Liverpool Bay CCS Ltd
HYNET CARBON DIOXIDE TRANSPORTATION AND STORAGE PROJECT - OFFSHORE

Environmental Statement
Volume 2, chapter 12: Infrastructure and Other Sea Users

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Liverpool Bay CCS Limited
Final
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Offshore ES
Infrastructure and Other Sea Users

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Glossary

Term	Meaning
Environmental Impact Assessment	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 Impact Assessment (EIA) Report.
Magnitude	Size, extent and duration of an impact.
Maximum Design Scenario	The maximum design parameters of each Proposed Development asset (both on and offshore) considered to be a worst case for any given assessment but within the range of the Project Description Envelope.
Mitigation Measure	Measure which would avoid, reduce, or remediate an impact
Project	The HyNet Carbon Dioxide Transportation and Storage Project.
Project Design Envelope (PDE)	Also known as the Rochdale Envelope, the PDE concept is routinely utilised in both onshore and offshore planning applications to allow for some flexibility in design options, particularly offshore, and more particularly for foundations and turbine type, where the full details of the project are not known at application submission but where sufficient detail is available to enable all environmental impacts to be appropriately considered during the EIA.
Proposed Development	The offshore components of the Project which are subject of this Environmental Statement, as described in volume 1, chapter 3.
The Applicant	This is Liverpool Bay CCS Ltd.

Acronyms and Initialisations

Acronym/Initialisation	Description
AIS	Automatic Identification System
CCS	Carbon Capture and Storage
CEA	Cumulative Effects Assessment
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CSIP	Cable Specification and Installation Plan
CTV	Crew Transfer Vessel
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESCA	European Subsea Cables UK Association
EMODnet	European Marine Observation and Data Network
HDD	Horizontal Directional Drilling
HRA	Habitats Regulations Appraisal
ICPC	International Cable Protection Committee
KIS-ORCA	Kingfisher Information Service – Offshore Renewables and Cable Awareness
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
NRA	Navigational Risk Assessment
NSTA	North Sea Transition Authority
OP	Offshore Platform
PDE	Project Design Envelope
PEXA	Military Practice and Exercise Areas
RIAA	Report to Inform Appropriate Assessment

Acronym/Initialisation	Description
RYA	Royal Yachting Association
SSC	Suspended Sediment Concentration
TCE	The Crown Estate
UKHO	United Kingdom Hydrographic Office

Units

Unit	Description
%	Percent
km	Kilometres
km^2	Kilometres squared
m	Metres (distance)
m^2	Metres squared (area)
m^3	Metres cubed (volume)
MW	Megawatt

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12 INFRASTRUCTURE AND OTHER SEA USERS

12.1 Introduction

This chapter of the Offshore Environmental Statement (ES) presents the assessment of the likely significant effects (as per the 'EIA Regulations') on the environment of the Proposed Development on infrastructure and other sea users. Specifically, this chapter considers the potential impacts from the construction, operation and maintenance, and decommissioning of the offshore and intertidal components (seaward of the Mean High Water Springs (MHWS) mark) of the development area, which includes the pipelines and cables leading to MHWS.

Likely significant effect is a term used in both the 'EIA Regulations' and the Habitat Regulations. Reference to likely significant effect in this Offshore ES refers to 'likely significant effect' as used by the 'EIA Regulations'. This Offshore ES is accompanied by a Report to Inform Appropriate Assessment (RIAA) which uses the term as defined by the Habitats Regulations Appraisal (HRA) Regulations.

12.2 Purpose of this chapter

The primary purpose of the Offshore ES is outlined in volume 1, chapter 1. It is intended that the Offshore ES will provide the statutory and non-statutory stakeholders, with sufficient information to determine the likely significant effects of the Proposed Development on the receiving environment. In particular, this Infrastructure and Other Sea Users ES chapter:

- presents the existing environmental baseline established from desk studies and consultation;
- identifies any assumptions and limitations encountered in compiling the environmental information;
- presents the potential environmental effects on infrastructure and other sea users arising from the Proposed Development, based on the information gathered and the analysis and assessments undertaken; and
- highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce, or offset the possible environmental effects of the Proposed Development on infrastructure and other sea users.

12.3 Study area

The infrastructure and other sea users study area varies in scale depending on the receptor. Two study areas have been defined for the assessment of two different groupings of receptors. These are the infrastructure and other sea users regional study area (1,579.2 km^2), and the infrastructure and other sea users local study area (205.0 km^2), as shown in Figure 12.1.

The infrastructure and other sea users local study area is defined as a 1 km buffer around the Proposed Development infrastructure. A 1 km buffer has been included because while undergoing maintenance, oil and gas infrastructure, cables and pipelines, and offshore wind farm structures will require a 500 m safety zone, or advisory clearance distance. This area includes the extent of potential direct physical overlap between activities associated with the Proposed Development and the following receptors:

- recreational activities including, sailing and motor cruising, and recreational fishing;
- offshore energy projects (including offshore wind farms, oil and gas activities and carbon capture and storage);
- cable and pipeline operators; and
- offshore microwave fixed communication links.

The infrastructure and other sea users regional study area represents one tidal excursion from any Proposed Development infrastructure, as this will be the furthest extent any sediment disturbed by activities associated with the Proposed Development will be carried to. This study area is relevant to those receptors which are susceptible to increases in Suspended Sediment Concentrations (SSCs):

- aggregate extraction and disposal sites; and
- recreational activities such as scuba diving and bathing.

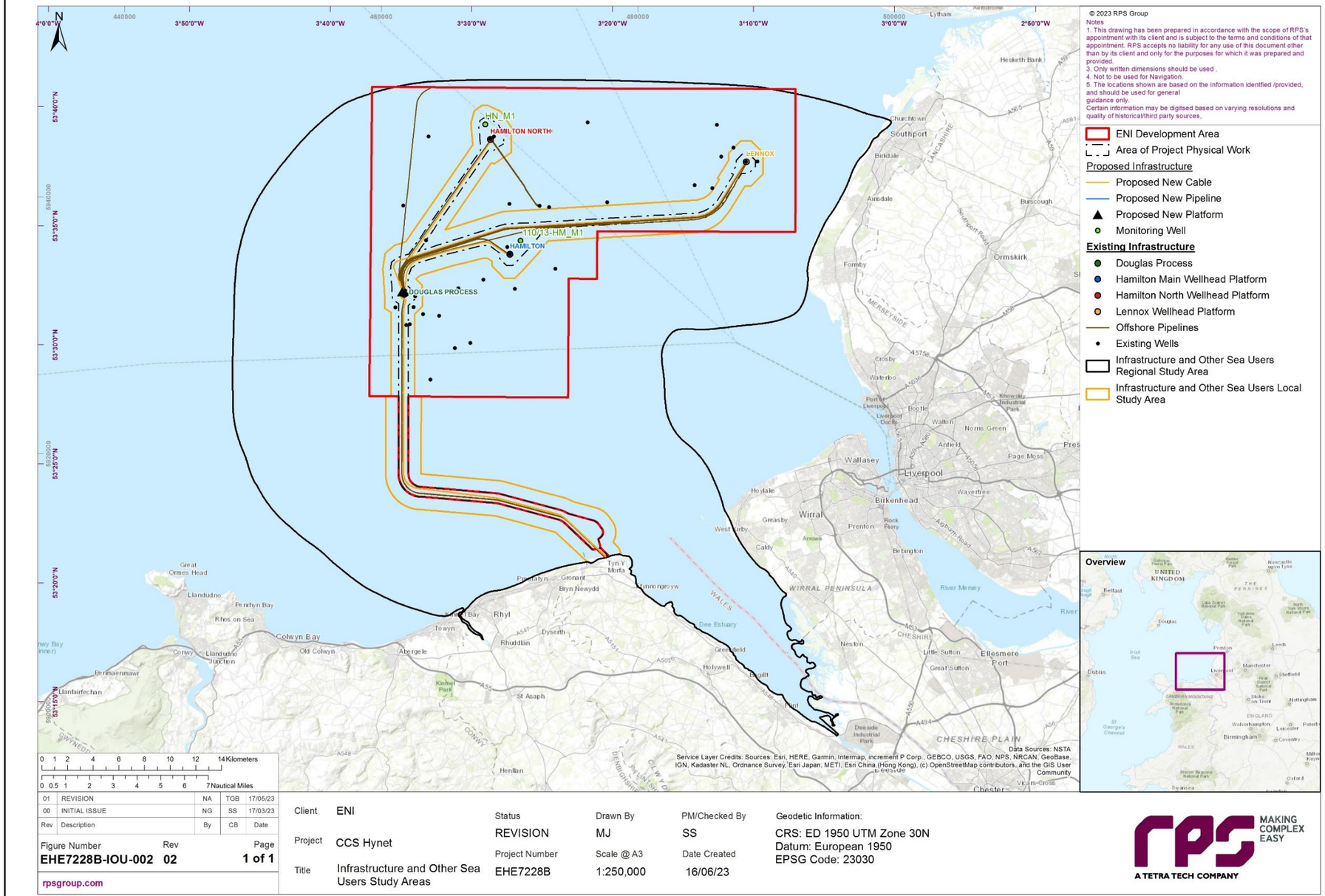

Figure 12.1: The Infrastructure And Other Sea Users Study Areas

12.4 Policy and legislative context

The policy context for the Proposed Development is set out in volume 1, chapter 2. Specific policy relevant to infrastructure and other sea users is laid out below.

12.4.1 Marine plans

The assessment of potential changes to other sea users has also been made with consideration to the specific policies set out in the North West Inshore and North West Offshore Coast Marine Plans (MMO, 2021) and Welsh National Marine Plan (WNMP) (Welsh Government, 2019). Key provisions are set out in Table 12.1 along with details as to how these have been addressed within the assessment.

Table 12.1: Summary Of Inshore And Offshore Marine Plan Policies Of Relevance To Infrastructure And Other Sea Users

Policy	Key provisions	How and where considered
North West Inshore and North West Offshore Coast Marine Plan		
NW-AGG-1	Proposals in areas where a licence for extraction of aggregates has been granted or formally applied for should not be authorised, unless it is demonstrated that the proposal is compatible with aggregate extraction.	Figure 12.2 shows potential overlap between the Proposed Development and marine aggregate extraction sites. Measures adopted as part of the Proposed Development (with relevance to infrastructure and other sea users) are contained in section 12.10, and an assessment of impacts is contained in section 12.11.
NW-CO-1	Proposals that may have significant adverse impacts on, or displace, existing activities must demonstrate that they will, in order of preference: Avoid Minimise Mitigate adverse impacts so they are no longer significant. If it is not possible to mitigate significant adverse impacts, proposals must state the case for proceeding.	Measures adopted as part of the Proposed Development (with relevance to other sea users) are contained in section 12.10, and an assessment of impacts is contained in section 12.11.
NW-CAB-1	Preference should be given to proposals for cable installation where the method of protection 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 burial or protection measures are not appropriate, proposals should state the case for proceeding without those measures.	Cable burial is one of the measures adopted as part of the Proposed Development listed in section 12.10.
NW-CAB-3	Where seeking to locate close to existing subsea cables, proposals should demonstrate compatibility with ongoing function, maintenance and decommissioning activities relating to the cable.	Cable crossing and proximity agreements are measures adopted as part of the Proposed Development listed in section 12.10.
NW-OG-1	Proposals in areas where a licence for oil and gas has been granted or formally applied for should not be authorised unless it is demonstrated that the other development or activity is compatible with the oil and gas activity.	Impacts upon oil and gas licence blocks are considered within section 12.11.6.

Policy	Key provisions	How and where considered
Welsh National Marine Plan		
SAF_01	Proposals likely to have significant adverse impacts upon an established activity covered by a formal application or authorisation must demonstrate how they will address compatibility issues with that activity. Proposals unable to demonstrate adequate compatibility must present a clear and convincing case for the proposal to progress under exceptional circumstances. Proposals likely to have significant adverse impacts upon an established activity not subject to a formal authorisation must demonstrate how they will address compatibility issues with that activity. Proposals unable to demonstrate adequate compatibility must present a clear and convincing case for proceeding.	This chapter covers established activities such as aggregate extraction and disposal, infrastructure, and recreational activities. Impacts on these activities are assessed in section 12.11. Measures adopted as part of the Proposed Development to reduce and/or avoid adverse impacts are presented in section 12.10.

12.5 Consultation

A summary of the key issues raised during consultation activities undertaken to date specific to infrastructure and other sea users is presented in Table 12.2 below, together with how these issues have been considered in the production of this chapter.

Table 12.2: Summary Of Key Consultation Issues Raised During Consultation Activities Undertaken For The Proposed Development Relevant To Infrastructure And Other Sea Users

Date	Consultee and type of response	Issues raised	Response to issue raised and/or were considered in this chapter
January 2023	OPRED - Scoping opinion	It is advised that nearshore works are undertaken outside of the Bathing Season (15th May to 30th September) to avoid risks to bathers associated with contaminant releases.	Noted and programme will take this into consideration where operationally practicable.

12.6 Methodology to inform the baseline

12.6.1 Desktop study

Information on infrastructure and other sea users within the infrastructure and other sea users study areas was collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 12.3 below.

