

**BURBO BANK  
EXTENSION  
OFFSHORE  
WIND FARM**



DONG Energy Burbo Extension (UK) Ltd.

**Environmental Statement  
Volume 2 - Chapter 23: Other Infrastructure  
and Licenced Activities**

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## **Burbo Bank Extension offshore wind farm**

DONG Energy Burbo Extension (UK) Ltd

### **Environmental Statement**

Volume 2 – Offshore, Human Technical Chapters 17-23

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## Table of contents

23.	Other Infrastructure and Licensed Activities	3
23.1	Introduction	3
23.2	Planning Policy Context	3
23.3	Consultation	4
23.4	Study Area	6
23.5	Methodology	8
23.6	Baseline Environment	9
	Oil and gas licenses, hydrocarbon fields, infrastructure and other facilities and activities	9
	Cables	18
	Offshore wind farms	20
	Aggregate extraction and maintenance dredging	22
	Waste disposal sites	22
	Underground coal gasification (UCG)	23
23.7	Key Parameters for Assessment	26
23.8	Assessment Criteria and Assignment of Significance	29
23.9	Assessment of Significance	31
	Mitigation Measures Adopted as Part of the Project	31
	Construction Phase	33
	Operational and Maintenance Phase	37
	Decommissioning Phase	40
	Cumulative Impact Assessment	41
	Trans-boundary Effects	43
	Inter-Related Effects	43
23.10	Conclusion and summary tables	44
	Glossary	49
	References	50

## List of tables

Table 23.1: Summary of NPS EN-3 provisions relevant to this chapter.	4
Table 23.2: Consultation responses relevant to this chapter	5
Table 23.3: Summary of key data sources.	8
Table 23.4: Design envelope scenario considered for the assessment of potential impacts on Other Infrastructure and Licensed Activities.	27
Table 23.5: Environmental value (Sensitivity)	29
Table 23.6: Magnitude of environmental impacts	30
Table 23.7: List of other projects assessed for cumulative impact	41
Table 23.8: Summary of significance, mitigation and monitoring	45

## List of figures

Figure 23.1: Study area	7
Figure 23.2: Oil and gas Licence Blocks	11
Figure 23.3: Douglas bridge-linked oil and gas complex (source: BHP Billiton)	13
Figure 23.4: Helicopter main routes around the Project site © Reproduced by permission of the CAA, NATS and OS 2012	14
Figure 23.5: Oil and gas infrastructure	17
Figure 23.6: Telecommunication and power cables	19
Figure 23.7: Offshore wind farms in the vicinity of the Project	21
Figure 23.8: Other licensed activities	25

## 23. Other Infrastructure and Licensed Activities

### 23.1 Introduction

23.1.1 This chapter of the Environmental Statement (ES) presents the details of the Environmental Impact Assessment (EIA) for the potential impacts of the Burbo Bank Extension offshore wind farm ("Project") on the following infrastructure and licensed activities that either exist, or are being planned, within the study area (as detailed in section 23.4, the study area is defined as the wider Liverpool Bay area):

- Oil and gas licences, fields, infrastructure, facilities, and activities;
- Offshore cables;
- Offshore wind farms;
- Aggregate extraction and maintenance dredging;
- Spoil disposal; and
- Underground coal gasification (UCG).

23.1.2 The purpose of this chapter in the Project ES is to identify and assess the likely significant effects of the Project on Other Infrastructure and Licenced Activities. The Project for which development consent is sought consists of an extension westwards of the existing Burbo Bank offshore wind farm. The proposed offshore Project site covers an area of 40 km<sup>2</sup> which lies approximately 7 km north off the north Wirral coast. The maximum capacity of the wind farm will be up to 258 MW, consisting of offshore wind turbines and foundations, an offshore substation, buried inter-array and export cable(s), buried onshore cable(s) from the cable landfall in north Wales between Rhyl and Prestatyn to a new onshore substation next to the Bodelwyddan substation near St Asaph in Denbighshire where the cable will connect with the National Grid. Further details on the Project infrastructure, installation methodologies and timelines can be found in ES Chapter 6 'Project Description'.

23.1.3 All of the existing infrastructure, and each of the existing licensed activities, identified in the above bullet points, underpin commercial activities that generate value by either, using the seabed, or exploiting natural resources. The potential effects assessed within this chapter principally relate to interference with these ongoing commercial operations.

23.1.4 Potential impacts during each phase of the Project, i.e. construction, maintenance and decommissioning, are assessed and mitigation measures are discussed.

### 23.2 Planning Policy Context

23.2.1 Planning policy on offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs) is contained in the National Policy Statements (NPSs) for Overarching Energy (EN-1; DECC, 2011a) and Renewable Energy Infrastructure (EN-3, DECC, 2011b).

23.2.2 The NPSs identify a number of issues relevant to this chapter. These are summarised in Table 23.1 below.

Table 23.1: Summary of NPS EN-3 provisions relevant to this chapter.

Summary of NPS provision	Consideration in ES
Oil, gas and other offshore infrastructure and activities	
<p>Where a potential offshore wind farm is proposed close to existing operational offshore infrastructure, or has the potential to affect activities for which a licence has been issued by Government, the applicant should undertake an assessment of the potential effect of the proposed development on such existing or permitted infrastructure or activities. (paragraph 2.6.179 of NPS EN-3).</p>	<p>The results of an assessment of the potential effect of the Project on existing operational offshore infrastructure, and activities for which a licence has been issued by Government, are presented in this chapter. All potential impacts, from each stage of the development lifecycle, have been assessed. The baseline environment has been characterised by a combination of desk-based study and consultation with operators of offshore infrastructure and/or licensed activities.</p>
<p>Applicants should engage with interested parties early in the development phase of the proposed offshore wind farm, with an aim to resolve as many issues as possible prior to the submission of an application (paragraph 2.6.180 of NPS EN-3).</p>	<p>Interested parties responsible for operating infrastructure and/or undertaking licensed activities within the potentially affected offshore study area, have been consulted. Further details are provided in Section 23.3 below.</p>

## 23.3 Consultation

23.3.1 ES Chapter 7 'Consultation' outlines the consultation activities which have been undertaken in respect of the Project.

23.3.2 Since November 2010, DONG Energy Burbo Extension (UK) Ltd ("the Applicant") has undertaken extensive consultation with the operators of Other Infrastructure and Licensed Activities undertaking operations within the study area. A number of issues have been raised between the Applicant and these operators. Of most relevance to this chapter is the requirement to establish crossing and proximity agreements with cable and pipeline operators. These agreements are currently being drafted.

23.3.3 Table 23.2 below summarises the issues relevant to this chapter which have been highlighted by the consultees and indicates how, if possible, these issues have been addressed within this ES.

Table 23.2: Consultation responses relevant to this chapter.

Date	Consultee and type of response	Issues Raised	How/where addressed
2010-2012	BHP Billiton. Six consultation meetings held and written responses exchanged.	Crossing of the 3 BHP Billiton operated pipelines (PL1030, PL1032, and PL1033) that connect the Douglas platform with the Point of Ayr terminal. Other issues, such as helicopter access, marine radar and marine navigation are addressed in ES Chapter 22 'Helicopter Access to Oil and Gas Platforms', ES Chapter 21 'Aviation, Defence, Radar and Telecommunications' and ES Chapter 17 'Shipping and Navigation' respectively.	Crossing agreements to be signed, Section 23.9 (Pipeline and cable crossings) and Section 23.9 (The crossing structures required as a result of the installation of the Project's export cable impacts repair of existing cables and pipelines).
2011-2012	IGas Energy. Two consultation meetings held and written responses exchanged.	Potential interaction between respective construction operations and development activities.	Liaison to be maintained, Section 23.9 (The Project's export cable-lay operations interfere with oil and gas operations when the cable is laid across licensed Blocks).
2011-2012	EirGrid. Two consultation meetings held.	Requirement for crossing agreement covering the Project's export cable crossing the east-west Interconnector.	Crossing agreement to be signed, Section 23.9 (Pipeline and cable crossings)
2011-2012	Scottish Power. Four consultation meetings held.	Requirement for crossing agreement covering the Project's export cable crossing the western HVDC Link.	Crossing agreement to be signed, Section 23.9 (Pipeline and cable crossings).

Table 23.2: continued

Date	Consultee and type of response	Issues Raised	How/where addressed
2010-2012	RWE npower renewables. Six consultation meetings held, technical report and written responses exchanged.	Requirement for proximity agreement covering the Project's export cable approaching the North Hoyle wind farm export cable, and concerns raised regarding a potential wake loss effect caused by the Project on the Gwynt y Môr offshore wind farm.	Proximity agreement to be signed, quantitative study accepted by RWE, Sections 23.9 (Pipeline and cable crossings) and 23.9 (Physical presence of the wind turbines causes a wake-loss effect on the Gwynt y Môr offshore wind farm) respectively.
2012	Riverside Energy. Consultation meetings held, and written responses exchanged.	Objection raised based on overlap between conditional UCG licence area and Project Site.	As described below, and in Section 23.7, this issue will no longer arise and has been scoped out of the EIA.

23.3.4 In 2012 Riverside Energy responded to the Applicant's Preliminary Environmental Information Technical Report Version 2 (PEI) report raising an objection to the Project on account of the significant overlap between Riverside Energy's conditional UCG licence area and the Project Site. Subsequently, The Coal Authority (TCA) confirmed that, if an extension to the term of the UCG licence is sought in 2013, the UCG licence area will be reduced to avoid any overlap with the Project Site and to incorporate a safety buffer zone.

