planned works and locations of activities.

#### *Magnitude of Impact*

- 18.7.6 Increased vessel numbers could lead to minor route changes being required for other vessel activities in the area. These could include maintenance vessel activities for OWFs and oil and gas infrastructure, as well as vessels engaged in aggregate dredging and oil and gas operations (such as crew transfers). These impacts will be of localised extent, short-term duration, and are reversible, therefore representing only a very slight change from baseline conditions. In addition, these impacts will be subject to embedded mitigation measures such as NtM and a VMP (as outlined in Table 18.12: Embedded mitigation relating to IOMU Table 18.12) which will ensure any risks of collision or disturbance are appropriately managed. The magnitude of this impact is therefore considered to be negligible.
- 18.7.7 The presence of safety zones (500m) and advisory safety zones may restrict access to other infrastructure within the vicinity of the Project. This could prevent maintenance activities from being carried out, for example on OWFs, offshore oil and gas platforms and subsea structures, and pipelines, as well as construction activities for some assets including the DEP OWF.

- 18.7.8 In terms of OWFs, this would potentially affect the maintenance activities on the already constructed Triton Knoll, Race Bank, and Lincs OWFs. Embedded mitigation measures that will be applied to Project construction vessel activities (outlined in Table 18.12 and Paragraph 18.7.5) will ensure any risks of collision or disturbance are appropriately managed, limiting the potential magnitude of any impact. The greatest potential for impact is expected to arise for DEP, which as a worst-case scenario has been assessed as having an overlapping construction period with the Project. The DEP array area is located immediately adjacent to the Project ECC, and 500m safety zones around these assets may potentially conflict with those of Project vessels. Mitigation will be put in place, including commercial and technical agreements, in addition to existing embedded mitigation measures, in order to prevent any risk of collision and manage potential access displacement. Impacts on existing OWFs in the Direct Study Area are therefore spatially limited, of short-term duration, intermittent, and reversible, and have therefore been considered to be of low magnitude for existing OWFs and of medium magnitude for the DEP OWF.
- 18.7.9 The presence of safety zones also has the potential to inhibit maintenance and decommissioning activities on oil and gas platforms subsea structures, and pipelines. The status of the relevant oil and gas platforms is presented in Table 18.7. The Galahad platform is currently hydrocarbon-free, and therefore will not require maintenance access, unlike Malory. Consultation with Perenco has indicated that decommissioning of the topside structures (at least) is expected to have been completed prior to the construction of the Project. However, details of the decommissioning programme are currently not available and potential impacts on the decommissioning of this asset are unable to be fully assessed. The Pickerill A and B platforms have had topsides removed, with jackets expected to have been removed prior to the construction of the Project. Further information will be provided in the ES if it becomes available.
- 18.7.10 There may be some disruption to local oil and gas operations, and it will therefore be necessary to ensure appropriate cooperation and liaison procedures are in place, in particular with regards to how information will be promulgated between the Applicant and the relevant oil and gas operators at the time. Risks of disturbance and access displacement will be further managed by embedded mitigation measures that will be applied to Project construction vessel activities (outlined in Table 18.12 and Paragraph 18.7.5). Impacts are therefore assessed as short-term, reversible, and avoidable through the use of embedded mitigation measures, and the magnitude of impact is therefore considered to be low.

18.7.11 The presence of safety zones may constrain dredger access to aggregate resources due to the need to respect the safe working separation distance from Project construction works. Areas with the potential to be impacted are Area 515/2 and Area 1805, which as a worst-case scenario has been assessed as a Production Area (as an application is currently anticipated). Both areas overlap with the Project ECC (see Figure 18.7), and therefore the area available to be dredged may be reduced due to the presence of safety zones and Project construction vessels. Embedded mitigation measures that will be applied to Project construction vessel activities (outlined in Table 18.12 and Paragraph 18.7.5) will ensure any potential for access or dredging activity displacement can be appropriately managed to minimise any potential for conflict or constraint on operations. Relevant aggregate operators have been consulted and where appropriate commercial and proximity agreements will be put in place in order to manage potential risks. In addition, refinement of the ECC is being considered in order to further reduce potential impacts. This impact will therefore be of short-term duration, intermittent, and reversible, as well as avoidable through mitigation. It will therefore represent only a very slight change from baseline conditions and is considered to be negligible.

#### *Sensitivity of the Receptor*

18.7.12 Existing windfarms in the area, particularly the Triton Knoll, Race Bank, and Lincs OWFs may be sensitive to potential interruption to operational and maintenance activities, as well as construction activities for the DEP OWF. Delays to maintenance work could cause decreases in production and delays to construction could also be costly to the operator. These assets only overlap with the predicted extent of safety zones (the Direct Study Area) in a relatively small area for the identified OWFs. The Applicant will continue to engage with the operators of these assets in order to manage potential risks. Additionally, impacts will be mitigated through the use of a VMP and advanced warning through NtM (as outlined in Table 18.12 and Paragraph 18.7.5), therefore ensuring potential impacts are appropriately managed. OWF receptors are considered to be of medium value, with reasonable economic contribution to the regional economy, but are not generally vulnerable to potential impacts due to the mitigation outlined above. The sensitivity of the OWF receptors to activity and access displacement is therefore considered to be low.