Table 12.3: Summary Of Key Desktop Reports

Title	Source	Year	Author
Cable routes	Kingfisher Information Service – Offshore Renewables and Cable Awareness (KIS-ORCA)	2021	KIS-ORCA
Disposal sites	European Marine Observation and Data Network (EMODnet)	2015	EMODnet
Offshore wind farms	The Crown Estate (TCE)	2022	TCE
Aggregate extraction areas	TCE	2022	TCE
Pipelines	North Sea Transition Authority (NSTA)	2022	NSTA
Wells	NSTA	2022	NSTA
Hydrocarbon platforms	NSTA	2022	NSTA
Subsurface structures	NSTA	2022	NSTA
Hydrocarbon fields	NSTA	2022	NSTA
Oil and gas licence blocks	NSTA	2022	NSTA
United Kingdom Continental Shelf (UKCS) block	NSTA	2022	NSTA
Marinas	UK Coastal Atlas of Recreational Boating	2018	Royal Yachting Association (RYA)
Recreational activities	UK Coastal Atlas of Recreational Boating	2018	RYA
RYA clubs	UK Coastal Atlas of Recreational Boating	2018	RYA
RYA training centres	UK Coastal Atlas of Recreational Boating	2018	RYA
General boating areas	UK Coastal Atlas of Recreational Boating	2018	RYA
Data from marine vessel traffic surveys	MarineTraffic	2019	MarineTraffic
Wrecks (diving sites)	UK Diving	2010	UK Diving
Communication links	Ofcom	2019	Ofcom
Recreational fishing	Centre for Environment, Fisheries and Aquaculture Science (Cefas) British Sea Fishing	2021 2020	Cefas British Sea Fishing

No site-specific surveys have been undertaken to provide information for infrastructure and other sea users. This is because a sufficient amount of information is already available (Table 12.3). The majority of the data used to inform this chapter has been taken from these desktop studies. Survey data from 2019 MarineTraffic surveys has been incorporated in the form of Automatic Identification System (AIS) tracks for recreational vessels (Figure 12.3).

12.7 Baseline environment by study area

12.7.1 Infrastructure and other sea users regional study area

Other sea users receptors within the infrastructure and other sea users regional study area include:

- Marine aggregate extraction sites.
- Marine disposal sites.
- Marine recreational dive sites.

The baseline environment for these receptors is described below.

12.7.1.1 Marine aggregate extraction sites

As per Figure 12.2, there are two open licensed marine aggregate extraction sites within the infrastructure and other sea users regional study area:

- Liverpool Bay Area 457, operated by Westminster Gravels Ltd, located north of the Douglas Process Platform (also within the infrastructure and other sea users local study area).
- Hilbre Swash 393, owned by Mersey Sand Suppliers, located southwest of the Douglas Process Platform.

Dredger routes are considered within volume 2, chapter 10.

12.7.1.2 Marine aggregate disposal sites

As per Figure 12.2, there are six closed, one disused and two open licensed marine aggregate disposal areas within the infrastructure and other sea users regional study area. The two open sites are:

- Site Y (IS150), which is also within the infrastructure and other sea users local study area.
- Site Z (IS140).

Only marine sediment dredged from dock sites and navigation channels and small amounts of fish waste are permitted to be disposed of at sea, with industrial waste banned since 1992 and sewage sludge since 1998 (Cefas, 2009).

12.7.1.3 Recreational dive sites

There are six wreck diving sites within the infrastructure and other sea users regional study area (Figure 12.3).

12.7.1.4 Recreational bathing sites

There are eight recreational bathing sites within the infrastructure and other sea users regional study area (Figure 12.3).

12.7.1.5 Military Practice and Exercise Areas

Military Practice and Exercise Areas (PEXAs) are areas available for training use primarily by the UK armed forces but also those of overseas nations. There are no PEXAs located within other sea users regional study area and consequently there will be no direct obstruction created to activities conducted in PEXAs.

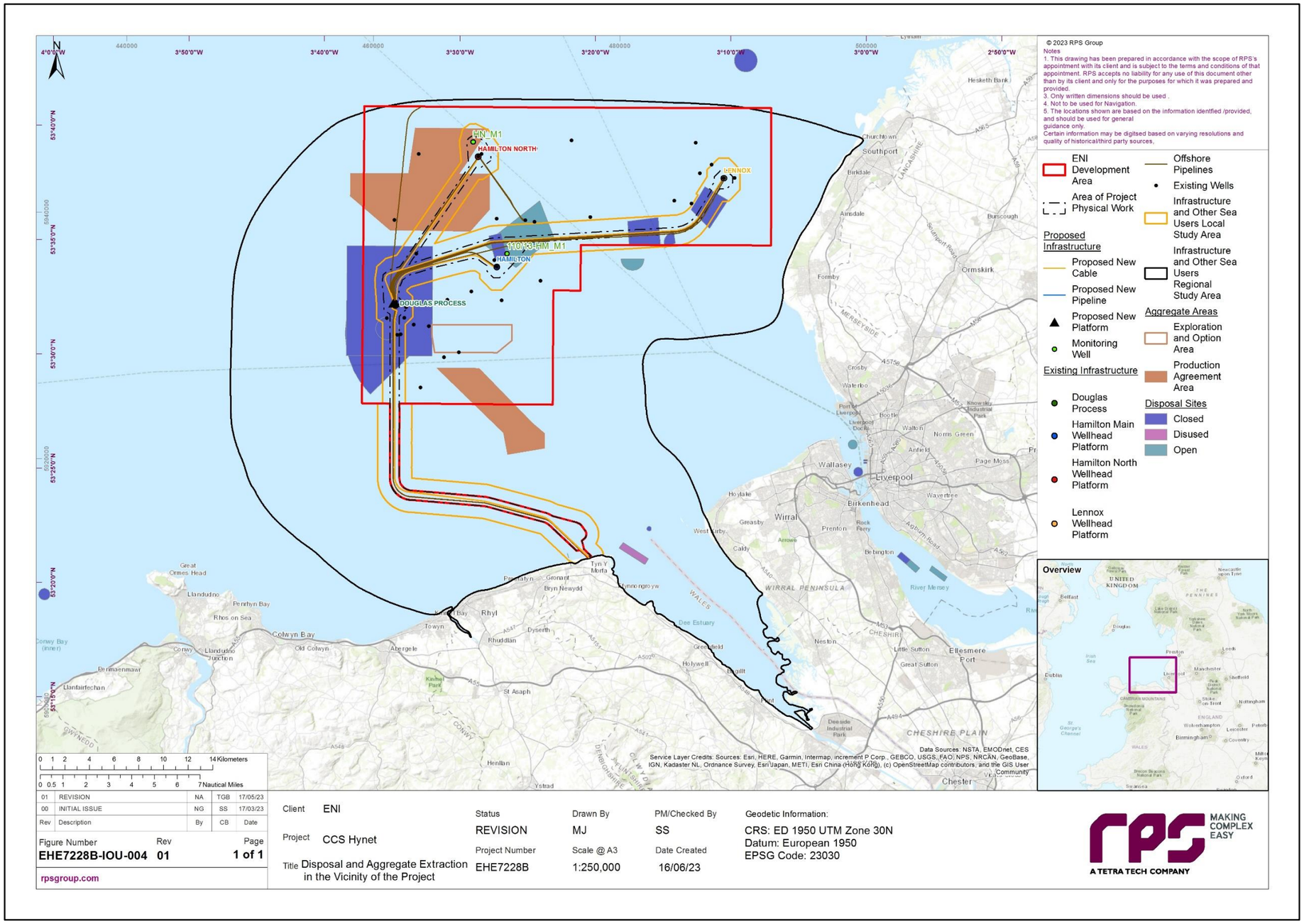

Figure 12.2: Marine Aggregate Extraction And Disposal Sites In The Vicinity Of The Proposed Development

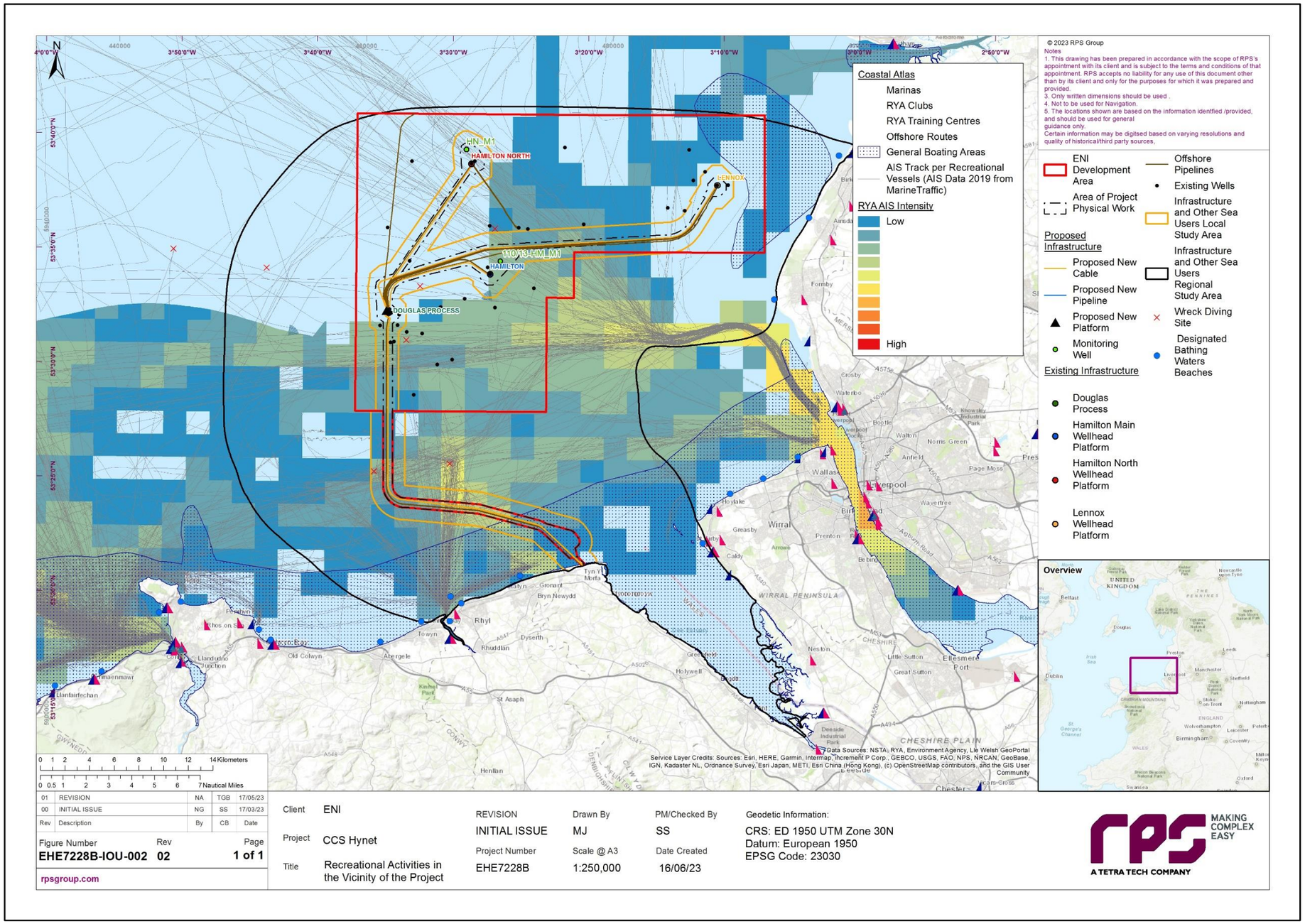

Figure 12.3: Recreational Activities In The Vicinity Of The Proposed Development

12.7.2 Infrastructure and other sea users local study area

Other sea users receptors within the infrastructure and other sea users local study area include:

- Offshore energy projects (including offshore wind farms, oil and gas activities and carbon capture and storage).
- Cable and pipeline operators.
- Offshore microwave fixed communication links.
- Recreational activities such as sailing and motor cruising, and recreational fishing.

The baseline environment for these receptors is described below.

12.7.2.1 Recreational sailing and motor cruising

Recreational sailing is generally divided into two categories: offshore and inshore. Offshore sailing is usually undertaken by yachts in the form of either cruising or organised offshore racing. Cruising may include day trips between local ports and often includes a return journey to the home port on the same day.

Navigational safety and risk to recreational vessels is considered in volume 3, appendix L: Navigational Risk Assessment (the NRA). The other sea users chapter will only consider receptors undertaking recreational sailing and motor cruising as an activity.

The RYA data is limited to inshore waters, but AIS data tracks show that recreational vessels transit through offshore waters within the infrastructure and other sea users local study area. There is medium to low recreational activity over the majority of the infrastructure and other sea users local study area.

12.7.2.2 Recreational fishing

Sea fishing trips run from Conwy, North Wales and specialise in wreck fishing, deep sea fishing and reef fishing from Anglesey to Liverpool Bay (Sea Fishing Trips in North Wales, 2022). Sea fishing trips also operate from the Isle of Man (Manx Sea Fishing, 2022) and Fleetwood, Lancashire (Blue Mink Boat Charters, 2022) amongst other ports along the coasts of the east Irish Sea.

12.7.3 Infrastructure

12.7.3.1 Offshore wind farms

There are a number of proposed and operational offshore wind farms in the east Irish Sea, the closest of which are shown in Figure 12.4. There is spatial overlap between a number of proposed or operational wind farms and the infrastructure and other sea users local study area as shown in Table 12.4 .

Four bidding areas for leasing under TCE Offshore Wind Leasing Round 4 were released in September 2019, three of which are located in the Irish Sea; The Morgan Offshore Wind Project (being developed by bp/EnBW), the Mona Offshore Wind Project (being developed by bp/EnBW) and the Morecambe Offshore Windfarm (being developed by Offshore Wind Ltd, a joint venture between Cobra Instalaciones y Servicios, S.A. and Flotation Energy).

Within Isle of Man territorial waters, Ørsted has signed an Agreement for Lease allowing them to investigate an area for a proposed offshore wind farm.