## 23.4 Study Area

23.4.1 The offshore study area evaluated within this chapter extends to the wider Liverpool Bay area, i.e. across an approximate square with opposite corners located at Great Ormes Head in Wales, and south of the Ribble Estuary in Lancashire, England. The offshore study area was delineated following a detailed consideration of the receptor types covered within this chapter, and the range over which the potential Project impacts might reasonably extend. This process incorporated discussions with relevant stakeholders, and the extraction of information from relevant data sources to identify and detail potentially affected assets and interests.

23.4.2 The study area is shown in Figure 23.1.

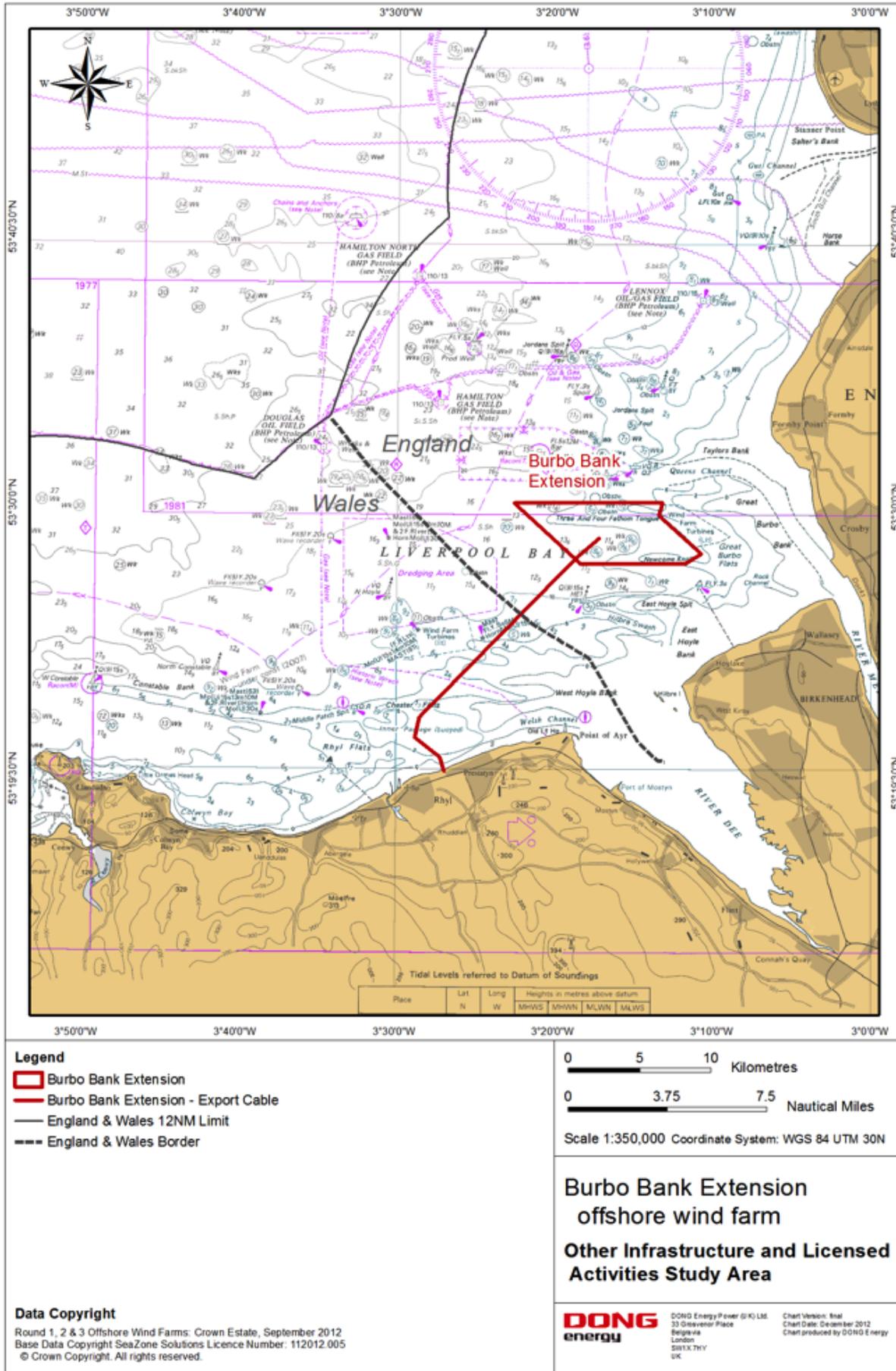


Figure 23.1: Study area

## 23.5 Methodology

23.5.1 Dedicated survey data was not acquired for the purposes of the assessment outlined in this chapter. However, other pre-existing historical data, that adequately serves the purpose of the assessment, was collected and reviewed. The location of most licensed offshore activities can be obtained from the licensing / regulatory authorities, or the operators of existing activities. The key data sources, utilised to characterise the baseline environment, are summarised in Table 23.3 below.

*Table 23.3: Summary of key data sources.*

Source	Receptor	Year	Reference
The Department for Energy and Climate Change (DECC) 'Oil & Gas, Data and Maps', and Oil & Gas UK DEAL websites	Oil and gas licences, fields, infrastructure, and wells	2012	DECC, 2012a UK DEAL, 2012
Kingfisher Information Service - Cable Awareness (KISCA) website	Cables	2012	KISCA, 2012
The Crown Estate's Offshore Wind Lease Agreement Areas website	Offshore wind farms	2012	The Crown Estate, 2012a
The Crown Estate's Aggregate Licence Area website	Marine aggregates	2012	The Crown Estate, 2012b
Annual data-set produced by the Centre for Environment Fisheries & Aquaculture Science (Cefas), and recent disposal data produced by the Marine Management Organisation (MMO)	Spoil disposal	2011 and 2012	N/a
DECC website	Underground coal gasification (UCG)	2012	DECC, 2012b

23.5.2 DECC is the competent authority responsible for issuing licences to oil and gas developers operating on the United Kingdom Continental Shelf (UKCS). Under the Marine and Coastal Access Act 2009, the Marine Management Organisation (MMO) as the competent authority, or the Welsh Government Marine Consents Unit (WG MCU) as the competent authority in Welsh waters, can licence marine aggregate extraction, disposal sites, cables, and renewable energy developments in the UK Marine Area adjacent to England and Wales respectively. In order to carry out an activity, applicants must also secure a licence from the relevant landowner, which in the majority of cases will be The Crown Estate.

23.5.3 The standard EIA methodology outlined in ES Chapter 3 'Environmental Impact Assessment Process', and detailed throughout the remainder of this chapter, required the location and status of all existing, and reasonably foreseeable, infrastructure and licensed activities to be established, such that an assessment of the potential Project impacts upon the identified receptors can be undertaken. Potential impacts during each phase of the Project, i.e. construction, maintenance and decommissioning, are identified and likely significant effects assessed. Mitigation measures are also discussed.

## 23.6 Baseline Environment

23.6.1 This section describes the existing environment within the study area in terms of other infrastructure and licensed activities that either exist, or are being planned offshore.

### Oil and gas licenses, hydrocarbon fields, infrastructure and other facilities and activities

23.6.2 The area around the Project Site features the oil and gas interests outlined below, the locations of which are shown in Figure 23.2 and Figure 23.5. Helicopter access to, and egress from, oil and gas facilities is assessed separately in ES Chapter 22 'Helicopter Access to Oil and Gas Platforms'.

### Licence Blocks

23.6.3 The Project Site is almost entirely located within UKCS Licence Blocks ('Blocks') 110/19b and 110/20 (DECC, 2012a). These two Blocks were excluded from the 27<sup>th</sup> Seaward Licensing Round offer on account of the fact that they have a conditional TCA lease issued within them for an UCG development.

23.6.4 Otherwise, the oil and gas Blocks within the study area have either been awarded by DECC under previous Seaward Licensing Rounds, are currently unlicensed, or remain under offer as part of the 27<sup>th</sup> Licensing Round. Blocks 110/9c and 110/10 were the two Blocks located within the study area that were applied for under the 27<sup>th</sup> Licensing Round. However, their award remains subject to an Appropriate Assessment, and a decision will be made on whether, or not, to grant these licences in 2013.

23.6.5 The northern perimeter of the Project Site is located within Block 110/14b. Block 110/14b was relinquished by EOG Resources (UK) Ltd. in June 2011 and, along with Blocks 110/15b, 110/13c, and 110/18b (located immediately north, northwest and west of the Project Site respectively), was under offer as part of the 27<sup>th</sup> Licensing Round. However, none of these Blocks were applied for during the 27<sup>th</sup> Licensing Round. Further afield, to the northwest and west of the Project, Blocks 110/6, 110/11, 110/12b, 110/13e, 110/16, 110/17, 110/21 and 110/22, were under offer as part of the 27<sup>th</sup> Licensing Round. However, none of these Blocks were applied for during the 27<sup>th</sup> Licensing Round.

23.6.6 Blocks 110/18a, 110/19a and 110/23, located immediately south and southwest of the Project Site, are currently under licence to IGas Energy Plc. These Blocks, collectively referred to as 'Point of Ayr', were acquired by IGas Energy Plc. under the 24<sup>th</sup> Round in 2007 and have the potential to produce conventional gas, shale gas, and Coal Bed Methane (CBM). IGas Energy is planning to drill a well during 2012 or 2013, and may undertake drilling operations from an onshore location (within the onshore Licence Block PEDL 107). If offshore drilling operations are required, crew change and supply activity would, in all likelihood, take place via boat from Mostyn Harbour (as discussed in a meeting with IGas Energy Plc. on the 07 June 2011). The proposed offshore export cable route for the Project crosses the Point of Ayr Licence Blocks 110/18a and 110/19a.