18.7.13 Impacts may arise from the interruption of maintenance activities on oil and gas receptors including platforms, subsea structures, and pipelines through increased vessel movements and the use of construction safety zones. The potential for disruption will be mitigated through the management of vessel movements via the VMP and advanced warning of construction works through NtM (as outlined in Table 18.12 and Paragraph 18.7.5), therefore ensuring potential impacts are appropriately managed. Oil and gas assets are of high value, with delays to maintenance work causing decreases in production or potential safety risks or environmental impacts such as oil or gas leaks or spills. However, the vulnerability of this receptor is reduced by the embedded mitigation measures identified in Table 18.12 and Paragraph 18.7.5, with the sensitivity of oil and gas receptors to access displacement being assessed as medium.

18.7.14 Impacts are expected to occur in the form of interruptions to the normal routes and navigational passages used by aggregate extraction vessels, due to increased vessel movements and the implementation of safety zones around construction activity. This may lead to exclusion of small areas of aggregate resources. The impact is expected to be greatest at the Area 515/2 and Area 1805 (assessed as a Production Area as a worst-case scenario), both shown on Figure 18.7, due to their overlap with the PEIR Boundary. Consultation is ongoing with the relevant operators to discuss and agree appropriate measures to ensure that no conflicts arise. Consultation with Boskalis/Westminster Gravels Ltd has indicated that any impact on marine dredging activity is likely to be minimal given the local dredging areas do not intersect the array area. Marine aggregate areas are therefore considered to be of medium value, low vulnerability, and high recoverability, and the sensitivity to activity and access displacement is therefore considered to be low.

#### *Significance of Effect*

18.7.15 Based on the assessments of receptor sensitivity and impact magnitude made above, the significance of residual effect on IOMU receptors is considered as follows:

- It is predicted that the sensitivity of OWFs is low, and the magnitude of the impact is low for existing OWFs and medium for the DEP OWF. Therefore, the effect will be of **minor adverse** significance, which is not significant in EIA terms.
- It is predicted that the sensitivity of oil and gas receptors (including surface and subsea structures, and pipelines) is medium, and the magnitude of the impact is low. Therefore, the effect will be of **minor adverse** significance, which is not significant in EIA terms.
- It is predicted that the sensitivity of marine aggregate sites is low, and the magnitude of the impact is negligible. Therefore, the effect will be of **negligible** significance, which is not significant in EIA terms.

#### Impact 2: Direct Disturbance and Damage to Existing Assets and Infrastructure from Construction Activities

18.7.16 As described within Volume 1, Chapter 3: Project Description, it is anticipated that the construction of the Project will include a range of activities including seabed preparation works, cable and foundation installation, and unexploded ordnance UXO clearance. These activities have the potential to directly disturb or damage existing infrastructure within the area.

18.7.17 The worst-case scenario for these impacts assumes that future developments within the study area, such as DEP and Aggregate Area 1805, will be operational (in the case of aggregate areas) and already constructed (in the case of OWFs) during the construction of the Project. Infrastructure and assets that may be affected include:

- OWFs: Triton Knoll, Race Bank, Lincs, and DEP (assessed as constructed as a worst-case scenario) (see Figure 18.1);
- Oil and gas activity:
  - Offshore platforms: Malory and Galahad (see Table 18.7 and Figure 18.5)

- Subsea structures: Galahad Tee protective structure (see Paragraph 18.4.23 and Figure 18.6); and
- Pipelines: all overlapping with the Direct Study Area (as outlined in Table 18.9 and shown in Figure 18.6).

### *Magnitude of Impact*

- 18.7.18 As shown on Figure 18.2, there will be no physical overlap of other OWFs with the Project array area, however the Project ECC may overlap with the Triton Knoll export cable and the Race Bank, Lincs, and DEP array areas (once constructed). Cable installation methods and cable crossings will be designed in accordance with a Cable Specification and Installation Plan (CSIP), which will be conditioned in the Marine Licence, as outlined in Table 18.12. The Applicant will also enter into proximity and crossing agreements with the relevant cable operators. This agreement will determine how crossings are made and how close construction activities can be to the existing infrastructure, as well as containing detailed requirements for each crossing, including mitigation.
- 18.7.19 Crossing agreements will allow cable operators to access their infrastructure during the construction of the Project as far as practicable, although 500m construction safety zones will be required (as identified in Table 18.12 and discussed in Paragraph 18.7.2 *et seq.*). Crossing agreements will ensure close communication and planning between both parties to ensure disruption of activities is minimized, and that risks are reduced to acceptable levels. The final crossing design will be determined post-consent, in agreement with relevant operators. Impacts will be of local spatial extent and avoidable through the implementation of cable crossing agreements with cable operators and adherence to a CSIP. The magnitude of impacts will therefore represent only a slight change from baseline conditions and has therefore been considered to be negligible.
- 18.7.20 Construction activities such as the deployment of jack-up vessels, vessel anchoring, seabed preparation activities and the installation of cables and foundations can potentially damage oil and gas receptors (including surface and subsea infrastructure, and pipelines), especially when carried out in proximity to these assets and at crossings. This may result in damage or potential failure of the assets, potentially resulting in severe environmental consequences in the case of an oil or gas spill or leak. Embedded mitigation measures, as outlined in Table 18.12, will be put in place in order to identify and prevent risks to oil and gas receptors, including commercial and technical agreements.