More information on the other offshore wind farms in the east Irish Sea is contained in Table 12.4.

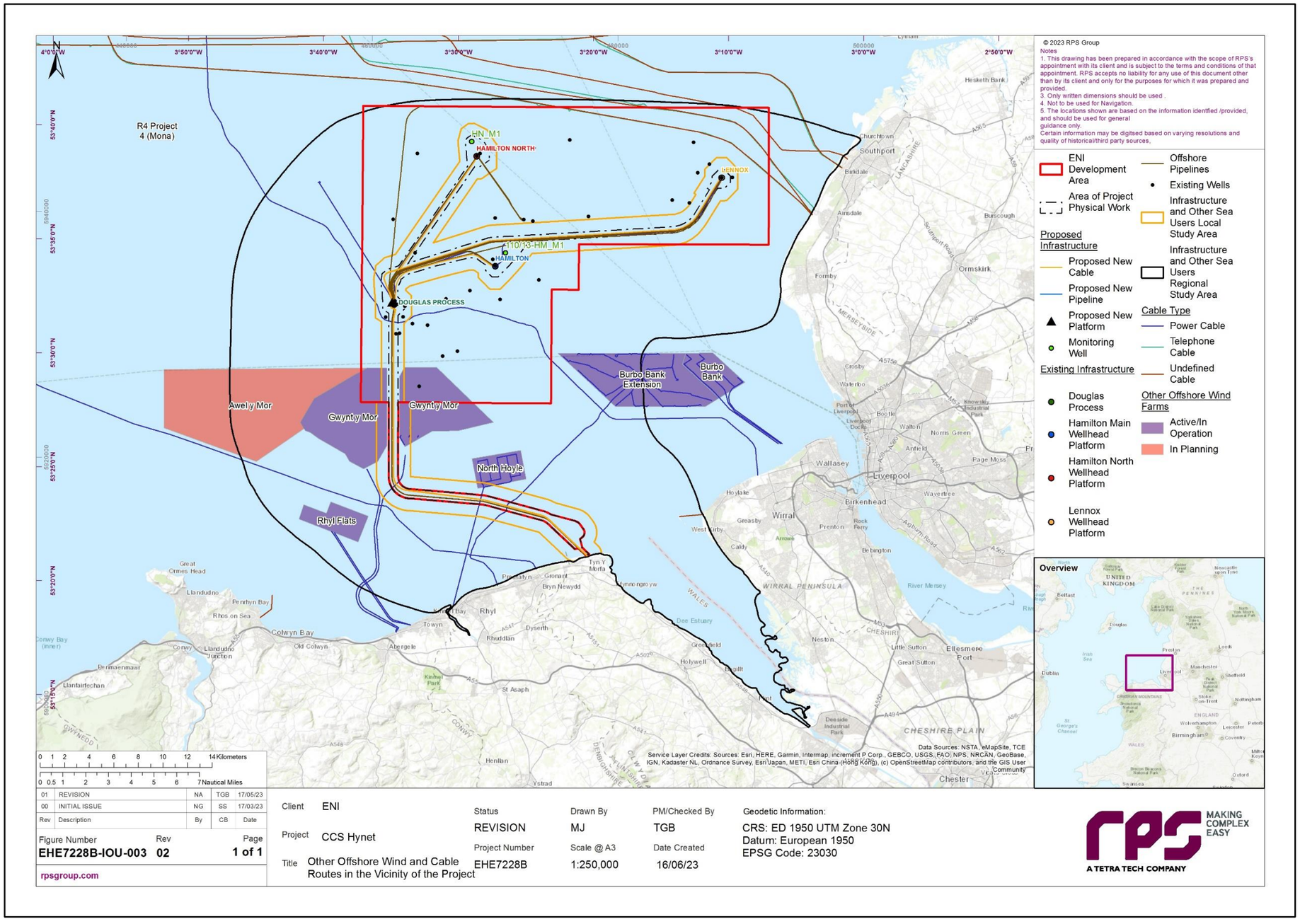

Figure 12.4: Offshore Wind Farms And Cables In The Vicinity Of The Proposed Development

Table 12.4: Offshore Wind Farms In The East Irish Sea

Name	Capacity (MW)	Operator	Distance to other sea users local study area (km)
Operational			
Gwynt y Môr	576	Innogy	0.00
Burbo Bank Extension	259	Ørsted	0.50
North Hoyle	60	RWE npower renewables	3.90
Rhyl Flats	90	RWE Renewables	8.50
Burbo Bank	90	Ørsted	10.20
West of Duddon Sands	389	Ørsted	29.00
Barrow	90	Barrow Offshore Wind Ltd.	34.00
Walney Extension (3 and 4)	659	Ørsted	35.40
Walney 1	184	Walney (UK) Offshore Windfarms Ltd.	37.20
Walney 2	184	Walney (UK) Offshore Windfarms Ltd.	39.80
Ormonde	150	Ormonde Energy Ltd.	44.70
Round 4 projects			
Mona Offshore Wind Project	1,500	bp/EnBW	5.50
Morecambe Offshore Windfarm	480	Offshore Wind Ltd.	7.60
Morgan Offshore Wind Project	1,500	bp/EnBW	34.10
Proposed			
Awel y Môr	1,100	Innogy	0.00
Isle of Man Wind Farm	TBC	Ørsted	56.90

12.7.3.2 Cables

There are four power cables (not owned by the Applicant) which intersect the infrastructure and other sea users local study area (shown in Figure 12.4);

- Western HVDC link, operated by National Grid and Scottish Power.
- Gwynt y Môr offshore wind farm export cable, operated by Innogy.
- North Hoyle offshore wind farm export cable, operated by RWE npower renewables.
- Burbo Bank Extension offshore wind farm export cable, operated by Ørsted.

There are no pipelines not operated by the Applicant intersecting the infrastructure and other sea users local study area.

12.7.3.3 Oil and gas licence blocks

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 (NSTA). These licences are granted for identified geographical United Kingdom Hydrographic Office (UKHO) areas (blocks and sub-blocks) in consecutive rounds. As shown in Figure 12.5, five currently licensed blocks overlap with the infrastructure and other sea users local study area. These are blocks 110/13b, 11013a, 110/15a (all operated

by the Applicant) and blocks 110/14a and 110/14c (both operated by Chrysaor Resources (Irish Sea) Limited (part of Harbour Energy)).

It should be noted that on 07 October 2022 the NSTA launched the 33rd Oil and Gas Licensing Round, inviting applications for licences to explore and potentially develop 898 blocks and part-blocks, which may lead to over 100 licences being awarded. At the time of writing awards from this licensing round have not been announced as such are not considered further in this chapter.

12.7.3.4 Oil and gas platforms and pipelines

Figure 12.6 shows offshore oil and gas installations and pipelines in the vicinity of the Proposed Development. There are four platforms within the infrastructure and other sea users local study area:

- Douglas Process Platform, operated by the Applicant.
- Hamilton North Wellhead Platform, operated by the Applicant.
- Hamilton Main Wellhead Platform, operated by the Applicant.
- Lennox Wellhead Platform, operated by the Applicant.

The wellhead platforms are connected by existing pipelines that tie back to the Douglas Process Platform and then via the HyNet Offshore Cable Corridor to a natural gas processing plant at Point of Ayr.

12.7.4 Future baseline scenario

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 require that '*an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge*' is included within an ES. In the event that the Proposed Development does not come forward, an assessment of the future baseline conditions has been carried out and is described within this section.

The future baseline scenario for recreational activities is considered unlikely to change substantially from that presented in section 12.4, in the absence of the Proposed Development. The future baseline scenario for offshore cables and marine aggregates is subject to gradual change as new projects and sites are identified. The future baseline scenario for oil and gas activities and associated development (including platforms, wells, and pipelines) is considered to be subject to the greatest degree of change, which will depend upon currently unknown outcomes of, for example, acquisitions, exploration and development, and decommissioning.

12.7.5 Data limitations

The data sources used in this chapter are detailed in Table 12.3. The data used is the most up to date publicly available information which can be obtained from the applicable data sources as cited. The data is therefore limited by what is available and by what has been made available at the time of writing this chapter.

Given the level of activity in the east Irish Sea, it is considered that the data employed in the assessment is of a robust nature and is sufficient for the purposes of the impact assessment presented.

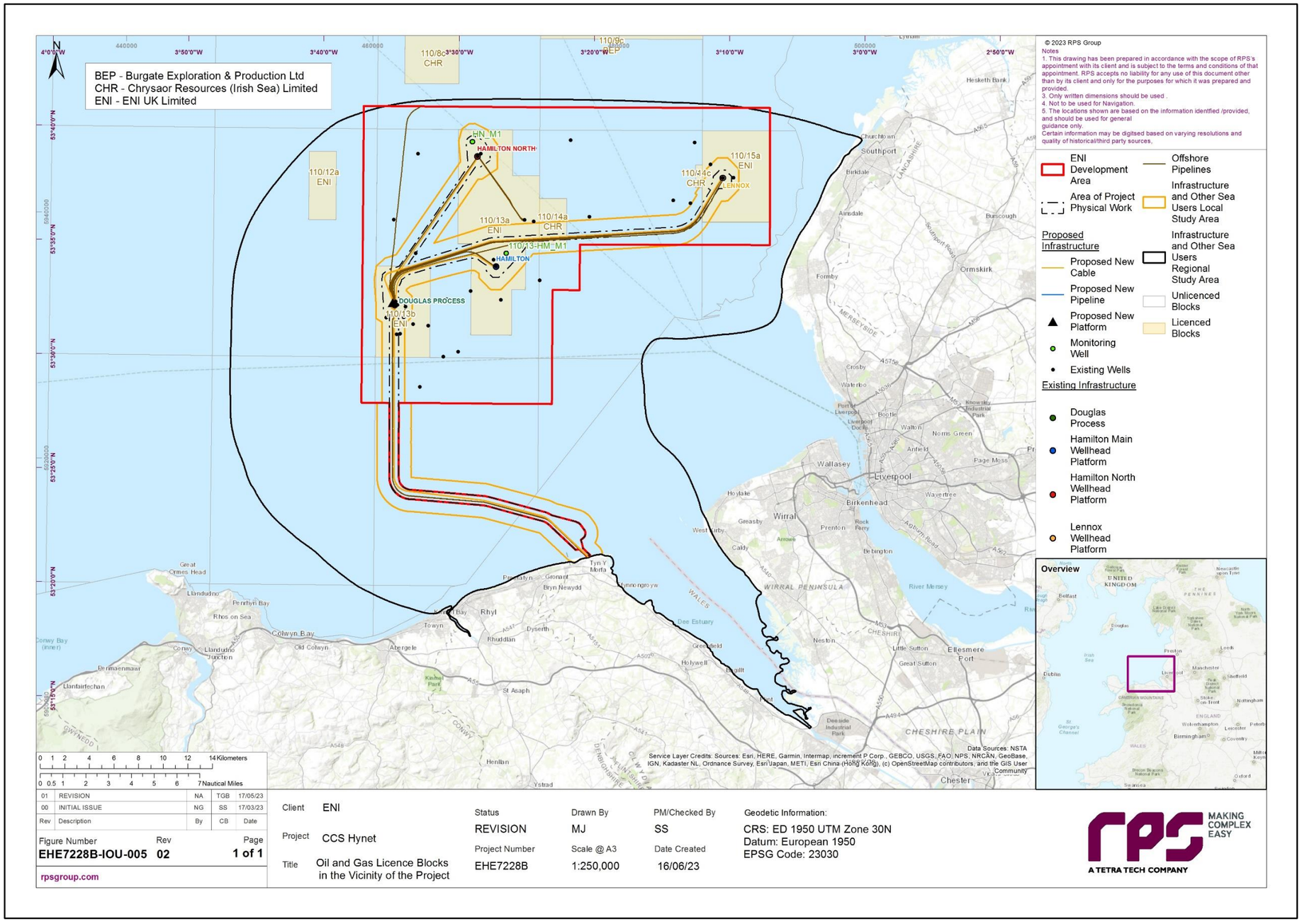

Figure 12.5: Oil And Gas Licence Blocks In The Vicinity Of The Proposed Development