23.6.7 Further afield, north and northwest of the Project Site, Blocks 110/14c, 110/15a, 110/14a, 110/13a and 110/13b are currently under Licence to BHP Billiton Petroleum Ltd. In 2011 BHP Billiton Petroleum Ltd. relinquished Block 110/13c (awarded to them under the 24<sup>th</sup> Round in 2007). The decision to relinquish this Block followed the merger and reprocessing of four seismic datasets covering 1,085 km<sup>2</sup> and the drilling, in 2010, of an unsuccessful exploration well located in Block 110/13b. Blocks 110/7d, 110/8c, 110/9a, 110/14d and, to the north and northwest of the Project Site, are operated by Burlington Resources (Irish Sea) Ltd., Blocks 110/12a and 110/7b, to the northwest of the Project are operated by EOG Resources UK Ltd., and Block 110/8b, also to the northwest of the Project is operated by Serica Energy (UK) Ltd.

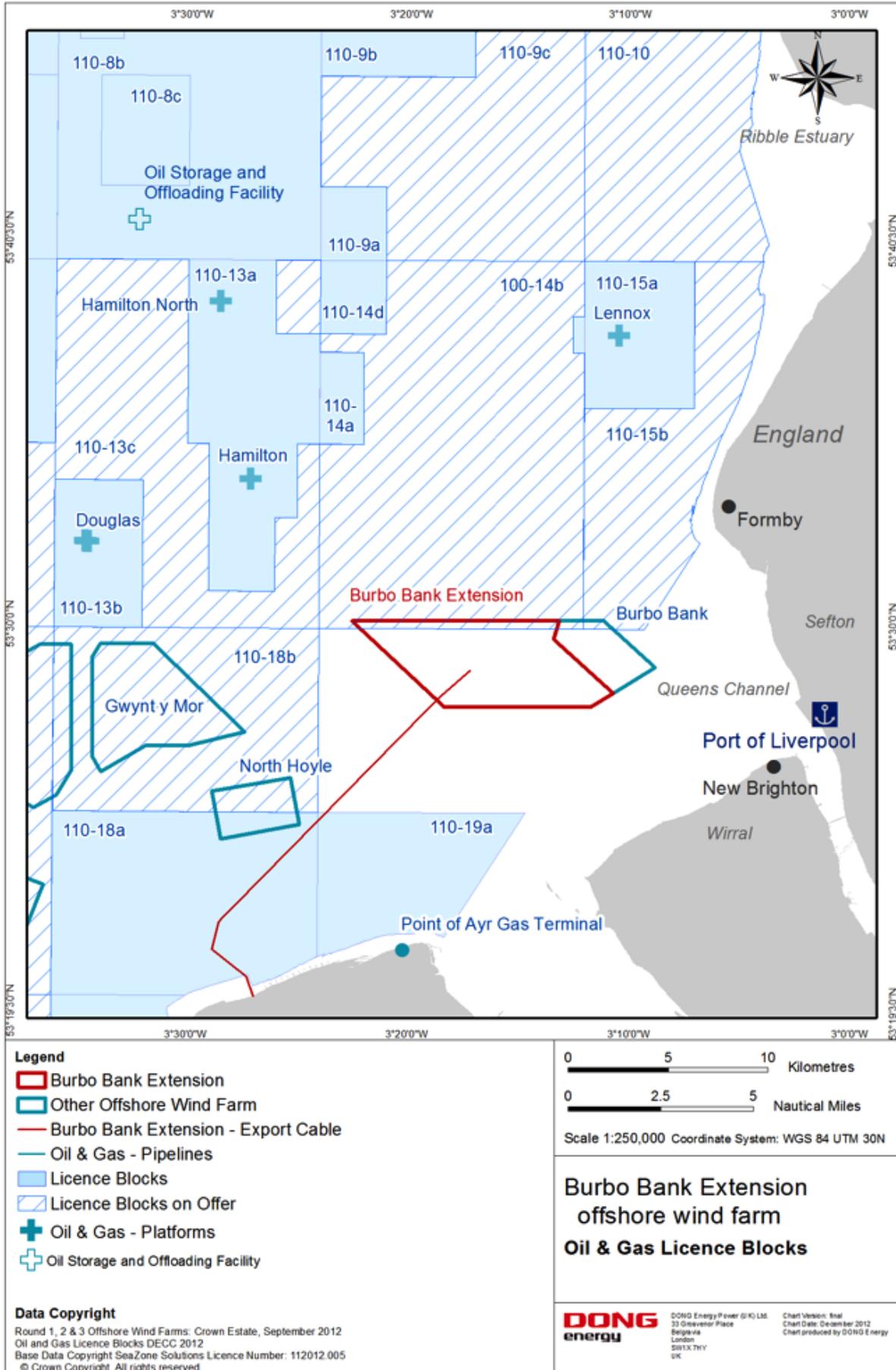


Figure 23.2: Oil and gas Licence Blocks

### **Hydrocarbon fields**

23.6.8 Contingent with the above licence Blocks, five hydrocarbon producing fields are located north and northwest of the Project Site, namely the Hamilton (6 km), Hamilton east (10 km), Hamilton north (16 km), Douglas (12 km), and Lennox (13 km) fields, all of which are owned and operated by BHP Billiton Petroleum Ltd. The fields, collectively known as the Liverpool Bay Asset, came on stream between 1996 and 2003 with a development life of at least 20 years, and comprise two oil with associated gas fields (Douglas and Lennox), and three gas fields (Hamilton, Hamilton north and Hamilton east).

23.6.9 EOG Resources (UK) Ltd. are currently developing the Conwy and Corfe fields located further northwest (17 km) in Block 110/12a. Communication with the operator developing these fields (in October 2012) indicated that first oil is scheduled for early 2013.

### **Infrastructure and other facilities**

23.6.10 Existing oil and gas infrastructure within the study area comprises the below listed facilities that together constitute the Liverpool Bay Development operated by BHP Billiton Petroleum Ltd. and a newly installed Normally Unattended Installation (NUI) at the Conwy and Corfe fields (see Figure 23.5).

23.6.11 Platforms: Offshore operations are centred on the manned Douglas complex (see Figure 23.3), a three-platform (accommodation, central processing, and wellhead tower), bridge-linked facility located 14 km west northwest of the Project Site, that monitors, controls and receives oil and gas from three unmanned satellite platforms at Lennox (15 km N), Hamilton (9 km northwest), and Hamilton north (18 km north northwest). Each platform is protected by a 500 m exclusion zone. In addition to these fixed platform structures, the Hamilton east field has been developed via a subsea well-head (12 km northwest) tied back to the Hamilton north platform.

23.6.12 Personnel are transported to, and from, the oil and gas platforms using helicopters. The helicopter main routes depicted in Figure 23.4, are air traffic service routes in which offshore commercial air traffic helicopters operate on a regular and frequent basis. Helicopter main routes have no airspace status and assume the background airspace classification within which they lie (in the case of the Liverpool Bay, Class G, uncontrolled airspace).