18.7.21 A pre-construction survey will be carried out which will include geophysical and magnetometer surveys that will be able to identify existing assets, including pipelines, which may be in a different position to their charted location because of past use of outdated locating techniques. Micro-siting will be carried out where practicable and to minimize crossings and maintain a safe distance from existing assets. As outlined in Paragraph 18.7.19 *et seq.*, cable and pipeline crossings will be designed in accordance with a CSIP, and the Applicant will enter into proximity and crossing agreements with relevant oil and gas operators. Direct impacts from construction vessels will be mitigated against by specific cable routing and the implementation of an appropriate buffer between Project infrastructure and oil and gas installations. Appropriate controls will be implemented for UXO clearance should this be required following detailed pre-construction surveys. The impact is predicted to be of local spatial extent, short-term duration, intermittent and avoidable through the implementation of commercial and technical agreements. The magnitude of impact is therefore considered to represent a slight change from baseline conditions and has therefore been assessed as negligible.

#### *Sensitivity of the Receptor*

18.7.22 Construction activities including seabed preparation, vessel anchoring and cable laying have the potential to disturb or damage export cables for existing OWFs within the Direct Study Area. This could lead to efficiency reduction, cable de-burial or potential failure of the assets, which would be expensive to repair and has the potential to cause disruption to power distribution. Other OWFs are therefore deemed to be of medium vulnerability, medium recoverability, and high value. The sensitivity of this receptor is therefore deemed to be medium.

18.7.23 Oil and gas receptors potentially at risk from direct disturbance and damage from construction activities are outlined in Paragraph 18.7.16 and include offshore platforms, subsea infrastructure, and pipelines. Impacts from construction activities could result in damage or potential failure of the assets, potentially resulting in severe environmental consequences in the case of an oil or gas spill or leak. These assets are therefore deemed to be of high vulnerability, medium recoverability, and high value. The sensitivity of this receptor is therefore considered to be high.

#### *Significance of Effect*

18.7.24 Based on the assessments of receptor sensitivity and impact magnitude made above, the significance of residual effect on IOMU receptors is considered as follows:

- It is predicted that the sensitivity of OWFs is medium, and the magnitude of the impact is negligible. Therefore, the effect will be of **minor adverse** significance, which is not significant in EIA terms.
- It is predicted that the sensitivity of oil and gas receptors (including surface and subsea structures, and pipelines) is high, and the magnitude of the impact is negligible. Therefore, the effect will be of **minor adverse** significance, which is not significant in EIA terms.

## Operations and Maintenance

### Impact 3: Activity or Access Displacement Associated with Increased Vessel Movements and the Use of Safety Zones During Operational and Maintenance Activities

- 18.7.25 Increases in vessel movements during the operational phase will be smaller than those for construction and are of lesser magnitude, as outlined in Table 18.11. The physical presence of temporary safety zones (500m) during the operational phase, for example for maintenance purposes, will be less than that for construction.
- 18.7.26 The magnitude of impacts and the sensitivities of IOMU receptors to this impact are described in detail in Paragraph 18.7.1 *et seq.* The study area for this potential impact is the Direct Study Area, as shown in Figure 18.1. Infrastructure and assets that may be affected are outlined in Paragraph 18.7.3.
- 18.7.27 The magnitude of the impacts has been assessed as negligible to low, with the maximum sensitivity of the receptors being medium.
- 18.7.28 Mitigation will also be deployed during the operational phase of the Project and is identified in Table 18.12, which includes advanced warning of maintenance operations and vessel routes and the implementation of a VMP. The significance of effect from activity or access displacement occurring from the operational phase of the Project will therefore be of **minor adverse** significance at worst, which is not significant in EIA terms.

### Impact 4: Direct Disturbance and Damage to Existing Assets and Infrastructure from Operational and Maintenance Activities

- 18.7.29 The potential for direct disturbance and damage to existing assets and infrastructure from operational and maintenance works will be much lower than that of construction, as maintenance activities will be less frequent and therefore provide less potential for interaction with IOMU receptors. The magnitude of the impact and sensitivities of IOMU receptors to this impact are described in detail in Paragraph 18.7.16 *et seq.*
- 18.7.30 The study area for this potential impact is the Direct Study Area, as shown in Figure 18.1. Infrastructure and assets that may be affected are outlined in Paragraph 18.7.17.
- 18.7.31 The magnitude of the impacts has been assessed as negligible, with the maximum sensitivity of the receptors being high.
- 18.7.32 Mitigation will also be deployed during the operational phase of the Project, and is identified in Table 18.12. The significance of effect from direct disturbance or damage occurring from the operational and maintenance phase of the Project will therefore be of **minor adverse** significance at worst, which is not significant in EIA terms.