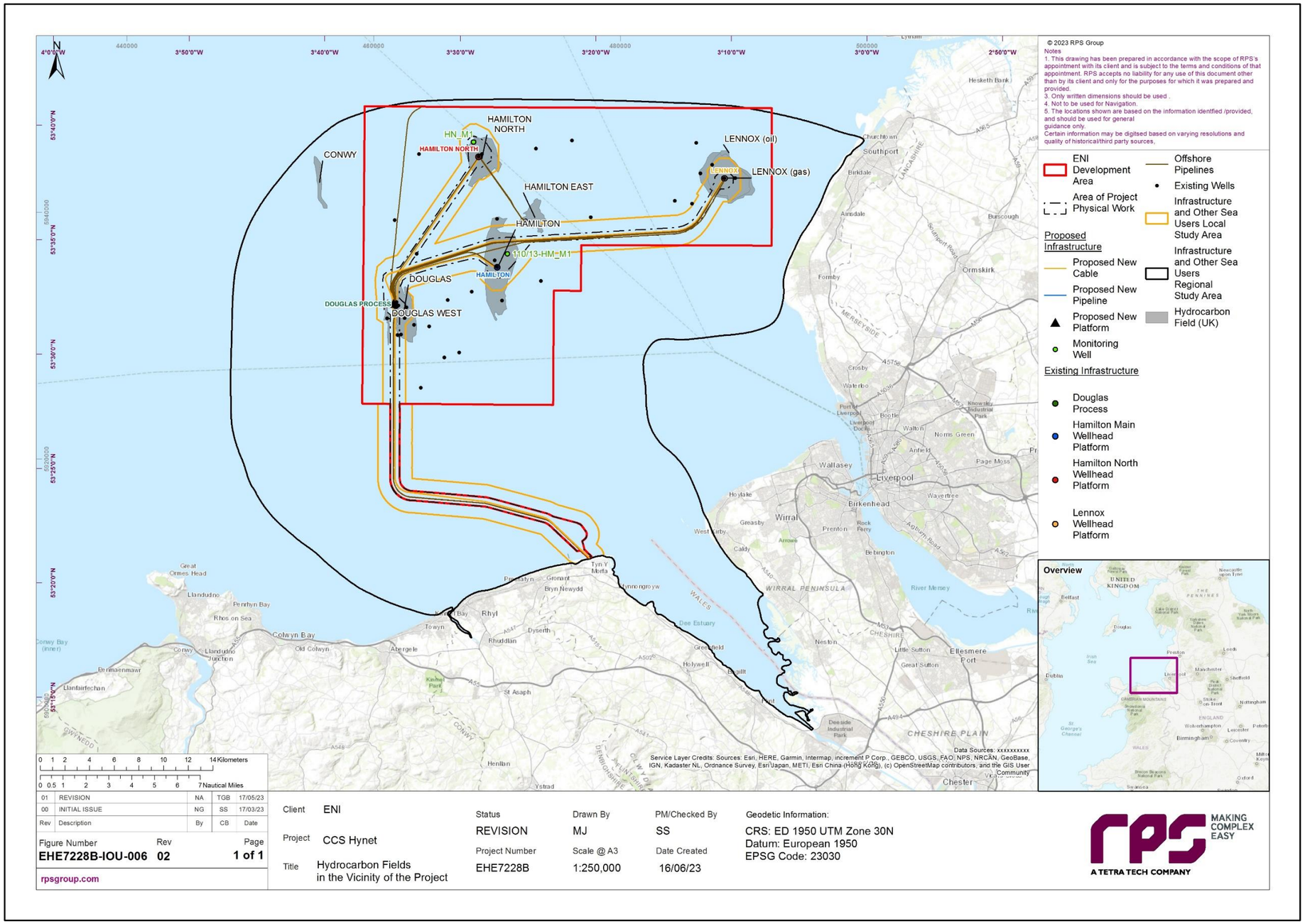

Figure 12.6: Offshore Oil And Gas Platforms, Installations, And Pipelines In The Vicinity Of The Proposed Development

12.8 Impact assessment methodology

12.8.1 Overview

The other sea users impact assessment has followed the methodology set out in volume 1, chapter 5. Specific to the other sea users impact assessment, the following guidance documents have also been considered:

- The Royal Yachting Association's (RYA) position on offshore renewable energy developments: Paper 1 (of 4) – Wind Energy, June 2019 (RYA, 2019).
- European Subsea Cables UK Association (ESCA) guideline no 6, the proximity of offshore renewable energy installations and submarine cable infrastructure in UK waters (ESCA, 2016).
- International Cable Protection Committee (ICPC) recommendations:
  - Recommendation No.2-11B: Cable routing and reporting criteria (ICPC, 2015).
  - Recommendation No.3-10C: Telecommunications cable and oil pipeline/power cables crossing criteria (ICPC, 2014).
- Pipeline crossing agreement and proximity agreement pack (Oil and Gas UK, 2021).
- Submarine cables and offshore renewable energy installations proximity study (TCE, 2012).

12.8.2 Impact assessment criteria

The criteria for determining the significance of effects is a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors. This section describes the criteria applied in this chapter to assign values to the magnitude of potential impacts and the sensitivity of the receptors. The terms used to define magnitude and sensitivity are based on those which are described in further detail in volume 2, chapter 5.

The criteria for defining magnitude in this chapter are outlined in Table 12.5 below.

Table 12.5: Definition Of Terms Relating To The Magnitude Of An Impact

Magnitude	Definition
High	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse)
	Large scale or major improvement or resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial)
Medium	Loss of resource, but not adversely affecting integrity of resource; partial loss of/damage to key characteristics, features or elements (Adverse)
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial)
Low	Some measurable change in attributes, quality or vulnerability, minor loss or, or alteration to, one (maybe more) key characteristics, features or elements (Adverse)
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial)
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse)
	Very minor benefit to, or positive addition of one or more characteristics, features or elements (Beneficial)
No change	No loss or alteration of characteristics, features or elements; no observable impact either adverse or beneficial

The criteria for defining sensitivity in this chapter are outlined in Table 12.6.

Table 12.6: Definition Of Terms Relating To The Sensitivity Of The Receptor

Sensitivity	Definition
Very High	High value/importance and vulnerability and limited potential for recoverability for recreational activities, cable/pipeline activities, aggregate extraction or oil and gas operations resulting from: • Very low spatial adaptability due to extent of operational range and/or limited ability to operate in other areas • Very low spatial tolerance due to dependence upon a limited number of sites • Very low recoverability with some ability to mitigate loss of area by operating in alternative areas.
High	High value/importance and vulnerability and limited potential for recoverability for recreational activities, cable/pipeline activities, aggregate extraction or oil and gas operations resulting from: • Low spatial adaptability due to extent of operational range and/or limited ability to operate in other areas • Low spatial tolerance due to dependence upon a limited number of sites • Low recoverability with some ability to mitigate loss of area by operating in alternative areas.
Medium	High or medium value/importance and vulnerability and moderate potential for recoverability for recreational activities, cable/pipeline activities, aggregate extraction or oil and gas operations resulting from: • Limited spatial adaptability due to extent of operational range and/or limited ability to operate in other areas • Limited spatial tolerance due to dependence upon a limited number of sites • Moderate recoverability with some ability to mitigate loss of area by operating in alternative areas.
Low	Low or medium value/importance and vulnerability and moderate potential for recoverability for recreational activities, cable/pipeline activities, aggregate extraction or oil and gas operations resulting from: • Moderate spatial adaptability due to extent of operational range and/or limited ability to operate in other areas • Moderate spatial tolerance due to dependence upon a limited number of sites • Moderate recoverability with some ability to mitigate loss of area by operating in alternative areas.
Negligible	Very low value/importance and vulnerability and high potential for recoverability for recreational activities, cable/pipeline activities, aggregate extraction or oil and gas operations resulting from: • High spatial adaptability due to extent of operational range and/or limited ability to operate in other areas • High spatial tolerance due to dependence upon a limited number of sites • High recoverability with some ability to mitigate loss of area by operating in alternative areas.

The significance of the effect upon other sea users is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The particular method employed for this assessment is presented in Table 12.7. Where a range of significance of effect is presented in Table 12.7, the final assessment for each effect is based upon expert judgement.

For the purposes of this assessment, any effects with a significance level of minor or less have been concluded to be not significant in terms of The Offshore Oil and Gas Exploration, Production, Unloading and Storage

(Environmental Impact Assessment) Regulations 2020, and The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)).

Table 12.7: Matrix Used For The Assessment Of The Significance Of The Effect

Sensitivity of Receptor	Magnitude of Impact				
	No Change	Negligible	Low	Medium	High
Negligible	No change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No change	Minor	Minor or Moderate	Moderate or Major	Major
Very High	No change	Minor	Moderate or Major	Major	Major

12.8.3 Maximum design scenario

The Maximum Design Scenarios (MDSs) identified in Table 12.8 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the Project Design Envelope (PDE) provided in volume 1, chapter 3. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the PDE (e.g. different infrastructure layout), to that assessed here be taken forward in the final design scheme.

Table 12.8: Maximum Design Scenario Considered For Each Impact As Part Of The Assessment Of Likely Significant Effects On Other Sea Users

[a] C=construction, O&M=operations and maintenance, D=decommissioning

Potential Impact	Phase[a]			Maximum Design Scenario	Justification
	C	O&M	D		
Displacement of recreational activities	✓	✓	✓	**Construction phase** • 2-year construction duration • During the construction phase the displacement of recreational activities will be gradual as the presence of infrastructure increases, reaching the MDS outlined below in the operations and maintenance phase. The MDS in terms of the presence of infrastructure would be on the completion of construction, during the operations and maintenance phase. • Construction safety zones: 500 m safety zones around the proposed new platform, topside updates and drilling of wells during their construction. 50 m safety zone around each infrastructure during the construction phase where no construction works are taking place on that infrastructure (for example, where a construction is incomplete or is in the process of being tested before commissioning). Rolling advisory safety zones of 500 m around vessels installing cables. • Construction vessels: Up to 195 installation vessel movements (return trips) during construction (10 tug/anchor handlers, 76 crew transfer vessels (CTVs), 9 cargo barges, 80 support vessels, 3 survey vessels, 2 pre-comm vessels, 1 seabed preparation vessel, 12 cable installation & support vessels, 2 cable protection and burial installation vessels). • Reduction of access around infrastructure during construction: – Platforms: up to one; – Terminal to Douglas cables: up to 68 km, up to 16 cable crossings; – Inter-Offshore Platform (OP) cables: up to 50 km, up to 10 cable crossings. **Operations and maintenance phase** • 25-year operations and maintenance duration • Operational safety zones: 500 m around during periods of major maintenance • Vessels: Up to a total of 4 operations and maintenance vessels on site at any one time (1 jack-up vessel, 3 other vessels). Up to 330 operations and maintenance vessel movements (return trips) each year (15 jack-up vessels, 300 helicopters, and 15 other vessels)	The greatest amount of the largest infrastructure and the greatest extent of advisory safety zones, over the longest construction, operations and maintenance, and decommissioning phases represents the greatest potential for displacement of recreational activities.

Potential Impact	Phase[a]			Maximum Design Scenario	Justification
	C	O&M	D		
				• Reduction of access in the infrastructure and other sea users local study area due to the presence of infrastructure, such as the proposed platform, as per the construction phase above and cable repair/reburial activities: – Terminal to Douglas cables: no cable repairs anticipated. General inspection works, including high resolution Multibeam Echosounder and Side Scan Sonar of entire cable length cable in one event every two years. Reburial of up to 500 m of cable in one event every 5-10 years. – Inter-OP cables: no cable repairs anticipated. General inspection works, including high resolution Multibeam Echosounder and Side Scan Sonar of entire cable length cable in one event every two years. Reburial of up to 500 m of cable in one event every 5-10 years. **Decommissioning phase** • During the decommissioning phase any displacement of recreational activities would gradually decrease from the operational MDS as structures are removed and/or cut below the seabed.	
Increased SSCs and associated deposition affecting recreational diving and bathing sites	✓	✓	✓	**Construction phase** • 2-year construction duration. <u>Site preparation:</u> • Sand wave clearance activities undertaken over an approximate up to three weeks duration within the wider 2-year construction programme. • Platform foundations: It will be necessary to carry out some pre-lay seabed preparation through this location. The dunes are up to 3 m in height, and a corridor approximately 115 m length, 10 m in width would be created through them. This equates to a total spoil volume of 3,450 m^3 for this location. • West Hoyle Bank: It will be necessary to carry out some pre-lay seabed preparation through this location, which will likely be using mass flow excavator or possibly a jet sled. The dunes are up to 7 m in height, and a corridor approximately 1,000 m length, 21 m in width would be created through them. This equates to a total spoil volume of 147,000 m^3 for this location. <u>Cable installation:</u> • Terminal-Douglas cables: Installation via trenching of up to 68 km of cable, with a trench width of up to 1.5 m and a depth of up to 3 m. Total disturbed area of	<u>Site preparation:</u> The volume of material to be cleared from individual sand waves will vary according to the local dimensions of the sand wave (height, length and shape) and the level to which the sand wave must be reduced. These details are not fully known at this stage, however based on the available data, it is anticipated that the sand waves requiring clearance in the other sea users regional study area are likely to be in the range of 3m in height. Site clearance activities may be undertaken using a range of techniques. The suction hopper dredger will result in the greatest increase in suspended sediment and largest plume extent as

Potential Impact	Phase[a]			Maximum Design Scenario	Justification
	C	O&M	D		
				102,000 m^2. Installed over a period of approximately 22 days in total (11 days per cable), assuming a cable burial rate of 3,000 m/day via ploughing. • Inter-OP cables: Installation via trenching of up to 50 km of cable, with a trench width of up to 1.5 m and a depth of up to 3 m. Total disturbed area of 75,000 m^2. Installed over a period of approximately 17 days in total (approximately 6 days per cable), assuming a cable burial rate of 3,000 m/day via ploughing. <u>Drilling wells:</u> • Well site 1: Hamilton North HN_M3: Total spoil volume of 136.65 m^3 will be released approximately 1 m above the seabed. • Well site 2: Lennox LX-M2_12: Total spoil volume of 136.65 m^3 will be released approximately 1 m above the seabed. **Operations and maintenance phase** • 25-year operations and maintenance duration • Terminal-Douglas cables: no cable repairs anticipated. General inspection works, including high resolution Multibeam Echosounder and Side Scan Sonar of entire cable length cable in one event every two years. Reburial of up to 500 m of cable in one event every 5-10 years. • Inter-OP cables: no cable repairs anticipated. General inspection works, including high resolution Multibeam Echosounder and Side Scan Sonar of entire cable length cable in one event every two years. Reburial of up to 500 m of cable in one event every 5-10 years. **Decommissioning phase** • Removal of foundations (suction bucket): SSC will be temporarily increased due to the overpressure required to release them.	material is released near the water surface during the disposal of material. Boulder clearance activities will result in minimal increases in SSC and have therefore not been considered in the assessment. <u>Cable installation:</u> Cable routes inevitably include a variety of seabed material and in some areas 3 m depth may not be achieved or may be of a coarser nature which settles in the vicinity of the cable route. The assessment therefore considers the upper bound in terms of suspended sediment and dispersion potential. Cables will be buried by ploughing. The use of open trenching in the intertidal area releases the greatest volume of material into the water column and therefore provides the upper bound of impacts as compared with horizontal directional drilling (HDD) installation. <u>Operations and maintenance phase:</u> The greatest foreseeable number of cable reburial and repair events is considered to be the MDS for sediment dispersion.
Impacts to existing cables or pipelines or restrictions on access to cables or pipelines	✓	✓	✓	As for 'Displacement of recreational activities' – see above.	This represents the maximum extent of infrastructure and associated construction and

Potential Impact	Phase[a]			Maximum Design Scenario	Justification
	C	O&M	D		
					maintenance activities in the vicinity of existing cables or pipelines.
Increased SSCs and associated deposition affecting aggregate extraction areas	✓	✓	✓	As for 'Increased SSCs and associated deposition affecting recreational diving sites' – see above.	Greatest volume of sediment released into the water column, resulting in greatest potential for impact on aggregate extraction receptors. See 'Increased SSCs and associated deposition affecting recreational diving and bathing sites' above.
Reduction or restriction of oil and gas exploration activities (including surveys, drilling and the placement of infrastructure)	✓	✓	✓	As for 'Displacement of recreational activities' – see above.	The greatest amount of the largest infrastructure and associated minimum spacing and the greatest extent of advisory safety zones, over the longest construction, operations and maintenance, and decommissioning period represents the greatest potential for reduction or restriction of oil and gas exploration activities.