*Figure 23.3: Douglas bridge-linked oil and gas complex (source: BHP Billiton)*

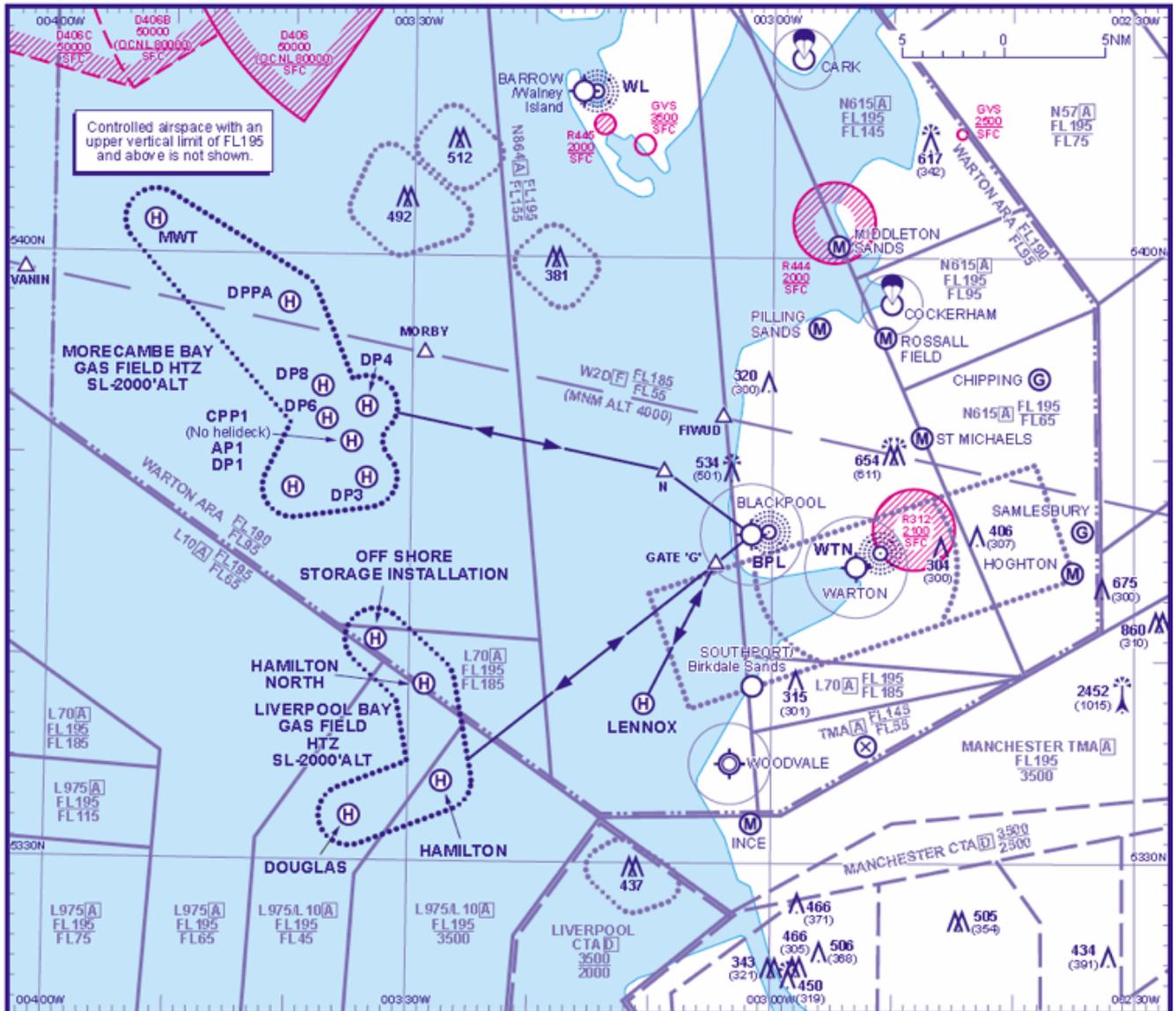


Figure 23.4: Helicopter main routes around the Project site © Reproduced by permission of the CAA, NATS and OS 2012

23.6.13 Pipelines: the Liverpool Bay development incorporates a total of fourteen connecting pipelines ranging from 2 to 24 inches in diameter and 7 to 34 kilometres in length. Gas, extracted from Hamilton and Hamilton north, as well as from Lennox, is part processed on Douglas before it travels via a 20-inch diameter, 34 km long, natural gas export pipeline (PL 1030) to BHP Billiton's gas terminal, at Point of Ayr, on the north Wales coast. A 3-inch chemical supply pipeline (PL 1033), and a 3-inch mixed water/hydrocarbon pipeline (PL 1032), transport these liquids to the Douglas platform, and are laid together in a separate trench that runs alongside the main 20-inch export pipeline. The Project export cable will cross the three pipelines identified above (PL 1030, PL 1032, and PL1033) in Welsh territorial waters near the Mid-Hoyle Channel, and therefore on-going consultation is progressing with regards to crossing strategies and agreements.

23.6.14 Oil storage and offloading facility: oil, produced from the Lennox and Douglas fields, is processed, blended and sent through a 20 km pipeline, to an offshore storage installation (a double-sided 870,000 barrel capacity tanker, protected by a 800 m exclusion zone.) located to the north of the platforms (23 km northwest of the Project Site), before being loaded into tankers.

23.6.15 Support vessels: the Liverpool Bay Development is served by the Irish Sea Pioneer, a mobile, self-elevating operations support vessel, as well as a number of support and supply vessels, that make use of a base at Heysham, and a helicopter connection to the Blackpool Heliport. From time to time, a jack-up drilling rig may also be present within the study area.

### ***Infrastructure and other facilities under construction***

23.6.16 The infrastructure currently being constructed within the study area is limited to the facilities associated with EOG Resources (UK) Ltd.'s development of the Conwy and Corfe Fields (24 km northwest of the Project Site). Construction activities, including the installation of a NUI, and a 12 km production flowline to the Douglas complex, as well as the use of a jack-up drilling rig to drill three platform production wells, and two water injection wells, will be complete before construction activities associated with the Project commence.

### ***Wells***

23.6.17 There are a number of producing, suspended, and plugged and abandoned wells located within the study area (see Figure 23.5). This section describes the wells located in the Liverpool Bay area that lie to the S of well 110/10-1, which is itself located approximately midway between the northern and southern perimeters of Block 110/10. In addition to the 54 in-service production and injection wells associated with the Liverpool Bay Development described above, the UK DEAL database (a gateway to information on the UK Offshore Oil & Gas Industry) indicates that, within the study area, there are 12 suspended well heads (i.e. capped well heads that are left protruding a metre or two above the seabed in order to facilitate possible future re-entry), and 59 plugged and abandoned wells, i.e. wells that have been cut-off beneath the seabed and permanently abandoned. None of these in-service, suspended, or plugged and abandoned wells are located within the Project Site, or within the vicinity of the Offshore Cable Route. In relation to the Project Site, the closest suspended and plugged and abandoned wells are located 6 km northwest (at the Hamilton field location), and 3 km north (at an open water location), respectively.

23.6.18 BHP Billiton own eleven of the suspended well heads, ten of which are associated with the Douglas and Hamilton fields and are located in Block 110/13, and one of which is associated with the Lennox field and located in Block 110/15. Burlington Resources (UK) Inc. owns the remaining suspended well head, which is located in Block 110/8. The UK DEAL dataset lists the current owners of the plugged and abandoned wells as BHP, Chevron, ConocoPhillips, EOG, Ithaca, Marathon, NHDA, Shell, Suncor and Total.

### ***Seismic acquisition***

23.6.19 The offshore acquisition of 2D, 3D and Ocean Bottom Cable (OBC) deep seismic data is an activity commissioned by oil and gas developers, and/or survey companies, looking to identify the position and spatial extent of potentially developable hydrocarbon reserves. Given the relatively mature nature of the offshore oil and gas reserves located within the Liverpool Bay area, it is expected that the relative activity levels, associated with the acquisition of this type of seismic data within the study area, may decrease over the Project lifetime.

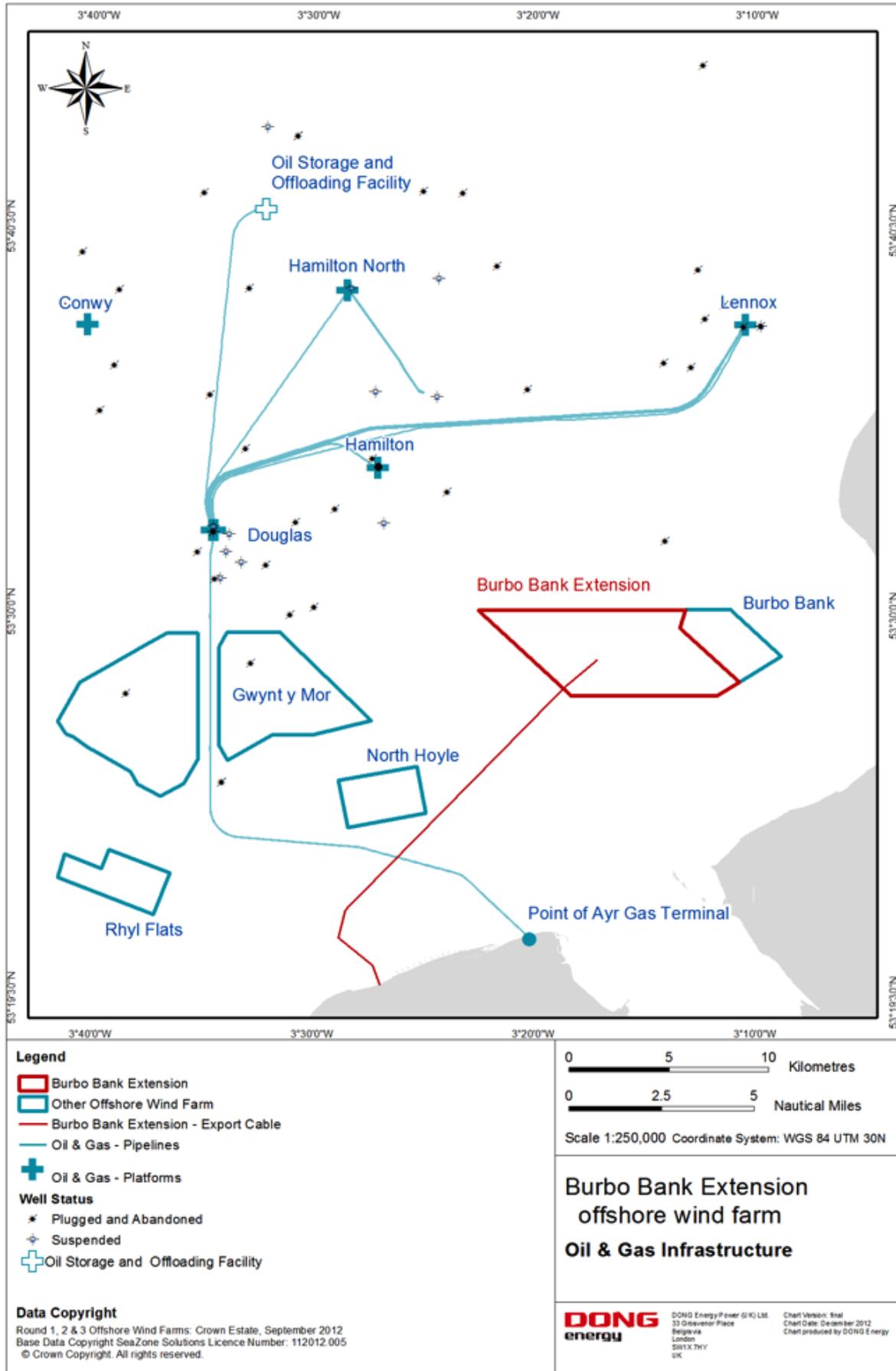


Figure 23.5: Oil and gas infrastructure

## Cables

23.6.20 This section describes both the existing, and consented, subsea cables located within the *study area* (see Figure 23.6).