### Impact 5: Disturbance to Operations from the Physical Presence of Infrastructure

- 18.7.33 As outlined in Table 18.11, the design parameters for the Project state that up to 93 WTGs and seven offshore platforms (including two ORCPs) could be constructed. The study area for this potential impact is the Direct Study Area (see Figure 18.1). Infrastructure and assets that may be affected include:
- OWFs: Triton Knoll, Race Bank, Lincs, and DEP (assessed as constructed due to relevant project timeframes) (see Figure 18.2);

- Oil and gas activity:
  - Offshore platforms: Malory and Galahad (see Table 18.7 and Figure 18.5);
  - Subsea structures: Galahad Tee protective structure (see Paragraph 18.4.23 and Figure 18.6);
  - Pipelines: all overlapping with the Direct Study Area (as outlined in Table 18.8 and shown in Figure 18.6);
- Marine aggregate areas: Production Area 515/2 (Outer Dowsing) and Exploration and Option Area 1805 (Inner Dowsing), the latter assessed as a Production Area as a worst-case scenario (see Figure 18.7).

18.7.34 A number of embedded mitigation measures will be implemented during the operational phase (as detailed in Table 18.12), which included the detailing of physical infrastructure on all navigational charts and maps. This infrastructure will also have the relevant lighting and marking in accordance with Trinity House (TH) and the (AtoN) and Lighthouse Authorities (IALA).

#### *Magnitude of Impact*

18.7.35 Repair or maintenance works required on existing OWF infrastructure, particularly export cables, as well as oil and gas assets (platforms, subsea structures and pipelines) may be required in the vicinity of the Project during the operational phase. Restriction of access to an active cable or pipeline for inspection and maintenance activities could be critical to its operation. However, pipeline and cable proximity agreements are common across the UKCS and there are established mechanisms for controlling the level of impacts to both parties. Structures exclusion zones of 1nm will be in place around Malory platform and the Galahad Tee pipeline joint in order to allow for helicopter access for maintenance activities on these assets to continue uninhibited throughout the life of the Project. The impact is therefore predicted to be of local spatial extent, short-term duration, intermittent, and avoidable through the implementation of the mitigation outlined above, and has therefore been assessed as negligible.

18.7.36 The physical presence of infrastructure will also result in a reduction in available sea room to operate safely, potentially increasing the risk of allision between vessels and oil and gas infrastructure. However, although this impact is long-term, lasting for the lifetime of the Project, it is subject to embedded mitigation measures such as appropriate lighting and marking of infrastructure, as outlined in Table 18.12 and Paragraph 18.7.34. The magnitude of this impact is therefore considered to be negligible.

18.7.37 The presence of the Project WTGs during the operational and maintenance phase has the potential to obstruct or interfere with microwave links that may be used as part of the communications systems on oil and gas platforms. As outlined previously, consultation with Perenco has indicated the presence of the following microwave links:

- West Sole A to Malory;
- West Sole A to Lancelot;
- West Sole A to Excalibur; and

- Malory to Excalibur.

- 18.7.38 Microwave links operate on a LOS basis and may therefore be affected by the presence of Project infrastructure where it may interrupt this LOS, resulting in a loss of or interruptions to direct communication between platforms. An obstruction of this type would be of long-term duration, either the lifetime of the Project or until the relevant oil and gas installations are decommissioned. Consultation is currently ongoing with the relevant oil and gas operators and appropriate technical and commercial agreements will be sought to ensure that any interference to microwave links is minimised. This impact is therefore assessed to only represent a minor shift away from baseline conditions due to the appropriate application of mitigation measures (to be agreed with the operators), and has therefore been assessed as of low magnitude.
- 18.7.39 The presence of submarine cables has the potential to compromise the safe operation of marine aggregate interests if routed too close. There is the potential for the Project export cable to present a risk to aggregate areas located close by, particularly Area 515/2 and Area 1805 (see Figure 18.7). Consultation with the relevant operators is currently ongoing and appropriate proximity and commercial agreements will be put in place to ensure that any risks are appropriately managed. In addition, refinement of the ECC is being considered in order to further reduce potential impacts. The impact is predicted to be of local spatial extent, and although of long-term duration, mitigated through the use of commercial and technical agreements. This represents only a minor shift away from the baseline and has therefore been assessed as low magnitude.

#### *Sensitivity of the Receptor*

- 18.7.40 Repair or maintenance works may be required to existing OWF export cables or oil and gas assets, which could be restricted by the physical presence of Project infrastructure. The Applicant will liaise and engage with the relevant operators in order to arrange the necessary proximity and working practice agreements in order to reduce any risk to maintenance activities. Structures exclusion zones of 1nm will be in place around Malory platform and the Galahad Tee pipeline joint in order to allow for helicopter access for maintenance activities on these assets to continue uninhibited throughout the life of the Project. These assets are deemed to be of medium vulnerability, medium recoverability, and high value. However, due to the low likelihood of spatial and temporal overlap of proposed repair works, in addition to mitigation measures, the sensitivity of this receptor is considered to be low.