12.9 Impacts scoped out of the assessment

On the basis of the baseline environment and the description of development outlined in volume 1, chapter 3 and volume 2, chapter 6, alterations to sediment transport pathways affecting aggregate extraction areas impacts are proposed to be scoped out of the assessment for infrastructure and other sea users. Platform structures (within the water column) consist of four legs circa 2 m in diameter at a spacing of 17 m. It assumed that, given the sandy nature of the seabed, suitable scour protection will be provided to avoid scour holes developing. Given the diminutive nature of the structure, in comparison to, say a neighbouring wind turbine structure for which suitable published information is available, the impacts on sediment transport pathways would be diminutive and as such are scoped out of the assessment.

12.10 Embedded mitigation

A number of measures (primary and tertiary) have been adopted as part of the Proposed Development to reduce the potential for impacts on infrastructure and other sea users. These are outlined in Table 12.9 below. As there is a secured commitment to implementing these measures for the Proposed Development, they have been considered in the assessment presented in section 12.11 below (i.e. the determination of magnitude and therefore significance assumes implementation of these measures).

Table 12.9: Measures Adopted As Part Of The Proposed Development

Mitigation measures adopted as part of the Proposed Development	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Application for safety zones of up to 500m during construction.	The Proposed Development intends to apply for a standard 500 m safety zone (as per the 2007 Safety Zone regulations cited in the justification column), around the proposed new platform whilst construction/decommissioning works are ongoing. Safety zones of 50 m will be sought for incomplete structures where construction/decommissioning activity may be temporarily paused (and therefore the 500 m safety zone has lapsed). Details of safety zones will also be set out within the emergency response and cooperation plan. Safety zones are established in the interests of safety to infrastructure and other sea users receptors, in accordance with Section 22 of the Petroleum Act 1987, and The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007.	Proposed to be secured within the marine licence, and Carbon Storage Permit.
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Where the Proposed Development cables/ pipelines will be required to cross an active cable, it is intended that a commercial 'crossing agreement' will be entered into with the cable operator. A crossing agreement based upon the ICPC Recommendation 3-10C 'Telecommunications Cable and Oil	This is a formal arrangement that establishes the responsibilities and obligations of both parties and allows operations to be managed safely and to reduce potential conflict at cable crossing locations. This is a formal arrangement that establishes the responsibilities and	In line with standard industry practice crossing agreements would be negotiated and agreed with operators as required.

Mitigation measures adopted as part of the Proposed Development	Justification	How the measure will be secured
Pipeline/Power Cables Crossing Criteria' (ICPC, 2014) will be used for any cable crossings. Where a cable is inactive, the Applicant will consult with the cable operator to ascertain if such a crossing agreement is required.	obligations of both parties and allows operations to be managed safely.	
Promulgation of information advising on the nature, timing and location of activities, including through Notices to Mariners.	To ensure other marine users are aware of operations associated with the Proposed Development.	Secured within a Marine Licence condition.
Development of and adherence to a Navigational Safety Plan (NSP). The NSP will describe measures put in place by the Project related to navigational safety, including information on Safety Zones, charting, construction buoyage, temporary lighting and marking, and means of notification of Project activity to other sea users (e.g., via Notice to Mariners).	To ensure other marine users are aware of operations and infrastructure associated with the Proposed Development.	Proposed to be secured within the marine licence.
Consultation with oil and gas operators and other energy infrastructure operators to promote and maximise cooperation between parties and minimise both spatial and temporal interactions between conflicting activities.	Licence blocks will be relinquished and acquired by different operators over the duration of the project life, and oil and gas operations will change according to the project phase. By continued consultation with the oil and gas operators both parties will keep informed of planned activities in order to minimise disruption to either party's operations and to maximise coexistence.	In line with standard industry practice.
Development and adherence to a Cable Specification and Installation Plan (CSIP) post consent which will include cable burial where possible (in accordance with the specific policies set out in the North West Inshore and North West Offshore Coast Marine Plans (MMO, 2021)) and cable protection, as necessary.	There is a potential for cable exposure to occur due to interactions between Metocean regime (wave, sand and currents). The sediment transport can lead to exposure of cables and infrastructure, the use of a cable burial depth alongside the cable installation strategy should provide sufficient depth to avoid exposure.	The CSIP will be conditioned in the Marine Licence.
Development and adherence to a pipeline Specification and Installation Plan which will include pipeline burial where possible and pipeline protection as necessary.	To ensure that the pipeline remains secure, is not a hazard to other sea users and does not risk becoming exposed and damaged by tidal currents.	In line with standard industry practice.
Installation of infrastructure over or adjacent to existing cables or pipelines will be subject to crossing or proximity agreements between the two parties, prior to the start of the construction phase.	To reduce potential conflict at crossing locations. Cable and pipeline crossing/proximity agreements will be based on previously referenced guidance from the ICPC and Oil and Gas UK.	In line with standard industry practice crossing/proximity agreements would be negotiated and agreed with operators as required.
Application for safety zones of up to 500m during periods of major maintenance.	Details of safety zones will also be set out within the emergency response and cooperation plan. Safety zones are established in the interests of safety to infrastructure and other sea users receptors, in accordance with Section 22 of the Petroleum Act 1987, and The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007	Proposed to be secured within the marine licence, and Carbon Storage Permit.

12.11 Assessment of significance

12.11.1 Overview

The impacts of the construction, operations and maintenance, and decommissioning phases of the Proposed Development have been assessed on infrastructure and other sea users. The potential impacts arising from the construction, operations and maintenance, and decommissioning phases of the Proposed Development are listed in Table 12.8, along with the MDS against which each impact has been assessed.

A description of the potential effect on other sea users receptors caused by each identified impact is given below.

12.11.2 Displacement of recreational activities

Construction, operations and maintenance, and decommissioning of the Proposed Development may lead to the displacement of recreational activities such as sailing and motor cruising, recreational fishing and inshore water sports. The MDS is represented by the greatest amount of the largest infrastructure and associated greatest extent of advisory safety zones, over the longest construction and decommissioning phases. This is summarised in Table 12.8.

12.11.2.1 Construction phase

Magnitude of impact

The installation of infrastructure and the presence of safety zones may result in the displacement of recreational activities from the Proposed Development.

The Proposed Development has a construction phase of up to 2 years. The spatial extent of the infrastructure and other sea users local study area is 205.0 km^2. There is also potential for safety zones to extend 500 m beyond this area. The impact of safety zones is mostly reversible as once each structure has been installed and commissioned these will be removed. The infrastructure and other sea users local study area extends to the shoreline and therefore frequency of impact within is low. Up to 195 installation vessel movements will be required during construction, with 500 m rolling advisory safety zones around cable installation vessels.

There is low to medium recreational vessel activity in the nearshore area of the infrastructure and other sea users local study area, with a general boating area and water sports clubs in the vicinity. There is the potential for temporary loss of recreational resource during nearshore/inshore cable installation activities.

Underwater sound associated with the construction of the Proposed Development has the potential to affect fish and shellfish, which subsequently has the potential to impact upon recreational fishing. Further information on underwater sound is presented in volume 3, appendix J: Underwater Noise Technical Report. Potential impacts on fish and shellfish behaviour associated with underwater sound have been assessed as minor adverse in volume 2, chapter 7.

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

Sensitivity of receptor

Recreational vessels are able to alter their route, dependent on the target destination. Notices to Mariners will be promulgated regularly during the construction phase, advising of the location and nature of construction works, and information and notices will be posted at the landfall location, ensuring that recreational activities can be planned accordingly.

The receptor is deemed to be of low vulnerability, high recoverability and moderate value. The sensitivity of the receptor is therefore, considered to be **negligible**.

Significance of the effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **low** and the magnitude is deemed to be **negligible**. As set out in Table 12.7, the effect will therefore be of **negligible adverse** significance, which is not significant in EIA terms.

12.11.2.2 Operations and maintenance phase

Magnitude of impact

The presence of infrastructure, including the proposed platform, may result in the displacement of recreational craft and recreational fishing vessels from the infrastructure and other sea users local study area.

The Proposed Development has an operations and maintenance phase of up to 25 years. 500 m safety zones will be established around infrastructure such as the proposed platform during periods of major maintenance. Up to 330 operations and maintenance vessel movements may be required each year. As stated in the description of the magnitude of this impact during the construction phase, frequency of impact within the infrastructure and other sea users local study area is low. Recreational vessels will be able to access and transit through the infrastructure and other sea users local study area, so displacement due to the presence of infrastructure will not occur.

As previously stated, there is low to medium recreational vessel activity in the nearshore area of the infrastructure and other sea users local study area (Figure 12.3) and a general boating area and water sports clubs along the shoreline within the infrastructure and other sea users regional study area. During the operations and maintenance phase, no cable repairs are anticipated, as the cable will be buried, and installed as a single, unjointed length offshore. Where the cable cannot be buried e.g. at crossings, it will have external cable protection. General inspection works will be carried out, including high resolution Multibeam Echosounder and Side Scan Sonar of entire cable length cable in one event every two years. From experience of existing operations, reburial of up to 500 m of cable in one event every 5-10 years is anticipated. For the Terminal-Douglas cables, a similar inspection programme is anticipated.

The impact is predicted to be of local spatial extent, long term duration, continuous and irreversible over the 25-year operations and maintenance phase of the Proposed Development. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **low**.

Sensitivity of receptor

Recreational vessels are able to alter their route, dependent on the target destination. Notices to Mariners will be promulgated regularly during the operations and maintenance phase, advising of the location and nature of major maintenance works, and information and notices will be posted at the landfall location, ensuring that recreational activities can be planned accordingly.

The receptor is deemed to be of low vulnerability, high recoverability and moderate value. The sensitivity of the receptor is therefore, considered to be **negligible**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **low** the magnitude is deemed to be negligible. As set out in Table 12.7, the effect will therefore be of **negligible adverse** significance, which is not significant.

12.11.2.3 Decommissioning phase

The effects of decommissioning activities are expected to be the same or similar to the effects from construction. As set out in Table 12.7, the effect will therefore be of **negligible adverse** significance, which is not significant. The effect has been defined as minor rather than negligible as there will still be a perceptible effect, although it is unlikely to be critical in the decision-making process.

12.11.3 Increased SSCs and associated deposition affecting recreational diving and bathing sites

Construction, operations and maintenance, and decommissioning of the platform, wells, pipelines and cables have the potential to increase SSCs, affecting recreational diving and bathing sites. The MDS is represented by the maximum volume of sediment disturbed and is summarised in Table 12.8.

12.11.3.1 Construction phase

Magnitude of impact

Volume 2, chapter 6 considers potential elevations in SSC and deposition to the seabed as a result of a number of activities proposed to occur within the other sea users regional study area. More specifically these activities are:

- Well drilling and cementing.
- Cable/pipeline installation via trenching.
- Cable/pipeline removal and reburial.

Drilling wells will include:

- Well site 1: Hamilton North HN_M3: Total spoil volume of 136.65 m^3 will be released approximately 1 m above the seabed.
- Well site 2: Lennox LX-M2_12: Total spoil volume of 136.65 m^3 will be released approximately 1 m above the seabed.

Cable installation will include:

- Up to 3 weeks of installing inter-PC cables via trenching will create a total spoil volume of 3,450 m^3
- Up to 3 weeks of installing the Terminal-Douglas cables via trenching will create a total spoil volume of 147,000 m^3.

There is potential that sediment plumes from resuspended sediment could impact recreational areas through changes to water quality. Recreational areas would only be affected if the amount of fine sediments suspended in the water or settling in the area are significantly above any background levels or contain any contaminants which would not usually be expected in the area. However, in volume 2, chapter 6 it is anticipated that any deposited fine sediments would be subject to redistribution under the prevailing coastal processes.