### Wind farm export cables

23.6.21 The North Hoyle (RWE Npower Renewables) export cable route is located west of the Offshore Cable Route, and for a 1.5 km stretch of its route (occurring approximately 3 km north of Rhyl), is located approximately 500 m west of the Offshore Cable Route. It is expected that a minimum separation of 300 m will be maintained between the two cables. The operational Rhyl Flats (RWE Npower Renewables) export cable route is, at its closest point, located 8 km west of the Offshore Cable Route. The Burbo Bank export cable route runs from the southeast corner of the Project Site southwest to the landfall.

23.6.22 RWE Npower Renewables commenced the installation of four export cables running between the Gwynt y Môr wind farm and the landfall location adjacent to Pensarn, north Wales 2012. The cables are laid as pairs along two separate cable routes and, at its closest point, the nearest of the Gwynt y Môr export cables will be located 7.5 km west of the Offshore Cable Route.

### Telecommunications cables

23.6.23 The following five in-use telecommunication cables are, at their closest points, located between 35 and 65 km northeast of the Project Site: ESAT 2 (ESAT), Hibernia 'A' and 'C' (Hibernia Atlantic), Sirius south (Virgin Media) and Lanis 1 (C&W Worldwide). The cables run from landfall positions located on the E coast of England between Blackpool and southport, to landfall locations on/in the Isle of Man, the Republic of Ireland, Northern Ireland and Canada.

23.6.24 A fibre optic cable, known as the Emerald Express Cable System, has been proposed by Emerald Networks that will link North America, Iceland and the UK. The cable is scheduled to be commissioned in late 2012. If built, at its closest point, the cable will be located approximately 15 km northeast of the Project Site.

### HVDC electrical interconnectors

23.6.25 The 500 MW east-west Interconnector was installed in 2012 by the Irish national grid operator EirGrid. The interconnector has created a link between Rush north Beach in County Dublin and Barkby Beach in Flintshire. At its closest point, the interconnector cable is located approximately 15 km southwest of the Project Site. The Offshore Cable Route will cross the east-west Interconnector cable in Welsh waters approximately 3 km north of the Rhyl coast, close to the edge of the Port of Mostyn buoyed channel.

23.6.26 The consented western HVDC Link interconnector has a proposed transmission capacity of 2,000 MW and will link converter stations located at Hunterston in north Ayrshire, and Connah's Quay in Flintshire. The western HVDC Link is being jointly developed by National Grid Electricity Transmission and SP Transmission. The target date for completion of offshore installation operations is 2015. It is expected that this cable will be routed around the southwest and south perimeter of the Project Site, with a separation of between 0.6 and 1.2 km. As such, the Offshore Cable Route will either cross, or be crossed by, the interconnector cable at a distance between 0.6 and 1.2 km southwest of the southwest corner of the Project Site. Discussions with the developer, aimed at producing a crossing strategy and agreement, are on-going.

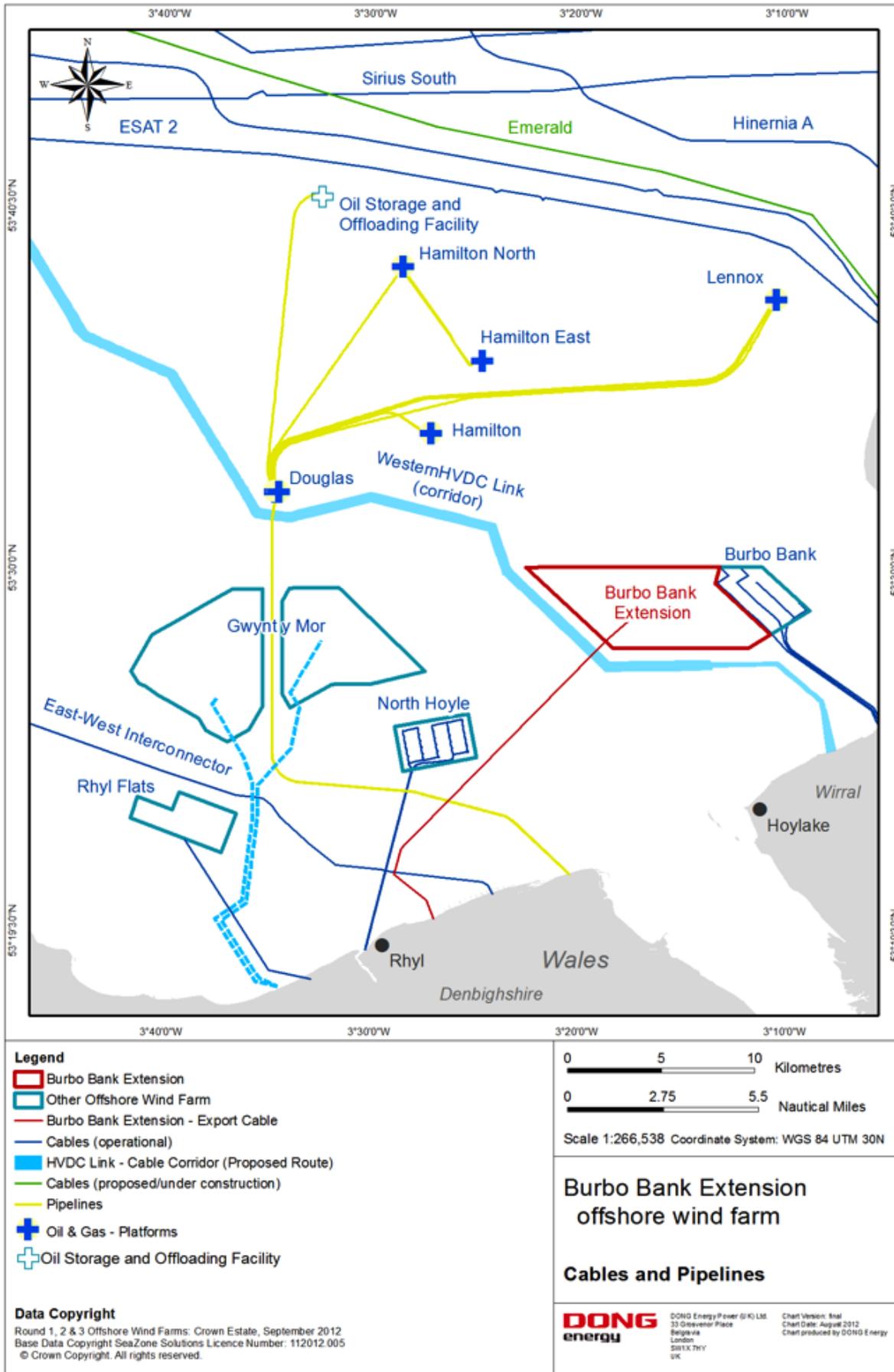


Figure 23.6: Telecommunication and power cables

### Offshore wind farms

23.6.27 The following four Round 1 and Round 2 offshore wind farms are located within the study area (see Figure 23.7):

- The operational Burbo Bank offshore wind farm (90 MW, 25 turbines), operated by DONG Energy, borders the E side of the Project Site;
- The operational North Hoyle offshore wind farm (60 MW, 30 turbines), operated by RWE Npower Renewables, and lies 8 km SW of the Project Site;
- The operational Rhyl Flats offshore wind farm (90 MW, 25 turbines), operated by RWE Npower Renewables, and lies 20 km SW of the Project Site;
- The Gwynt y Môr offshore wind farm (576 MW, 160 turbines), operated by RWE Npower Renewables, is located approximately 8 km W of the Project Site, and is currently under construction.

23.6.28 In addition, the proposed Irish Sea Round 3 'Celtic Array' Zone (being developed by Centrica and DONG Energy) is located immediately northwest of the main study area. At its closest point, the Celtic Array Rhiannon offshore wind farm project, at which construction is scheduled to commence in 2017, is located 42 km west northwest of the Project Site. At its closest point, the Celtic Array north east offshore wind farm project, at which construction is scheduled to commence in 2018, is located 55 km northwest of the Project Site.