- 18.7.41 Microwave link between oil and gas platforms may be interrupted by the presence of Project WTGs, potentially interfering with communications. Oil and gas assets are of high value as interruption to communications could result in operational restrictions, although it should be noted that this will not result in any additional safety risk. Consultation is currently ongoing with the relevant oil and gas operators and appropriate technical and commercial agreements will be sought to ensure that any interference to microwave links is minimised. Furthermore, it should be noted that there are microwave communication links in operation, successfully running through windfarm infrastructure without obstruction or interference from the turbines. During consultation undertaken for the Hornsea Four project between Ørsted and Spirit Energy, it was noted that microwave links that which run across the West of Duddon Sands OWF have not experience any interference or obstruction from the windfarm infrastructure (Ørsted, 2021). Oil and gas assets are therefore considered to be of high value but low vulnerability, and the sensitivity of this receptor to the physical presence of infrastructure has been assessed as low.
- 18.7.42 There are two aggregate extraction areas located within the Direct Study Area, both in the Project ECC (Area 515/2 and Area 1805). Dredging operations are potentially sensitive to access restrictions and activity displacement, which could occur through anchor snagging or interaction with the export cables. Consultation with the relevant operators is currently ongoing and appropriate proximity and commercial agreements will be sought which will address any safety concerns prior to consent. Marine aggregates are therefore considered to be of medium value, high recoverability and moderate vulnerability, and therefore has been assessed as having medium sensitivity to the physical presence of infrastructure.

#### *Significance of Effects*

- 18.7.43 Based on the assessments of receptor sensitivity and impact magnitude made above, the significance of residual effect on IOMU receptors is considered as follows:
- It is predicted that the sensitivity of OWFs is low, and the magnitude of the impact is negligible. Therefore, the effect will be of **minor adverse** significance, which is not significant in EIA terms.
  - It is predicted that the sensitivity of oil and gas receptors (including surface and subsea structures, and pipelines) is low, and the magnitude of the impact is low (at worst). Therefore, the effect will be of **minor adverse** significance, which is not significant in EIA terms.
  - It is predicted that the sensitivity of marine aggregate sites is medium, and the magnitude of the impact is low. Therefore, the effect will be of **negligible** significance, which is not significant in EIA terms.

#### **Impact 6: Interference to Helicopter Access to Oil and Gas Infrastructure**

- 18.7.44 The operation of Project infrastructure has the potential to result in reduced helicopter access to oil and gas platforms in the vicinity of the Project. A detailed assessment of the potential impacts on helicopter operations at relevant oil and gas platforms has been carried out, with further details provided in Volume 2, Appendix 18.1: Helicopter Access Report.
- 18.7.45 The study area for this potential impact is the Helicopter Access Study Area (see Figure 18.1). Infrastructure and assets that may be affected include:

- Oil and gas activity:
  - Offshore platforms: Malory and Galahad (see Table 18.7 and Figure 18.5); and
  - Subsea structures: Galahad Tee protective structure (see Paragraph 18.4.23 and Figure 18.6).

### *Magnitude of Impact*

18.7.46 The potential effects of Project infrastructure on the relevant oil and gas assets have been fully assessed in Volume 2, Appendix 18.1: Helicopter Access Report. This assessment includes the Commercial Air Transport (CAT) weather limits, as a series of filters, to meteorological data provided in order to understand the potential operational impact on the oil and gas installations within the Helicopter Access Study Area. The study indicated that if the Project were in place:

- 1.8% of approaches to Excalibur between 2016 and 2021 would have been affected, with an additional 2.2% of take offs affected if sufficient take-off distance was not provided;
- 1.3% of flights to the West Sole Alpha platform between 2016 and 2021 would have been affected;
- Based on Vantage data from January 2019 to December 2021 for Malory, eighteen flights to the platform would have been affected in 2019, fourteen flights in 2020 and sixteen flights in 2021 (noting that inside a windfarm currently only CAT operations under Day Visual Meteorological Conditions (VMC) are permitted). Adjusting the timings of the affected flights by 30 minutes or more would have allowed access by a number of the affected flights; and
- Based on Vantage data from February 2020 to December 2022 for the Barque PB platform, 51 flights had occurred over the three-year period. The available meteorological data covering the first 37 flights, up until May 2021, showed that flights on only two days would have been delayed due to weather but VMC access was available later during those days. Based on the Vantage data provided, it was concluded that limiting the Barque PB to day VMC only operations would have had a minimal effect on historic helicopter operations.

18.7.47 Full details are provided in Volume 2, Appendix 18.1: Helicopter Access Report. In addition, Search and Rescue (SAR) helicopters operated on behalf of the MCA are not constrained by CAT meteorological limits. Project infrastructure will be compliant with MGN 654, and therefore will not inhibit SAR access to oil and gas assets. SAR helicopters will be tasked for major incidents, accidents, and urgent medivacs, rather than CAT helicopters. Therefore, any reduction in CAT helicopter access will result in a logistic impact on the installation operator, rather than a safety impact. This impact is considered to represent a minor shift to the baseline conditions, particularly as the safety of operations will not be impacted, and has therefore been assessed as having a low magnitude.