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

Sensitivity of receptor

There are six identified recreational diving sites within the infrastructure and other sea users regional study area. Nine recreational bathing sites (Southport, Ainsdale, Formby, West Kirby, Prestatyn, Rhyl, Rhyl East, Marine Lake (Rhyl) and Kinmel Bay (Sandy Cove)) are also within the infrastructure and other sea users regional study area. These sites may be impacted by an increase in SSCs in the short term, although as stated it is anticipated that any deposited fine sediments would be subject to redistribution under the prevailing coastal processes. Figure 12.3 shows other recreational diving and bathing sites in the east Irish Sea region which may provide alternative sites during operations resulting in SSCs, however sea conditions and water depth for accessibility may prevent this.

Notices to Mariners will be promulgated regularly during the construction phase, advising of the location and nature of construction works, and information and notices will be posted at the landfall location, ensuring that recreational activities can be planned accordingly.

The receptor is deemed to be of moderate vulnerability, moderate recoverability, and low value. The sensitivity of the receptor is therefore, considered to be **low**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be low and the magnitude is deemed to be low. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is **not significant**.

12.11.3.2 Operations and maintenance phase

Magnitude of impact

The Proposed Development has an operations and maintenance phase of 25 years. During the operations and maintenance phase, the greatest foreseeable number of cable reburial and repair events is considered to be the MDS for sediment dispersion.

From Table 12.8, during these 25 years, experience from existing operations indicates, there would be an average reburial of up to 500 m of cable in one event every 5-10 years. No cable repairs are anticipated, as the cable will be buried, and installed as a single, unjointed length offshore. Where the cable cannot be buried e.g. at crossings, it will have external cable protection. This makes it unlikely that there would be regular or significant disturbance to the recreational the dive site located within the infrastructure and other sea users local study area. It is anticipated that any deposited fine sediments would be subject to redistribution under the prevailing coastal processes.

The impact is predicted to be of local spatial extent, short term duration, intermittent and reversible. The magnitude is therefore, considered to be **negligible**.

Sensitivity of receptor

Six identified recreational diving sites and nine recreational bathing sites (Southport, Ainsdale, Formby, West Kirby, Prestatyn, Rhyl, Rhyl East, Marine Lake (Rhyl) and Kinmel Bay (Sandy Cove)) are within the are within the infrastructure and other sea users regional study area. These sites may be impacted by an increase in SSCs in the short term, although as stated it is anticipated that any deposited fine sediments would be subject to redistribution under the prevailing coastal processes. Figure 12.3 shows other recreational diving and bathing sites in the east Irish Sea region which may provide alternative sites during operations resulting in SSCs, however sea conditions and water depth for accessibility may prevent this.

Notices to Mariners will be promulgated regularly during the operations and maintenance phase, advising of the location and nature of major maintenance works, and information and notices will be posted at the landfall location, ensuring that recreational activities can be planned accordingly.

The receptor is deemed to be of moderate vulnerability, moderate recoverability and low value. The sensitivity of the receptor is therefore considered to be **low**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **low** and the magnitude is deemed to be **negligible**. As set out in Table 12.7, the effect will therefore be of **negligible adverse** significance, which is not significant. The effect has been defined as **negligible**, rather than minor, because any effect will be beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

12.11.3.3 Decommissioning phase

The effects of decommissioning activities are expected to be the same or similar to the effects from construction. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is not

significant. The effect has been defined as **minor**, rather than negligible, as there will still be a perceptible effect, although it is unlikely to be critical in the decision-making process.

12.11.4 Impacts to existing cables or pipelines or restrictions on access to cables or pipelines

Construction, operations and maintenance, and decommissioning of the platform, pipelines, wells and cables may lead to impacts on existing cables and pipelines, or restrictions on access to cables and pipelines. The MDS is represented by the greatest amount of the largest infrastructure and associated minimum spacing and the greatest extent of safety zones, over the longest construction, operations and maintenance, and decommissioning phases. This is summarised in Table 12.8.

12.11.4.1 Construction phase

Magnitude of impact

The Proposed Development has a construction phase of up to two years. The spatial extent of the other sea users local study area has an area of 205.0 km^2. There is also potential for safety zones to extend 500 m beyond this area. The impact of safety zones is mostly reversible as once each structure has been installed and commissioned these will be removed.

Up to 195 installation vessel movements will be required during construction, with 500 m rolling advisory safety zones around cable installation vessels. As stated in Figure 12.4, four active cables intersect the infrastructure and other sea users local study area. No pipelines overlap with the infrastructure and other sea users local study area.

Infrastructure, safety zones and activities associated with the Proposed Development may restrict access to the existing cables mentioned above, in addition to the planned MaresConnect cable. Cable crossing and proximity agreements as per the ICPC Recommendation 3-10C ‘Telecommunications Cable and Oil Pipeline/Power Cables Crossing Criteria’ will be established with relevant cable operators and will include the ability of a cable operator to access their infrastructure during the construction of the Proposed Development as far as practical.

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

Sensitivity of receptor

Restriction of access to an active cable for inspection and maintenance activities could be critical to the operator of that cable. However, crossing and proximity agreements are common across the UKCS and there are established mechanisms for controlling the level of impact to both parties, in the form of the ICPC Recommendation 3-10C guidance. No active pipelines other than those operated by the Applicant exist within the infrastructure and other sea users local study area.

The receptor is deemed to be of moderate vulnerability, moderate recoverability and high value. The sensitivity of the receptor is therefore, considered to be **medium**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **medium** and the magnitude is deemed to be **low**. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is **not significant**.

12.11.4.2 Operations and maintenance phase

Magnitude of impact

As described earlier, there are four power cables which intersect the infrastructure and other sea users local study area. Infrastructure, safety zones and activities associated with the Proposed Development may restrict access to these existing cables.

Loss of access to cables associated with any temporary safety zones during the operations and maintenance phase is considered to be limited in extent and infrequent. Loss of access to cables associated with the presence of structures would be considered in the crossing/proximity agreements to the extent that such a scenario would not be an impediment to operations.

Crossing and proximity agreements will be established with relevant cable operators, to minimise the potential for any impact in accordance with recognised industry best practice. These agreements will ensure close communication and planning between both parties to ensure disruption of activities is minimised.

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

Sensitivity of receptor

Major maintenance activities associated with the Proposed Development will be publicised via Notices to Mariners. The terms of the crossing and proximity agreements will ensure communication between both parties and that loss of access is minimised.

Restriction of access to an active cable for inspection and maintenance activities could be critical to the operator of that cable. However, crossing and proximity agreements are common across the UKCS and there are established mechanisms for controlling the level of impact to both parties in the form of the guidance.

The receptor is deemed to be of moderate vulnerability, moderate recoverability and high value. The sensitivity of the receptor is therefore, considered to be **medium**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **medium** and the magnitude is deemed to be **low**. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is **not significant**.

12.11.4.3 Decommissioning phase

The effects of decommissioning activities are expected to be the same or similar to the effects from construction. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is **not significant**.

12.11.5 Increased SSCs and associated deposition affecting aggregate extraction and deposit areas

Construction, operations and maintenance, and decommissioning of the platform, pipelines, wells and cables have the potential to increase SSCs, affecting aggregate extraction areas. The MDS is represented by the maximum volume of sediment disturbed and is summarised in Table 12.8.

12.11.5.1 Construction phase

Magnitude of impact

Volume 2, chapter 6 considers potential elevations in SSC and deposition to the seabed as a result of a number of activities proposed to occur within the infrastructure and other sea users regional study area. More specifically these activities are:

- Well drilling and cementing.
- Cable/pipeline installation via trenching.
- Cable/pipeline removal and reburial.

Drilling wells will include:

- Well site 1: Hamilton North HN_M3: Total spoil volume of 136.65 m^3 will be released approximately one m above the seabed.
- Well site 2: Lennox LX-M2_12: Total spoil volume of 136.65 m^3 will be released approximately one m above the seabed.

Cable installation will include:

- Up to 3 weeks of installing inter-PC cables via trenching will create a total spoil volume of 3,450 m^3.
- Up to 3 weeks of installing the Terminal-Douglas cables via trenching will create a total spoil volume of 147,000 m^3.

In terms of drilled materials within the infrastructure and other sea users regional study area, the volumes of material being displaced and deposited locally are relatively limited (136.65 m^3 within Liverpool Bay Area 457 marine aggregate extraction site and 136.65 m^3 within Site Y marine aggregate disposal site). This also limits the thickness of any resulting deposition. Any such deposition would also be expected to be localised and as such would have limited interact with the aggregate extraction and deposition areas.

For sand wave clearance prior to cable installation, the majority of sediment would be deposited locally. Finer grained material may enter into suspension and be advected away from the point of release up to distances of several tens of kilometres. However, concentrations would be very low and within natural variability. Deposition of sediments to a thickness that is measurable is likely to remain limited.

In terms of cable installation within the infrastructure and other sea users regional study area, the volumes of material being displaced and deposited locally are relatively limited (A total disturbed area of 1,020 m^2 for the Terminal – Douglas cables and 750 m^2 for the Inter-OP cables). Of this volume, it is estimated that 0.0825 km^2 will directly impact the Liverpool Bay Area 457 marine aggregate extraction site (based upon Inter-OP cables traversing the site for 5.5 km) and 0.0825 km^2 will directly impact the Site Y marine aggregate disposal site (based upon Inter-OP cables traversing the site for 5.5 km).

The cable laying method also limits the thickness of any resulting deposition; the plough 'slices' a trench approximately 1-1.5 m in width, while simultaneously burying the cable. Any deposition from this process would also be expected to be localised and as such would not be expected to interact with the aggregate extraction areas in a significant way.

As well as the impact related to the above activities overlapping the aggregate extraction and deposit areas, there is also potential that sediment plumes from resuspended sediment could impact the extraction and deposit areas within the infrastructure and other sea users regional study area through sedimentation and the potential that this could affect the quality of aggregate (coarse sand deposits). Aggregate would only be affected if the amount the sediment fines that are settling in the area are significantly above any background levels or contain any contaminants which would not usually be expected in the aggregate area. There is no evidence of fine-grained sand within the Liverpool Bay 457 and Hilbre Swash 393 dredging areas, although it seems likely that it does pass through it. This indicates that present-day tidal currents and waves are capable

of carrying fine grained sand across the area (Sefton Council executive report, 2007). Therefore, given this characteristic and the overlap with the infrastructure and other sea users regional study area, a small proportion of the total spoil volume could settle within Liverpool Bay 457 and Hilbre Swash 393. It is also anticipated that any deposited fine sediments would be subject to redistribution under the prevailing coastal processes.

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

Sensitivity of receptor

Westminster Gravels Ltd dredge coarse sand deposits from the Liverpool Bay 457 dredging area and Mersey Sand Suppliers dredge coarse sand deposits from Hilbre Swash 393, a resource of value to the regional economy. Dredging operators are adaptable as they are able, to some extent, to screen out unwanted fine sediment load. Furthermore, it is known that the existing tidal currents and waves are capable of carrying fine grained sand across the area (Sefton Council executive report, 2007).

The receptor is deemed to be of low vulnerability, moderate recoverability and moderate value. The sensitivity of the receptor is therefore, considered to be **medium**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **medium** and the magnitude is deemed to be **low**. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is **not significant**.

12.11.5.2 Operations and maintenance phase

Magnitude of impact

The Proposed Development has an operations and maintenance phase of 25 years. During the operations and maintenance phase, the greatest foreseeable number of cable reburial and repair events is considered to be the MDS for sediment dispersion.

Table 12.8 states that over the operations and maintenance phase, experience from existing operations indicates, there would be an average reburial of up to 500 m of cable in one event every 5-10 years. No cable repairs are anticipated, as the cable will be buried, and installed as a single, unjointed length offshore. Where the cable cannot be buried e.g. at crossings, it will have external cable protection. It is anticipated that any deposited fine sediments would be subject to redistribution under the prevailing coastal processes. Liverpool Bay 457 and Hilbre Swash 393 dredging areas are located across 5.5 km stretches of the Inter-OP cable routes respectively and thus where reburial may occur. There is also potential that sediment plumes from reburial activities elsewhere along cable lengths could resuspend sediment that could impact the aggregate extraction areas within the infrastructure and other sea users regional study area through sedimentation and the potential that this could affect the quality of aggregate (coarse sand deposits). Aggregate would only be affected if the amount the sediment fines that are settling in the area are significantly above any background levels or contain any contaminants which would not usually be expected in the aggregate area. There is no evidence of fine-grained sand within the Liverpool Bay 457 and Hilbre Swash 393 dredging areas, although it seems likely that it does pass through it. This indicates that present-day tidal currents and waves are capable of carrying fine grained sand across the area (Sefton Council executive report, 2007). Therefore, given this characteristic and the overlap with the infrastructure and other sea users regional study area, a small proportion of the total spoil volume could settle within Liverpool Bay 457 and Hilbre Swash 393. It is also anticipated that any deposited fine sediments would be subject to redistribution under the prevailing coastal processes.

The impact is predicted to be of local spatial extent, short term duration, intermittent and reversible. The magnitude is therefore, considered to be **negligible**.

Sensitivity of receptor

Westminster Gravels Ltd dredge coarse sand deposits from the Liverpool Bay 457 dredging area and Mersey Sand Suppliers dredge coarse sand deposits from Hilbre Swash 393, a resource of value to the regional economy. Dredging operators are adaptable as they are able, to some extent, to screen out unwanted fine sediment load. Furthermore, it is known that the existing tidal currents and waves are capable of carrying fine grained sand across the area (Sefton Council executive report, 2007).

The receptor is deemed to be of low vulnerability, moderate recoverability and moderate value. The sensitivity of the receptor is therefore, considered to be **medium**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **medium** and the magnitude is deemed to be **negligible**. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is not significant. The effect has been defined as minor rather than negligible as there will still be a perceptible effect, although it is unlikely to be critical in the decision-making process.