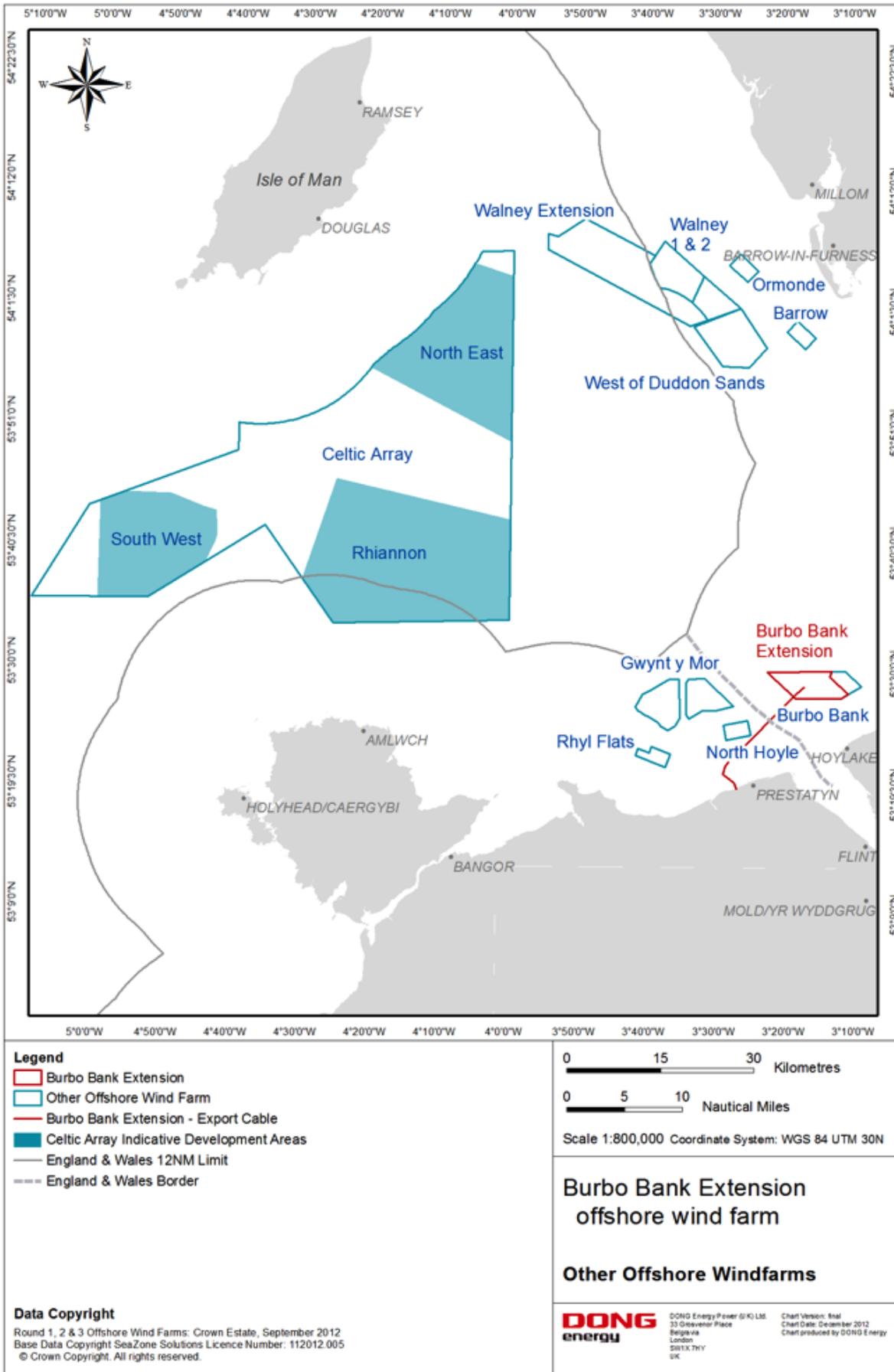


Figure 23.7: Offshore wind farms in the vicinity of the Project

### Aggregate extraction and maintenance dredging

23.6.29 Aggregate extraction occurs within the study area. The shipping and navigation aspects relating to this receptor are covered in ES Chapter 17 'Shipping and Navigation'. The following aggregate extraction areas are located within the study area (see Figure 23.8):

- Licenced Dredging Area 392/393 is located 4 km southwest of the Project Site and, at its closest point, approximately 1.4 km northwest of the Offshore Cable Route. The portion of this Licenced Dredging Area located within Welsh territorial waters is classified as Application Area 392/393. Active Dredge Area 392/393, which was licenced in January 1991, is located within the SE corner of the Licenced Dredging Area. It covers an area of approximately 2 km<sup>2</sup> and is currently licenced by The Crown Estate to Norwest Sand and Ballast Co. Ltd, and Tarmac Marine Dredging Ltd. The current licence for Active Dredge Area 392/393 is due to expire on 31<sup>st</sup> December 2013. An application for a longer term marine licence is currently in progress, seeking permission from Welsh Government to dredge in the locality for a further 15 years beyond 2013. Dredging activities are restricted to within the Active Dredge Area, while anchoring occurs within the wider Licenced Dredging Area.
- Licenced Dredging Area 457 is located 12 km northwest of the Project Site and is licenced to Westminster Gravels Ltd. Active Dredge Area 457, which is wholly contained within Licenced Dredging Area 457, is split in two.
- A new aggregate resource block, located 1 km west of the Project Site, is currently being considered by The Crown Estate for a licensing round. Activity at this site may commence in 2016.

23.6.30 Maintenance dredging is carried out in order to maintain (or deepen) access channels at the entrances to ports. As detailed in ES Chapter 17 'Shipping and Navigation' dredging activities occurring within the study area take place in the Mersey and along the channel approach to the Port of Mostyn. The dredging activities of the Port of Mostyn have influenced the positioning of the Offshore Cable Route (see ES Chapter 5 'Site Selection and Alternatives').

### Waste disposal sites

23.6.31 Since 1994, the dumping at sea of most forms of industrial waste has been prohibited, with the disposal of sewage sludge phased-out in 1998. Dredged waste excavated from ports and navigation channels now forms the majority of the remaining material eligible for disposal at sea. This is discussed in the ES Chapter 17 'Shipping and Navigation'.

23.6.32 Activities relating to the disposal of dredged spoil, sewage sludge, sewage, and unexploded ordnance (UXO) within the study area are outlined below:

- Disposal sites: six open disposal sites, used for the disposal of maintenance and capital dredge spoil, have been identified within the study area. The Mostyn Deep licenced disposal site (IS102), located approximately 2 km northeast from the Point of Ayr (29 km S of the Project Site), receives spoil from the maintenance dredging activity occurring within the vicinity of the Welsh Channel, required in order to maintain access to the Port of Mostyn. No records of this site being used for disposal within the last year or two were produced by the MMO. Disposal Site Z (IS140), located approximately 15 km N of the Project Site, receives spoil from the maintenance dredging activity required in order to maintain access to the Port of Liverpool. A total of 1,890,343 tonnes of material were disposed of at Site Z between January 2011 and June 2012. Disposal Site Y (IS150), located approximately 20 km NW of the Project Site, receives capital dredge spoil from the Port of Mostyn and the

Port of Liverpool. A total of 8,940 tonnes of material were disposed of at Site Y between July and December 2011. See Figure 23.8 for location of Sites IS102, IS140 and IS150. The remaining three open spoil disposal sites present within the study area, IS120, IS110, and IS128, are located within the Mersey estuary and received 288,830 tonnes (August 2011 to March 2012), 148,461 tonnes (February to June 2011), and 49,789 tonnes (October 2011 to May 2012) respectively. One disused spoil disposal site, and 15 closed spoil disposal sites, are also located within the study area;

- Disused sewage sludge dumping areas: two areas, IS070 and IS071, are located within the study area and were closed in 1995 and 1998 respectively;
- Sewage outfalls: a number of sewage outfall pipes are located along the coastal strip within the study area (see Figure 23.8). The closest to the Project Site extends approximately 5 km NNW from the shore of north Wirral terminating approximately 2 km from the southern extent of the Project Site. Four sewage outfall pipes, ranging in length from approximately 500 m to 4 km, extend out to sea from the coast within the vicinity of Rhyl and Prestatyn;
- UXO or munitions dump sites: none have been identified within the study area. UXO sites are considered to be a safety issue, rather than an environmental consideration, and will be assessed ahead of all relevant operational activities. As such, this Environmental Statement does not present an environmental or cumulative impact assessment for UXO.

### Underground coal gasification (UCG)

23.6.33 The concept of UCG is based around injecting gases (air/oxygen, and/or steam) into buried coal seams in order to initiate the partial in-situ combustion of the coal, and the subsequent extraction of syngas that can be used as either a feedstock material, or for power generation. The worldwide application of UCG technology is, at present, limited to a single onshore production facility and a number of pilot projects. UCG has, to date, never been applied offshore.

23.6.34 In 2009 and 2010 TCA received applications for, and granted, 14 conditional near-shore UCG licences to companies looking to develop this resource. These conditional licences, which have a maximum size of 100 km<sup>2</sup>, enable prospective operators to secure the rights to the coal while project details are developed, but do not permit UCG operations to commence until all other rights and permissions are in place. The UCG licences package is comprised of a Conditional UCG licence, an Option for Lease, and an Exploration licence.

23.6.35 In April 2010 TCA awarded Conditional UCG Licence Area CA11/UCG/0011/S to Riverside Energy (Liverpool) Ltd. The initial term of the licence expires in April 2013, at which point, it can be extended by agreement, subject to the holder satisfying TCA of the intent to carry on with the project, evidence of substantive progress made, and continuing financial ability to support the project.

23.6.36 At present, the type of offshore activities and infrastructure that might potentially be required to develop UCG licence areas is not well defined. Where possible, it will generally be cheaper to locate and operate facilities onshore. However, it remains possible that, at some point in the future, the following facilities may feature within UCG Licence Area CA11/UCG/0011/S: fit-for-purpose low-cost drilling rigs, small low-cost fixed platforms, well heads, and pipelines.

23.6.37 As shown in Figure 23.8, the current spatial extent of Conditional UCG Licence Area CA11/UCG/0011/S overlaps with the middle section of the Project Site. However, subsequent to discussions led by the Applicant, with Riverside Energy, TCA and The Crown Estate, TCA have confirmed in a written letter that, if in 2013 Riverside Energy apply for an extension to their conditional UCG licence, the spatial extent of the UCG Licence Area will be decreased, such that there is no longer a spatial overlap between the UCG Licence Area and the Project Site, and that an agreed safety buffer is in place between the two.