### *Sensitivity of the Receptor*

18.7.48 Consultation with the relevant operators is ongoing, and will be considered within the layout design process. Oil and gas assets are of high value and high vulnerability if helicopter access for maintenance and operation works is disrupted. Helicopters may be required to change routes and extend their routes, which may cause delays and disruption to operational and maintenance works. However, through consultation this will be discussed with the operators and agreements established to ensure any losses and displacement are minimal. Therefore, oil and gas infrastructure within the Helicopter Access Study Area has been assessed as being having medium sensitivity.

### *Significance of Effects*

18.7.49 Based on the assessments of receptor sensitivity and impact magnitude made above, the significance of residual effect on IOMU receptors is considered as follows:

- It is predicted that the sensitivity of oil and gas receptors (including surface and subsea structures) is medium, and the magnitude of the impact is low. Therefore, the effect will be of **minor adverse** significance, which is not significant in EIA terms.

### *Decommissioning*

18.7.50 The nature and scale of impacts arising from decommissioning are expected to be of similar or reduced magnitude to those generated during the construction phase. Certain activities, such as piling, will not be required.

18.7.51 It is possible that closer to the time of decommissioning, in discussion with relevant regulators and statutory bodies, it will be determined that removal of certain parts of the development (such as cables) will have a greater environmental impact than leaving the subsurface infrastructure *in situ*. In such an eventuality, and for these components of the Project, the scale of impacts will be further reduced relative to those generated during the construction phase.

18.7.52 To date, no large offshore windfarm has been decommissioned in UK waters. It is anticipated that any future programme of decommissioning will be developed in close consultation with the relevant statutory marine and nature conservation bodies. This will enable the guidance and best practice at the time to be applied in order to minimise any potential impacts.

### *Impact 7: Activity or Access Displacement Associated with Increased Vessel Movements and the Use of Safety Zones During Decommissioning Activities*

18.7.53 Increases in vessel movements and the physical presence of temporary safety zones (500m) during the decommissioning works will be similar to those for construction. The magnitude of impacts and the sensitivities of IOMU receptors to this impact are described in detail in Paragraph 18.7.1 *et seq.* The study area for this potential impact is the Direct Study Area, as shown in Figure 18.1. Infrastructure and assets that may be affected are outlined in Paragraph 18.7.3.

18.7.54 The magnitude of the impacts has been assessed as negligible to low, with the maximum sensitivity of the receptors being medium.



18.7.55 Mitigation will also be deployed during the decommissioning phase of the Project, the details of which are anticipated to be informed by guidance and best practice at the time. The significance of effect from activity or access displacement occurring from the operational phase of the Project will therefore be of **minor adverse** significance at worst, which is not significant in EIA terms.

#### Impact 8: Direct Disturbance and Damage to Existing Assets and Infrastructure from Decommissioning Activities

18.7.56 The potential for direct disturbance and damage to existing assets and infrastructure from decommissioning works will be similar to those for construction and of a similar magnitude. The magnitude of the impact and sensitivities of IOMU receptors to this impact are described in detail in Paragraph 18.7.16 *et seq.*

18.7.57 The study area for this potential impact is the Direct Study Area, as shown in Figure 18.1. Infrastructure and assets that may be affected are outlined in Paragraph 18.7.17.

18.7.58 The magnitude of the impacts has been assessed as negligible, with the maximum sensitivity of the receptors being high.

18.7.59 Mitigation will also be deployed during the decommissioning phase of the Project, the details of which are anticipated to be informed by guidance and best practice at the time. The significance of effect from direct disturbance or damage occurring from the decommissioning phase of the Project will therefore be of minor adverse significance at worst, which is not significant in EIA terms.

### 18.8 Cumulative Impact Assessment

18.8.1 This cumulative impact assessment for IOMU has been undertaken in accordance with the methodology provided in Volume 1, Annex 5.1: Offshore Cumulative Effects Assessment.

18.8.2 The projects and plans selected as relevant to the assessment of impacts to IOMU are based on an initial screening exercise undertaken on a long list. Each project, plan or activity has been considered and scoped in or out on the basis of effect receptor pathway, data confidence and the temporal and spatial scales involved. For the purposes of assessing the impact of the Project on IOMU in this region, the cumulative effect assessment technical note submitted through the EIA Evidence Plan and forming Volume 1, Appendix 5.1 of this PEIR screened in a number of projects and plans as presented in Table 18.16.

18.8.3 Only those projects where sufficient certainty in the project details and timescales are available have been screened into the assessment at this stage. For all extant plans, projects and activities, it is considered that these are all part of the baseline for the assessment, and therefore have been considered within the Project-alone assessment in Section 18.7. Full details of the plans, projects and activities considered within the long-list are provided in Volume 1, Appendix 5.1.