12.11.5.3 Decommissioning phase

The effects of decommissioning activities are expected to be the same or similar to the effects from construction. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is **not significant**.

12.11.6 Reduction or restriction of oil and gas exploration activities (including surveys, drilling and the placement of infrastructure)

Construction, operations and maintenance, and decommissioning of the platform, pipelines, wells and cables may lead to impacts and restrictions on oil and gas activities within the other sea users local study area. The MDS is represented by the greatest amount of the largest infrastructure and the greatest extent of safety zones, over the longest construction, operations and maintenance and decommissioning phases. This is summarised in Table 12.8.

12.11.6.1 Construction phase

Magnitude of impact

The Proposed Development has a construction phase of up to two years. The spatial extent of the other sea users local study area is 205.0 km^2, which is not large in the context of the east Irish Sea. There is also potential for safety zones to extend 500 m beyond this area. The impact of safety zones is mostly reversible as once each structure has been installed and commissioned these will be removed. Therefore, frequency of impact within the other sea users local study area is low.

Up to 195 installation vessel movements will be required during construction, with 500 m rolling advisory safety zones around cable installation vessels. One platform will be installed.

As infrastructure is installed, the area available for seismic surveys and drilling will be restricted, and the presence of safety zones around infrastructure and vessels may also further restrict the ability to use certain alternative survey methods.

The impact is predicted to be of local spatial extent, long term duration, high frequency and reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **medium**.

Sensitivity of receptor

As shown in Figure 12.5, there are five currently licensed blocks overlapping with the infrastructure and other sea users local study area. These are blocks 110/13b, 11013a, 110/15a (all operated by the Applicant) and

blocks 110/14a and 110/14c (both operated by Chrysaor Resources (Irish Sea) Limited (part of Harbour Energy)). There is also potential for blocks to become licenced in future (i.e. through Oil and Gas Licensing Rounds), but the assessment of this potential impact is complicated by a degree of uncertainty.

The receptor is deemed to be of negligible vulnerability, moderate recoverability and low value. The sensitivity of the receptor is therefore, considered to be **negligible**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **negligible** and the magnitude is deemed to be **medium**. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is **not significant**. The effect has been defined as **minor**, rather than negligible, as there will still be a perceptible effect, although it is unlikely to be critical in the decision-making process.

12.11.6.2 Operations and maintenance phase

Magnitude of impact

The Proposed Development has an operations and maintenance phase of up to 25 years. 500 m safety zones will be established around infrastructure such as the proposed platform during periods of major maintenance. Up to 330 operations and maintenance vessel movements may be required each year, with up to four vessels on site at any one time.

Due to these vessel movements, the presence of this infrastructure and the safety zones, the area available for seismic surveys, alternative surveys and drilling will be restricted.

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

Sensitivity of receptor

As shown in Figure 12.5, there are five currently licensed blocks overlapping with the infrastructure and other sea users local study area. These are blocks 110/13b, 11013a, 110/15a (all operated by the Applicant) and blocks 110/14a and 110/14c (both operated by Chrysaor Resources (Irish Sea) Limited (part of Harbour Energy)). There is also potential for blocks to become licenced in future (i.e. through Oil and Gas Licensing Rounds), but the assessment of this potential impact is complicated by a degree of uncertainty.

The receptor is deemed to be of negligible vulnerability, moderate recoverability and low value. The sensitivity of the receptor is therefore, considered to be **negligible**.

Significance of effect

Overall, it is predicted that the sensitivity of the receptor is considered to be **negligible** and the magnitude is deemed to be **medium**. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is **not significant**. The effect has been defined as **minor**, rather than negligible, as there will still be a perceptible effect, although it is unlikely to be critical in the decision-making process.

12.11.6.3 Decommissioning phase

The effects of decommissioning activities are expected to be the same or similar to the effects from construction. As set out in Table 12.7, the effect is therefore, considered to be of **minor adverse** significance, which is **not significant**. The effect has been defined as **minor**, rather than negligible, as there will still be a perceptible effect, although it is unlikely to be critical in the decision-making process.

12.12 Cumulative Effects Assessment (CEA) methodology

12.12.1 Methodology

The Cumulative Effects Assessment (CEA) takes into account the impact associated with the Proposed Development together with other projects, plans and activities. The projects, plans and activities selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise carried out to determine those which may have a cumulative effect when considered alongside the Proposed Development. Each project, plan or activity has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

As part of the assessment, all projects, plans and activities considered alongside the Proposed Development have been allocated into 'tiers' reflecting their current stage within the planning and development process.

The tiered approach uses the following categorisations:

- Tier 1
  - Under construction.
  - Permitted application.
  - Submitted application.
  - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact.
- Tier 2
  - Scoping report has been submitted and is in the public domain.
- Tier 3
  - Scoping report has not been submitted.
  - Identified in a relevant development plan.
  - Identified in other plans and programmes.

This tiered approach is adopted to provide a clear assessment of the Proposed Development alongside other projects, plans and activities.

The specific projects, plans and activities scoped into the CEA, are outlined in Table 12.10 and shown in Figure 12.7. All of the projects, plans and activities scoped into the CEA may temporally overlap with the Proposed Development.

Table 12.10: List Of Other Projects, Plans And Activities Considered Within The CEA For Infrastructure And Other Sea Users

Project/Plan	Status	Distance from the regional study area (km)	Distance from the local study area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)
Tier 1						
Awel y Môr	Submitted	Overlaps	1.1	Awel y Môr offshore wind farm, planning to comprise up to 50 wind turbines.	Anticipated to commence in 2026	1 January 2030 to 1 January 2055
Liverpool 2 and River Mersey Approach Channel Dredging	Operational	Overlaps	Overlaps	Dredging activities and dredge disposal sites	N/A	1 July 2019 to 30 June 2028
Mersey Channel and River Maintenance Dredge Disposal Renewal	Operational	Overlaps	Overlaps	Dredging activities and dredge disposal sites	N/A	22 October 2021 to 22 October 2031
Conwy River Dredging	Operational	12.3	20.3	Dredging activities and dredge disposal sites	N/A	10 August 2022 to 10 August 2037
Dee River Dredging	Operational	Overlaps	8.2	Dredging activities and dredge disposal sites	N/A	10 August 2022 to 10 August 2037
Port of Barrow maintenance dredging disposal licence	Operational	34.2	33.9	Dredging activities and dredge disposal sites	N/A	13 September 2016 to 12 September 2026
Liverpool Marina Maintenance Dredging – Sustainable Relocation of Dredged Material to the River Mersey	Operational	11.4	22.2	Dredging activities and dredge disposal sites	N/A	19 February 2021 to 31 March 2030
RNLI Regional Maintenance	Operational	Overlaps	16.4	Dredging activities and dredge disposal sites	N/A	18 April 2019 to 17 April 2029
Tier 2						
Morgan Offshore Wind Project	Pre-application	31.5	36.2	Morgan Offshore Wind Project, an offshore wind farm planning to	1 January 2028 to 31 December 2029	1 January 2030 to 31 December 2065

Project/Plan	Status	Distance from the regional study area (km)	Distance from the local study area (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)
				comprise up to 107 wind turbines.		
Mona Offshore Wind Project	Pre-application	0	8.2	Mona Offshore Wind Project, an offshore wind farm planning to comprise up to 107 wind turbines.		
Morecambe Offshore Windfarm	Pre-application	7.3	9.4	Morecambe Offshore Windfarm, an offshore wind farm planning to comprise up to 40 wind turbines.	1 January 2028 to 31 December 2029	1 January 2030 to 31 December 2065
Tier 3						
MaresConnect	Permitted	Overlaps	Overlaps	MaresConnect is a proposed 750 Megawatt (MW) subsea and underground electricity interconnector system linking the electricity grids in Ireland and Great Britain.	N/A	N/A

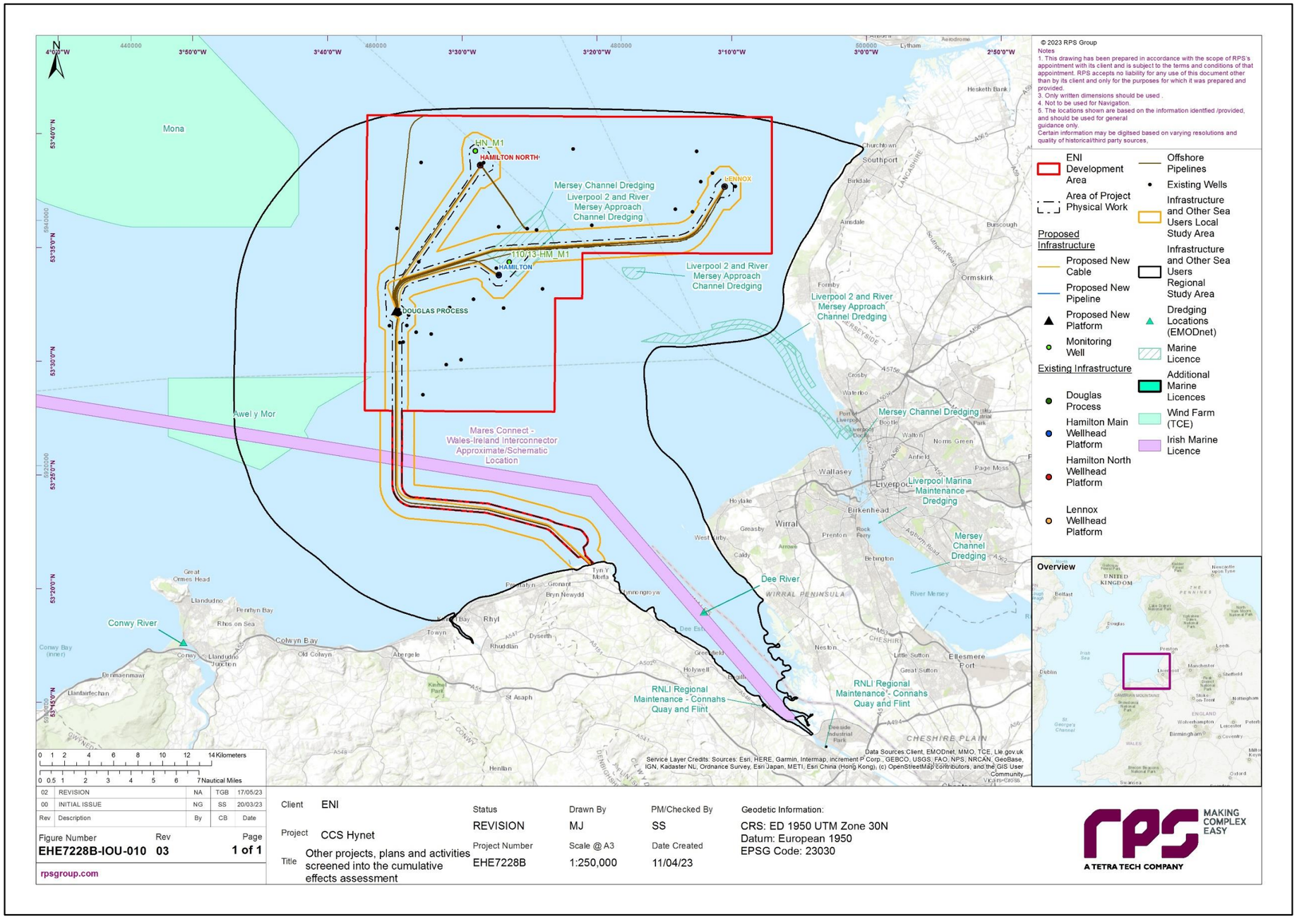

Figure 12.7: Other Projects, Plans And Activities Screened Into The CEA For Infrastructure And Other Sea Users

12.12.2 Cumulative maximum design scenario

The MDSs identified in Table 12.11 have been selected as the design options having the potential to result in the greatest effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section are based on the PDE as well as the information available on other projects, plans and activities in order to inform an MDS. Effects of greater adverse significance are not predicted to arise if the development scenario to be taken forward in the final design scheme is within the PDE.

The range of potential cumulative impacts identified in Table 12.11 below is a subset of those considered for the Proposed Development alone assessment (Table 12.8). This is for one of two reasons:

- The potential impacts identified and assessed for the Proposed Development alone are relatively localised and have limited, or no, potential to interact with similar impacts associated with other projects.
- The potential significance of impact has been assessed as negligible for the Proposed Development alone and therefore has limited or no potential to interact with similar impacts associated with other projects.

Of the impacts set out in Table 12.11, the following have not been included in the CEA:

- Displacement of recreational activities during the construction and decommissioning phases is considered to be a localised effect, with no potential to interact with similar impacts associated with other projects.
- Increased SSCs and associated deposition affecting recreational diving and bathing sites is considered to be either of minor or negligible adverse effect, and impacts will be localised with limited potential to interact with similar impacts associated with other projects.
- Impacts to existing cables or pipelines or restrictions on access to cables or pipelines is considered to be a localised effect, with no potential to interact with similar impacts associated with other projects.
- Reduction or restriction of oil and gas exploration activities (including surveys, drilling and the placement of infrastructure) is considered to be a localised effect, with no potential to interact with similar impacts associated with other projects.