23.6.38 Issues relating to the potential for subsidence, resulting from UCG activity, would need to be addressed ahead of any development of the UCG Licence Area.

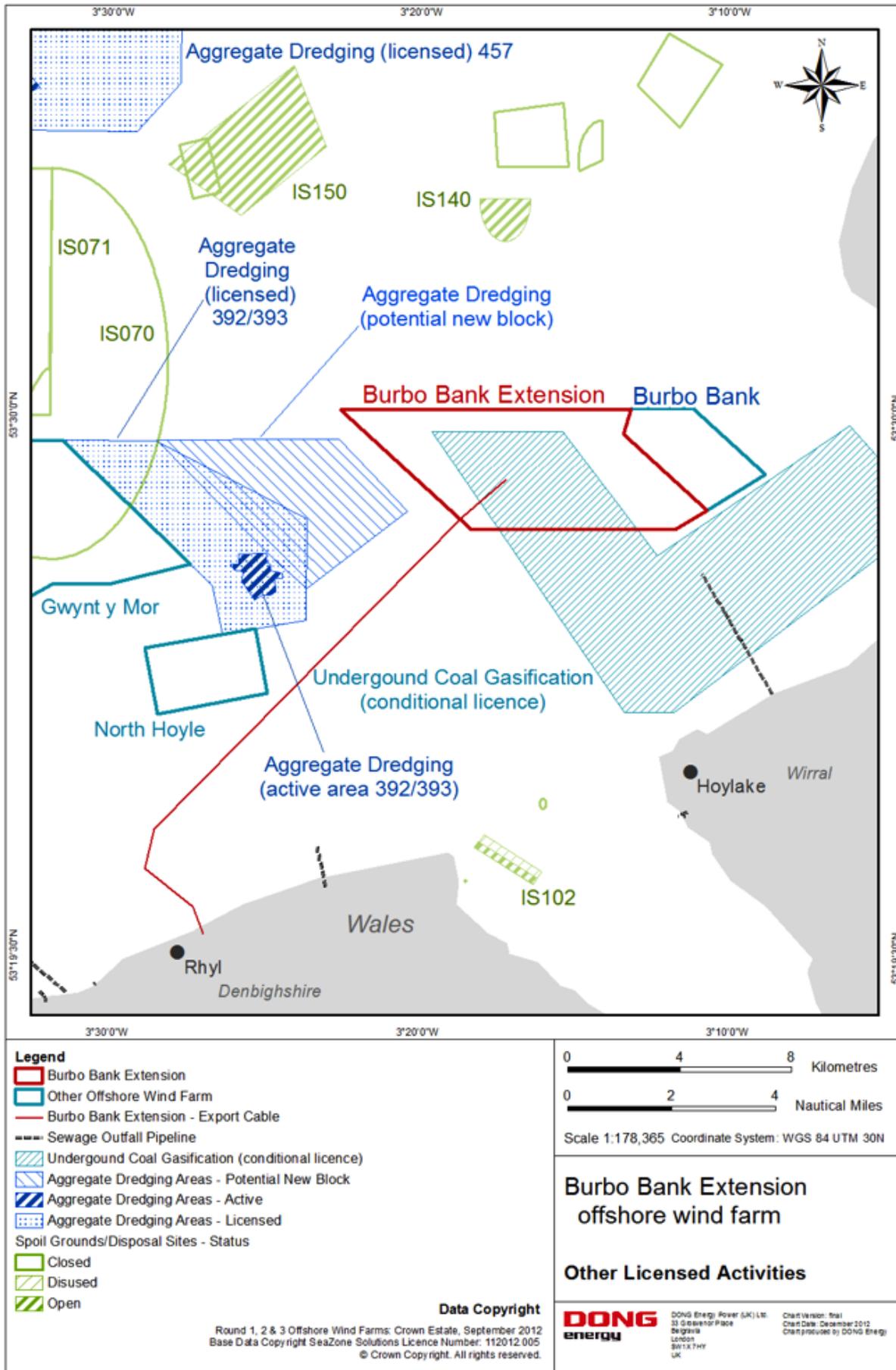


Figure 23.8: Other licensed activities

## 23.7 Key Parameters for Assessment

23.7.1 The impact assessment methodology utilised within this chapter is based upon a consideration of the Design Envelope approach, whereby the Project parameters' considered for assessment are based on the maximum adverse scenario, as listed in Table 23.4. The assessment is made over the three main phases of the Projects lifetime, i.e. construction, operation and decommissioning.

23.7.2 The physical presence of various offshore vessels associated with the construction, operation and decommissioning of the Project (including jack-up barges, tugs, and anchor handlers, as well as a range of heavy lift, cable-lay, crew transfer, guard, supply, maintenance, service, rock dump, dredge, and spoil disposal vessels) coupled with the Project's offshore infrastructure itself (wind turbines, foundations, offshore substation and cables) may, to varying degrees, impact the access of other operators to their existing, or currently proposed, infrastructure, and/or licenced areas that are located within the study area. In this regard, potential impacts, originating from the Project, that may potentially affect transiting vessels and helicopters, are assessed separately in ES Chapter 17 'Shipping and Navigation', and ES Chapter 22 'Helicopter Access to Oil and Gas Platforms' respectively. ES Chapter 17 'Shipping and Navigation' also incorporates an assessment of port infrastructure and anchorage areas.

23.7.3 Other offshore licenced or commercial activities (including commercial fishing operations, and a small number of offshore businesses based around tourism and recreation) that utilise the study area, are also assessed separately in ES Chapter 18 'Commercial Fisheries' and ES Chapter 33 'Socio-Economic Impact Assessment respectively'.

23.7.4 The EIA process is primarily used as a tool for assessing the potential impacts that might occur as a result of planned operations. Unplanned, potentially high impact, emergency incidents, such as the unlikely event of the Project's cable-lay activities leading to a gas export pipeline being compromised, could potentially have a direct, and significant, effect upon some of the offshore receptors covered by this chapter. However, an assessment of the impacts of highly-improbable unplanned events is not incorporated within the overall EIA process.

23.7.5 As described in Section 23.3, Riverside Energy raised an objection to the Project in 2012 based on the overlap between Riverside Energy's conditional UCG licence area and the Project Site. Subsequently, TCA confirmed that, if an extension to the term of the UCG licence is sought in 2013, the UCG licence area will be reduced such that any overlap with the currently agreed position of the Project's site boundary is removed, and a safety buffer zone is introduced (the width of the latter remains undefined at the time of writing). As such, impacts associated with a direct overlap between the UCG licence area and the Project Site will not arise, and have thus been scoped out of the EIA.

*Table 23.4: Design envelope scenario considered for the assessment of potential impacts on Other Infrastructure and Licensed Activities.*

Potential impact	Maximum adverse scenario	Justification
Construction phase		
Construction vessel traffic, transiting to, and from, the Project, interferes with the activities of the other sea-users identified within this chapter.	Movement of maximum number of vessels (up to 3,650 return trips to/from the Project Site per annum).	Will lead to the greatest level of potential interference with the activities of the other sea-users.
Seabed sediment redistributed to, and deposited at, licensed aggregate extraction areas.	Installation of largest number of turbines (69), using gravity base structure foundations.	Will lead to greatest volume of sediment redistribution, caused by sediment disturbance and concomitant sediment transport.
Airborne construction noise increases noise exposure for offshore personnel responsible for operating Other Infrastructure and Licensed Activities.	Installation of maximum number of turbines (69), using maximum diameter monopile foundations (8 m), and therefore maximum pile driving hammer energy (2,700 kJ).	Will result in the maximum duration of noise disturbance.
Subsea piling noise interferes with oil and gas seismic surveys.	Installation of maximum number of turbines (69), using maximum diameter monopile foundations (8 m), and therefore maximum pile driving hammer energy (2,700 kJ).	Will result in the maximum level of noise propagation.
The Project's export cable-lay operations interfere with oil and gas operations when the cable is laid across licensed Blocks.	Laying of maximum number of export cables (2)	Will result in cable-lay vessel spending more time crossing Licence Blocks.

Table 23.4: continued

Potential impact	Maximum adverse scenario	Justification
Operation phase		
Operation, maintenance and repair-vessel traffic transiting to, and from, the Project, interferes with the activities of the other sea-users identified within this chapter.	Movement of maximum number of vessels (up to 2,190 return trips to/from the Project Site per annum). Extra vessels may be required during one off repair campaigns.	Will lead to the greatest level of potential interference with the activities of the other sea-users.
Scour leads to seabed sediment being redistributed to, and deposited at, licensed aggregate extraction areas.	Installation of maximum number of turbines (69), with gravity base structure foundations, and no scour protection.	Will lead to greatest volume of sediment redistribution, caused by sediment disturbance and concomitant sediment transport.
Physical presence of wind turbines prevents, or impedes, oil and gas developers acquiring further seismic survey data.	Installation of maximum number of turbines (69) with jacket foundations.	Will prohibit seismic survey vessels accessing greatest area of sea surface.
Physical presence of the wind turbines causes a wake-loss effect on the Gwynt y Môr offshore wind farm	Maximum installed capacity (258 MW).	Roughly speaking, wake loss will be a function of the wind farm power density (MW/km <sup>2</sup> ), rather than the relative mix of the three main contributing factors, i.e. the density of the wind farm, the rotor diameter, and the individual wind turbine capacity.
The crossing structures required as a result of the installation of the Project's export cable impacts repair of existing cables and pipelines	Laying of maximum number of export cables (2) at the minimum agreed crossing angle (tbc).	Will result in the maximum area of cover over existing cable/pipeline.