Table 18.16: Projects considered within the IOMU cumulative effect assessment

Development type	Project	Status	Data confidence assessment/phase	Tier
Offshore Energy	Dudgeon Extension Project (DEP)	Under Examination	High – Third party project details published in the public domain and confirmed as being ‘accurate’ by the Crown Estate	1
	Sheringham Shoal Extension			
Aggregate Areas	Inner Dowsing Hanson Aggregates Marine Ltd (1805)	Operational (Exploration and Option Area; application for Production Area expected shortly)	High – Third party project details published in the public domain and confirmed as being ‘accurate’ by the Crown Estate	2
	Aggregate Tender Area (2103)	Tender Area (2021/2022)	Low – No information available	3

18.8.5 The cumulative MDS for the Project is outlined in Table 18.17.

Table 18.17: Cumulative MDS

Impact	Scenario	Justification
Impact 9: Cumulative activity or access displacement associated with increased vessel movements and the use of safety zones	Tier 1 ■ DEP OWF (Construction) Tier 2 ■ Aggregate Area 1805 (Operational Exploration and Option Agreement; application for Production Area expected shortly) Tier 3 ■ Aggregate Tender Area 2103	Activities relating to the construction of DEP will result in increased vessel movements and the use of construction safety zones.
Impact 10: Cumulative interference to helicopter access to oil and gas infrastructure	Tier 1 ■ DEP OWF (Operation)	The presence of physical infrastructure as part of DEP may result in cumulative interference to helicopter access to oil and gas installations.

18.8.6 A description of the significance of cumulative effects on IOMU receptors arising from each identified impact is given below. The cumulative effects assessment has been based on information publicly available in the ESs for other developments. It is noted that the maximum assessment assumptions quoted within these ESs are often refined during the determination period and in the post-consent phase such that the final schemes built out may have a reduced impact when compared to what has previously been assessed.

18.8.7 Due to uncertainty associated with the exact timing of other projects and activities, there is insufficient data on which to undertake a quantitative or semi-quantitative assessment. As such, the discussion presented here is qualitative. It is considered highly unlikely that each of the identified projects would be undertaking major maintenance works, as these are infrequent occurrences during the lifetime of developments.

18.8.8 With regard to Aggregates Area 2103, there is not currently any information on the timescales associated with the project and consequently it is not possible to undertake an assessment of the likely impacts. Notwithstanding, it should also be noted that this project would commence as an Exploration and Option Area, and as such there is no clarity on the final production area which may be progress if granted a licence. Additionally, a high-level review of the geophysical data held by the Project of the relevant section of the Offshore ECC indicates that there is limited aggregates material available for extraction. Therefore it is considered unlikely on the basis of available information that the Project Offshore ECC would comprise a key part of any final production area. Therefore no assessment has been made of potential cumulative effects to Area 2103 at this stage. If further information is available prior to submission of the ES, an updated assessment will be undertaken.

- 18.8.9 With regard to Aggregates Area 1805, this is currently an Exploration and Option Area, with no application having been submitted prior to preparation of the PEIR. However, it is anticipated that a production licence will be applied for prior to cessation of the option agreement in 2024. As such, for the purposes of the Project-alone assessment, the worst-case assumption was that this could be a Production Area during the construction and operation of the Project. Therefore, full assessment of the potential impacts has been considered within the Project-alone assessment in Section 18.7, and a repeat assessment has not been included within the cumulative effects assessment below.

#### Impact 9: Cumulative Activity or Access Displacement Associated with Increased Vessel Movements and the Use of Safety Zones

- 18.8.10 There is potential for impacts arising from increased vessel movements and use of safety zones as a result of activities associated with the Project in addition the construction activities of the DEP OWF (see Table 18.17). Operational and maintenance activities for existing infrastructure has been screened out of assessment, based on the fact that these maintenance activities are generally short-lived, with major maintenance works infrequent. Any impacts from operational OWFs, pipelines, and other oil and gas platforms are therefore likely to be short-lived and of localised extent, with limited opportunity to overlap with Project related activities. The DEP OWF is currently going through the Examination process, and if granted consent, will overlap with the 1km buffer around the Project ECC, with construction scheduled to take place between 2026 and 2028.
- 18.8.11 These impacts will be informed by the assessment carried out within Volume 1, Chapter 15: Shipping and Navigation. Potential impacts will be mitigated through the use of a VMP and advanced warning of construction activities through NtM (as outlined in Table 18.12), therefore ensuring potential impacts are appropriately managed. It is therefore considered that due to the implementation of this mitigation, there will be limited scope for cumulative impacts on IOMU receptors.
- 18.8.12 The sensitivity of IOMU receptors to activity and access displacement is detailed in Paragraph 18.7.1 *et seq.*, which concluded that IOMU receptors have low and medium sensitivity to increased vessel movements and the use of safety zones, with a low to medium magnitude of impact, depending on receptor. The overall significance of effect has been assessed as not significant. Taking into consideration the localised, short-term nature of the impacts it is concluded that the significance of effect from cumulative activity or access displacement is of **minor adverse** significance at worse, which is not significant in EIA terms.

#### Impact 10: Cumulative Interference to Helicopter Access to Oil and Gas Infrastructure

- 18.8.13 The potential cumulative effect of nearby additional windfarm projects currently in the planning phase (including DEP and Sheringham Extension Project (SEP)) has been fully assessed in Volume 2, Appendix 18.1: Helicopter Access Report. The study indicated that in addition to the Project being in place:
- If the DEP OWF is also built, the number of affected approaches to Excalibur will increase from 1.8% to 2.0%, with no additional take-off penalty compared to the Project alone.