Table 12.11: Maximum Design Scenario Considered For The Assessment Of Potential Cumulative Effects On Infrastructure And Other Sea Users

[a] C=construction, O&M=operations and maintenance, D=decommissioning

Potential cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O&M	D		
Displacement of recreational activities	×	✓	×	MDS as described for the Proposed Development (Table 12.8) assessed cumulatively with the following other projects/plans: **Tier 1** • Awel y Môr. **Tier 2** • Mona Offshore Wind Project • Morecambe Offshore Windfarm • Morgan Offshore Wind Project.	Outcome of the CEA will be greatest when the greatest amount of the largest infrastructure and associated minimum spacing and the greatest extent of advisory safety zones are considered in-combination. Plans and projects which have the potential to displace recreational activities have been included.
Increased SSCs and associated deposition affecting aggregate extraction areas	✓	✓	✓	MDS as described for the Proposed Development (Table 12.8Table 12.8) assessed cumulatively with the following other projects/plans: **Tier 1** • Liverpool Marina Maintenance Dredging – Sustainable Relocation of Dredged Material to the River Mersey • Liverpool 2 and River Mersey Approach Channel Dredging • Mersey Channel and River Maintenance Dredge Disposal Renewal • Castletown Bay Dredging, Isle of Man • Douglas Harbour Dredging, Isle of Man • Conwy River Dredging • Dee River Dredging • Port of Barrow maintenance dredging disposal licence • RNLI Regional Maintenance • Awel y Môr. **Tier 2** • Mona Offshore Wind Project • Morecambe Offshore Windfarm • Morgan Offshore Wind Project. **Tier 3** • MaresConnect.	Outcome of the CEA will be greatest when the greatest number of other plans and projects are considered in-combination. Activities from plans and projects that potentially increase suspended sediment concentrations during the temporal overlap with the Proposed Development phases have been included as these may create a cumulative impact on aggregate extraction areas.

12.13 Cumulative effects assessment

A description of the significance of cumulative effects upon other sea users receptors arising from each identified impact is given below.

12.13.1 Displacement of recreational activities

The presence of the platform, wells, pipelines and cables and the advisory safety zones associated with these may lead to the displacement of recreational activities such as sailing and motor cruising, recreational fishing and inshore water sports. Should the Proposed Development exist at the same as the other projects cited, there is the potential for a cumulative effect.

12.13.1.1 Operations and maintenance phase: Tier 1 and Tier 2

Magnitude of impact

The magnitude of the displacement of recreational activities arising from the presence of infrastructure associated with the Proposed Development during the operations and maintenance phase has been assessed as medium for the Proposed Development alone.

The operations and maintenance phase of the Proposed Development coincides with the operational phase of Awel y Môr. The proposed Awel y Môr development will comprise up to 50 wind turbines. Combined with the platform for the Proposed Development there will be a cumulative effect on recreational activities due to displacement.

The proposed developments of the Mona Offshore Wind Project, the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm, comprising up to 107, 107 and 40 wind turbines respectively, will be in operation during the operations and maintenance phase of the Proposed Development. The Mona Offshore Wind Project is 8.2 km from the infrastructure and other sea users study area, the Morgan Offshore Wind Project is 36.2 km from the infrastructure and other sea users local study area and the Morecambe Offshore Windfarm is 9.4 km from the infrastructure and other sea users local study area.

The impact is predicted to be of regional spatial extent, long term duration, continuous and irreversible over the 25-year operations and maintenance phase of the Proposed Development. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **medium**.

Sensitivity of the receptor

The sensitivity of the receptor has been assessed and it is considered to be **low**.

Significance of effect

Overall, the magnitude of the cumulative impact is deemed to be medium and the sensitivity of the receptor is considered to be low. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is not significant. The effect has been defined as minor rather than negligible as there will still be a perceptible effect, although it is unlikely to be critical in the decision-making process.

12.13.2 Increased SSCs and associated deposition affecting aggregate extraction areas

Increased SSCs may arise due to seabed preparation involving sand wave clearance, the installation of the platform foundations, the installation and/or maintenance of cables and associated decommissioning activities. Should the other projects cited take place concurrently with the Project (construction or operations and maintenance), there is the potential for a cumulative effect of increased turbidity levels impacting on aggregate extraction areas.

12.13.2.1 Construction phase: tier 1, tier 2 and tier 3

Magnitude of impact

The magnitude of the increase in SSCs and associated deposition arising from activities during the construction phase has been assessed as low for the Proposed Development alone.

The construction phase of the Proposed Development coincides with the operational phases of all dredging and disposal projects presented in Table 12.10. If offshore cable installation and sand wave clearance associated with the Proposed Development and dredging and disposal coincide, both resultant plumes would be advected on the tidal currents; they would travel in parallel, and not towards one another. They are unlikely to interact if offshore cable installation coincides with the use of licensed dredging and disposal sites.

As per Figure 12.2, none of these dredging and disposal projects are located in close proximity to the Proposed Development. The dredging and disposal activities carried out at these sites are also maintenance-related, and therefore are likely to be small-scale which reduces the likelihood and significance of any cumulative effect. As per volume 2, chapter 6, both the residual current and levels of potential sediment transport are low within the infrastructure and other sea users local study area, also reducing the likelihood and significance of any cumulative effect.

The construction phase of the Proposed Development also coincides with the construction phase of Awel y Môr. This project is in close proximity to the infrastructure and other sea users local study area, and interaction of SSC plumes may occur should trenching / piling / drilling activities be undertaken simultaneously. As per volume 2, chapter 6, plumes produced during drilling and sand wave clearance activities within the Awel y Môr Array Area may reach the Proposed Development's area of project physical work at up to 50mg/l on flood tides, with greater interaction at spring tides. Likewise, plumes produced through pre-lay cable trenching within the Awel y Môr Export Cable Corridor may overlap directly with the Proposed Development's area of project physical work though do so at lower values *c*.5mg/l and are only likely to occur if trenching activities occur simultaneously. Cumulative deposition may occur between the POA to Douglas cable trenching and the foundation drilling with the Awel y Môr Array Area, however, interaction is expected to occur at *c*. <1 mm. As such, the magnitude of the cumulative change would be minimal with suspended sediment concentrations from Awel y Môr construction activities reaching the receptors at background values. These cumulative impacts are expected to remain of limited magnitude due to the rapid decrease in SSC and deposition with distance from the source of sediment disturbance.

The Mona Offshore Wind Project, the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm construction phases will also overlap with the Proposed Development construction phase. Construction activities from these other projects may result in increased SSC, but these activities would be of limited spatial extent and frequency and therefore unlikely to interact with sediment plumes from the Proposed Development.

Finally, the construction phase of the Proposed Development may overlap with the construction or operational phase of MaresConnect. This project overlaps with the Offshore Cable Corridor, and similarly to Awel y Môr interaction of SSC plumes on spring tide events may occur should trenching activities be undertaken simultaneously. The concentration of suspended sediment reduces significantly moving further from activity so the potential for overlap of resultant plumes with MaresConnect would be low.

SSC plumes are localised to within the immediate vicinity of the construction activity and returning to background levels, therefore travelling on the tide in parallel will most likely avoid interception of the most concentrated suspended sediment part of each plume. As per volume 2, chapter 6, both the residual current and levels of potential sediment transport are low within the infrastructure and other sea users local study area, also reducing the likelihood and significance of any cumulative effect.

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

Sensitivity of receptor

The sensitivity of the receptor has been assessed and it is considered to be medium.

Significance of effect

Overall, the magnitude of the cumulative impact is deemed to be low and the sensitivity of the receptor is considered to be medium. As set out in Table 12.7, the effect will therefore be of minor adverse significance, which is not significant.

12.13.2.2 Operations and maintenance phase

Magnitude of impact

The magnitude of the increase in suspended sediment concentrations and associated deposition arising from activities during the operations and maintenance phase has been assessed as negligible for the Proposed Development alone.

The operations and maintenance phase of the Proposed Development coincides with the operational phases of all of the dredging and disposal projects presented in Table 12.10 other than the Liverpool 2 and River Mersey Approach Channel Dredging and RNLI Regional maintenance. If activities such as cable repair and reburial associated with the Proposed Development and dredging and disposal coincided, both resultant plumes would be advected on the tidal currents, they would travel in parallel, and not towards one another. They are unlikely to interact if cable repair and reburial coincides with the use of licensed dredging and disposal sites.

As per Figure 12.2, none of these dredging and disposal projects are located in close proximity to the Proposed Development. The dredging and disposal activities carried out at these sites are also maintenance-related, and therefore are likely to be small-scale which reduces the likelihood and significance of any cumulative effect. As per volume 2, chapter 6, both the residual current and levels of potential sediment transport are low within the infrastructure and other sea users local study area, also reducing the likelihood and significance of any cumulative effect.

The operations and maintenance phase of the Proposed Development also coincides with the operational phase of Awel y Môr. Cumulative effects arising from construction activities from this project is likely to be low. Maintenance activities are both intermittent and a smaller scale than that of the construction phase and therefore any potential cumulative impacts are less likely to occur and be on a smaller scale.

The Mona Offshore Wind Project, the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm operations and maintenance phases will also overlap with the Proposed Development operations and maintenance phase. Maintenance activities are both intermittent and a smaller scale than that of the construction phase and therefore any potential cumulative impacts are less likely to occur and be on a smaller scale.

Similarly to the above, the operations and maintenance phase of the Proposed Development may coincide with the construction, operational or decommissioning phases of MaresConnect. Maintenance activities are both intermittent and a smaller scale than that of the construction phase and therefore any potential cumulative impacts are less likely to occur and be on a smaller scale.

As per volume 2, chapter 6, both the residual current and levels of potential sediment transport are low within the infrastructure and other sea users local study area, also reducing the likelihood and significance of any cumulative effect.

The cumulative effect is predicted to be of regional spatial extent, long term duration, low frequency and reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **negligible**.

Sensitivity of receptor

The sensitivity of the receptor has been assessed and it is considered to **be medium**.

Significance of effect

Overall, the magnitude of the cumulative impact is deemed to be negligible and the sensitivity of the receptor is considered to be medium. As set out in Table 12.7, the effect will therefore be of **minor adverse** significance, which is not significant. The effect has been defined as minor rather than negligible as there will still be a perceptible effect, although it is unlikely to be critical in the decision-making process.

12.13.2.3 Decommissioning phase

Significance of effect

The effects of decommissioning activities are expected to be the same or similar to the effects from construction. As set out in Table 12.7, the effect is therefore considered to be of **minor adverse** significance, which is not significant.

12.14 Transboundary effects

A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects with regard to other sea users from the Proposed Development upon the interests of other states.

12.15 Summary of impacts, mitigation measures and monitoring

Information on infrastructure and other sea users within the infrastructure and other sea users local and regional study areas was collected through desktop reviews of available datasets.

- Table 12.12 presents a summary of the potential impacts, measures adopted as part of the Proposed Development and residual effects in respect to infrastructure and other sea users. Overall, it is concluded that there will be no significant effects arising from the Proposed Development during the construction, operations and maintenance, or decommissioning phases.
- Table 12.13 presents a summary of the potential cumulative impacts, mitigation measures and residual effects. Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects/plans.
- No potential transboundary impacts have been identified in regard to effects of the Proposed Development.

Table 12.12: Summary of Potential Environmental Effects, Mitigation and Monitoring

[a] C=construction, O&M=operations and maintenance, D=decommissioning

Potential impact	Phase[a]			Measures adopted as part of the Proposed Development	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O&M	D							
Displacement of recreational activities	✓	✓	✓	Promulgation of information advising on the nature, timing and location of activities, including through Notices to Mariners, safety zones.	C: Low O: Medium D: Low	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	N/A	N/A	N/A
Increased SSCs and associated deposition affecting recreational diving and bathing sites	✓	✓	✓	Promulgation of information advising on the nature, timing and location of activities, including through Notices to Mariners, safety zones.	C: Low O: Negligible D: Low	C: Low O: Low D: Low	C: Minor O: Negligible D: Minor	N/A	N/A	N/A
Impacts to existing cables or pipelines or restrictions on access to cables or pipelines	✓	✓	✓	Safety zones, cable and pipeline crossing/proximity agreements, consultation with oil and gas operators.	C: Low O: Low D: Low	C: Medium O: Medium D: Medium	C: Minor O: Minor D: Minor	N/A	N/A	N/A
Increased SSCs and associated deposition affecting aggregate extraction areas	✓	✓	✓	Promulgation of information advising on the nature, timing and location of activities, including through Notices to Mariners, safety zones.	C: Low O: Negligible D: Low	C: Medium O: Medium D: Medium	C: Minor O: Minor D: Minor	N/A	N/A	N/A
Reduction or restriction of oil and gas	✓	✓	✓	Safety zones, consultation with oil and gas operators.	C: Medium O: Medium	C: Negligible O: Negligible	C: Minor O: Minor	N/A	N/A	N/A

Potential impact	Phase[a] C	O&M	D	Measures adopted as part of the Proposed Development	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
exploration activities (including surveys, drilling and the placement of infrastructure)					D: Medium	D: Negligible	D: Minor			

Table 12.13: Summary of Potential Cumulative Environmental Effects, Mitigation and Monitoring

[a] C=construction, O&M=operations and maintenance, D=decommissioning

Potential impact	Phase[a]			Measures adopted as part of the Proposed Development	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O&M	D							
Tier 1, Tier 2 and Tier 3										
Displacement of recreational activities	×	✓	×	Promulgation of information advising on the nature, timing and location of activities, including through Notices to Mariners, safety zones.	O: Medium	O: Low	O: Minor	N/A	N/A	N/A
Increased SSCs and associated deposition affecting aggregate extraction areas	✓	✓	✓	Promulgation of information advising on the nature, timing and location of activities, including through Notices to Mariners, safety zones.	C: Low O: Negligible D: Low	C: Medium O: Medium D: Medium	C: Minor O: Minor D: Minor	N/A	N/A	N/A

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