18.8.14 Full details are provided in Volume 2, Appendix 18.1: Helicopter Access Report, which has informed this assessment. The sensitivity of IOMU receptors, notably oil and gas infrastructure, to interference to helicopter access is detailed in Paragraph 18.7.48, which concluded that IOMU receptors have medium sensitivity to interference to helicopter access. Cumulative interference, as outlined above, would only represent a minor shift to the baseline conditions, and furthermore will not impact the safety of operations (as outlined in Paragraph 18.7.48). The magnitude of impact has therefore been assessed as low, with the overall significance of effect assessed as being of **minor adverse** significance, which is not significant in EIA terms.

## 18.9 Inter-Relationships

18.9.1 Inter-relationships are those impacts and associated effects of different aspects of the proposed Project on the same receptor. Such inter-related effects include both:

- Receptor-led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on benthic ecology such as direct habitat loss or disturbance, sediment plumes, scour, etc., may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects may be short-term, temporary or transient but may also incorporate longer term effects; and
- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the Project (construction, operation and maintenance and decommissioning); to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three key project stages (for example subsea noise effects from piling, operational WTGs, vessels and decommissioning).

18.9.2 The assessment of potential effects on IOMU receptors provided in Section 18.7 inherently considers the inter-relationships between biological and human environment receptors. The assessment makes reference to and is informed by the assessments provided in Volume 1, Chapter 12: Shipping and Navigation. Inter-relationships relevant to the IOMU assessment have therefore not been considered further.

## 18.10 Transboundary Effects

18.10.1 The approximate distances of the Project from the Exclusive Economic Zone (EEZ) boundaries of other EEA states is shown in Table 1.2 of Volume 1, Chapter 5: EIA Methodology, alongside an outline of the methodology for assessing transboundary effects.

18.10.2 Due to the localised nature of any potential impacts on IOMU receptors, all of which lie wholly within the UK EEZ, together with the mitigation options available (Table 18.12), transboundary impacts will not occur on any current built IOMU.

18.10.3 As outlined in Table 18.12, the Scoping Opinion noted the presence of the Viking Link Interconnector and stated that likely effects on this receptor should be considered within an assessment of transboundary impacts. The Viking Link Interconnector is not located within the Direct Study Area, and as detailed in Paragraph 18.4.33, has been scoped out of assessment based on there being no pathway to LSE. Transboundary impacts will not occur through potential effects on the Viking Link Interconnector from Project infrastructure.

## 18.11 Conclusions

18.11.1 A summary of potential impacts assessed within this PEIR, alongside any mitigation and residual effects, is presented in Table 18.18 below.

Table 18.18: Summary of potential impacts of the Project assessed for IOMU

Description of effect	Effect	Additional mitigation measures	Residual impact
<b>Construction</b>			
Effect 1: Activity or Access Displacement Associated with Increased Vessel Movements and the Use of Safety Zones During Project Construction Activities	Minor adverse significance of effect	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Effect 2: Direct Disturbance and Damage to Existing Assets and Infrastructure from Construction Activities	Minor adverse significance of effect	Not Applicable – no additional mitigation identified	No significant adverse residual effects
<b>Operation and Maintenance</b>			
Effect 3: Activity or Access Displacement Associated with Increased Vessel Movements and the Use of Safety Zones During Operational and Maintenance Activities	Minor adverse significance of effect	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Effect 4: Direct Disturbance and Damage to Existing Assets and Infrastructure from Operational and Maintenance Activities	Minor adverse significance of effect	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Effect 5: Disturbance to Operations from the Physical Presence of Infrastructure	Minor adverse significance of effect	Not Applicable – no additional mitigation identified	No significant adverse residual effects
Effect 6: Interference to Helicopter Access to Oil and Gas Infrastructure	Minor adverse significance of effect	Not Applicable – no additional mitigation identified	No significant adverse residual effects
<b>Decommissioning</b>			
Effect 7: Activity or Access Displacement Associated with Increased Vessel	Minor adverse significance of effect	Not Applicable – no additional mitigation identified	No significant adverse residual effects

Description of effect	Effect	Additional measures	mitigation	Residual impact
Movements and the Use of Safety Zones During Decommissioning Activities				
Effect 8: Direct Disturbance and Damage to Existing Assets and Infrastructure from Decommissioning Activities	Minor adverse significance of effect	Not Applicable – no additional identified	no mitigation	No significant adverse residual effects
Cumulative				
Effect 9: Cumulative Activity or Access Displacement Associated with Increased Vessel Movements and the Use of Safety Zones	Minor adverse significance of effect	Not Applicable – no additional identified	no mitigation	No significant adverse residual effects
Effect 10: Cumulative Interference to Helicopter Access to Oil and Gas Infrastructure	Minor adverse significance of effect	Not Applicable – no additional identified	no mitigation	No significant adverse residual effects



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