Table 23.4: continued

Potential impact	Maximum adverse scenario	Justification
Decommissioning phase		
Decommissioning vessel traffic, transiting to, and from, the Project, interferes with the activities of the other sea-users identified within this chapter.	Installation of maximum number of turbines (69).	Will require greatest number of vessel traffic movements.

## 23.8 Assessment Criteria and Assignment of Significance

23.8.1 This section describes the criteria applied in this chapter to assign values to the sensitivity of receptors, and the magnitude of potential impacts. The methodology follows that set out in ES Chapter 3 ‘Environmental Impact Assessment Process’.

23.8.2 Table 23.5 and Table 23.6 below present the Design Manual for Roads and Bridges (DMRB) definition of sensitivity and magnitude respectively. The topic-specific criteria, used to describe sensitivity and magnitude in this chapter, have been derived using professional judgement, based on specialist experience relevant to the receptors covered within this chapter, and are presented alongside the DMRB definitions.

The criteria for sensitivity used in this chapter are outlined in Table 23.5 below.

Table 23.5: Environmental value (Sensitivity)

Value (Sensitivity)	DMRB description	Criteria used in this chapter
Very High	Very high importance and rarity, international scale and very limited potential for substitution	Internationally significant resource, with very limited potential for substitution
High	High importance and rarity, national scale and limited potential for substitution	Nationally significant resource, with limited potential for substitution
Medium	High or medium importance and rarity, regional scale, limited potential for substitution	Regionally significant resource, with medium potential for substitution
Low (or lower)	Low or medium importance and rarity, local scale	Locally significant resource, with high potential for substitution
Negligible	Very low importance and rarity, local scale	Minimally significant resource, with very high potential for substitution

The criteria for magnitude used in this chapter are outlined in Table 23.6 below

Table 23.6: Magnitude of environmental impacts

Magnitude of impact	Description	Criteria used in this chapter
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse)	Permanent or long term cessation of operation or production, or complete loss of resource and/or quality and integrity of resource
	Large scale or major improvement or resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial)	N/a
Moderate	Loss of resource, but not adversely affecting integrity of resource; partial loss of/damage to key characteristics, features or elements (Adverse)	Intermittent, or medium-term, cessation of operation, or significant reduction of production, or partial loss of resource and/or quality and integrity of resource
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial)	N/a
Minor	Some measureable change in attributes, quality or vulnerability, minor loss or, or alteration to, one (maybe more) key characteristics, features or elements (Adverse)	Short-term cessation of operation, or minor decrease in production, or minor loss of resource and/or quality and integrity of resource
	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)	N//a

Table 23.6: continued

Magnitude of impact	Description	Criteria used in this chapter
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse)	Minimal, or one-off, cessation of operation, or very minor decrease in production, or very minor loss of resource and/or quality and integrity of resource
	Very minor benefit to, or positive addition of one or more characteristics, features or elements (Beneficial)	N/a
No change	No loss or alteration or characteristics, features or elements; no observable impact in either direction	No alteration of operation, production, resource, resource quality, or resource integrity

## 23.9 Assessment of Significance

### Mitigation Measures Adopted as Part of the Project

#### *Pipeline and cable crossings*

23.9.1 As detailed in Section 23.6 (Infrastructure and other facilities), the Project's export cable is likely to physically cross three adjacent pipelines utilised by the oil and gas industry, as well as two High Voltage Direct Current (HVDC) interconnector cables. The Project's export cable will also be laid within close proximity to the North Hoyle offshore wind farm's export cable. If poorly managed, activities associated with laying or repairing the Project's export cable, that occur within the vicinity of the various crossing/proximity points, have the potential to cause significant damage to existing pipelines or cables. An impact of major magnitude such as this, could lead to an effect of very large significance that may present both safety and pollution/contamination hazards, as well as asset production loss.

23.9.2 In order to mitigate against these risks, standard industry best practice will be followed, that will include installing the Project's export cable across existing pipelines and cables with the required level of protection/burial, at a suitable crossing angle, avoiding cathodic protection on pipelines, and allowing for the safe retrieval of underlying cables to surface, and for safe access to pipelines. Following further consultation, Crossing/Proximity Agreements will be entered into with the relevant stakeholders and executed prior to the start of the construction phase. The relevant policies, documents and guidelines issued by Subsea Cables UK (SCUK) and the International Cable Protection Committee (ICPC) will be used as a basis for discussion ahead of, and in conjunction with, any crossing, or proximity, requirement. Construction traffic associated with the Project will be vetted prior to selection, and issued with written procedures to ensure they do not anchor, or carry out any major lifting operations over, or near, existing cables.

23.9.3 It is considered that the implementation of the ‘built in’ mitigation measures described above will reduce the potential for an incident that could compromise the integrity of one of the pipelines, or cables, to a level that is As Low As Reasonably Practicable (ALARP). The impacts of unplanned emergency incidents such as these have been scoped-out, and are not subject to further assessment as part of the overall EIA process.

### ***Implementation of standard maritime good practice***

23.9.4 A range of vessels will transit to, within, and from the Project Site and the Offshore Cable Route. These vessels will include some, or all, of the following: jack-up barges, heavy lift vessels, cable-lay vessels, tugs, anchor handlers, crew transfer vessels, guard vessels, supply vessels, operation and maintenance vessels, emergency response and rescue vessels, rock dump vessels, dredging vessels, and spoil disposal vessels. These vessels will transit in compliance with standard maritime good practice both, across the subsea infrastructure and other licenced activities, and around the above sea offshore infrastructure, identified in Section 23.6. For these vessels, the mitigation steps required to ensure the implementation and enforcement of standard maritime good practice is deemed to be ‘built-in’ and further details are provided in ES Chapter 17 ‘Shipping and Navigation’.

### ***Liaison and consultation***

23.9.5 Since November 2010 the key form of ‘built-in’ mitigation adopted by the Applicant, with a view to resolving any issues of concern, has been to engage in active and early consultation with the owners and operators of the Other Infrastructure and Licensed Activities identified within the study area. As outlined below, liaison with each of these operators remains on-going and will continue, as required, throughout the Project lifecycle.

23.9.6 Where appropriate, the Applicant will seek to establish written agreements, including letters of no objection, agreements in principle, heads of terms, and pipeline and cable crossing and proximity agreements. Where written agreements covering areas of potential conflict cannot be reached, statements of common ground will be sought with relevant parties.

23.9.7 The Applicant will keep a watching brief over the outcome of the 27<sup>th</sup> Round offshore oil and gas licensing round and will continue to liaise with the oil and gas operators identified within this chapter.

23.9.8 The Applicant will continue to consult with the operator of the North Hoyle offshore wind farm export cable and the developers of the two proposed HVDC interconnector cables identified within this chapter.

23.9.9 The Applicant maintains close contact with the operators and developers of the other wind farms located within the study area, and attends, as DONG Energy, the Irish Sea Developers Working Group run by The Crown Estate, and the east Irish Sea Development Group that numerous developers, advisors and regulatory bodies also attend.

23.9.10 The Applicant will continue to engage with the operators and owners of nearby aggregate extraction assets. The Applicant has held a number of meetings with the operator of Licenced Dredging Area 392/393, who attended two of the Navigational Working Group meetings held in 2011 at the Port of Liverpool.

23.9.11 The Applicant will continue to engage with the users of nearby licenced disposal sites such as the Port of Liverpool and the Port of Mostyn.

23.9.12 The development of Conditional UCG Licence Area CA11/UCG/0011/S is at a relatively early stage, and it is considered unlikely that development activity will occur ahead of construction activity associated with the Project. Nevertheless, the Applicant will continue to maintain a liaison with both the licence holder and TCA.

23.9.13 Under the auspices of the Marine Policy Statement, the MMO and the Welsh Assembly Government will seek to implement the principles of Marine Spatial Planning in English and Welsh waters respectively. With a view to mitigating potential cumulative and interactive effects upon existing and proposed developments within the study area, the Applicant will continue to engage in active and constructive dialogue with government authorities seeking to implement Marine Spatial Planning processes. Where appropriate, and with the same objective in mind, this approach will also be applied to DECC's on-going Strategic Environmental Assessment (SEA) process and overall support legislation geared to sustainable use of the marine environment.

23.9.14 Additionally, the Applicant will consult with The Crown Estate and, where required, apply for the necessary Small Works Licences, to ensure any potential conflicts in the area are addressed. This process has been undertaken for preliminary survey work in the pre-application phase.

### **Construction Phase**

23.9.15 The impacts of the construction of the Project on Other Infrastructure and Licensed Activities have been assessed in the offshore study area. The environmental effects arising from the construction of the Project are listed in Table 23.4 above along with the Design Envelope criteria against which each construction phase impact has been assessed.

23.9.16 A description of the potential interactions between the receptors associated with Other Infrastructure and Licensed Activities, and each identified impact, is given below. In general however, the environmental effects arising from the construction of the Project are temporary, as they only occur during the construction phase and encompass the effects associated with turbine foundation and cable installation.

### ***Construction vessel traffic, transiting to, within, and from, the Project interferes with the activities of other sea-users***

23.9.17 During the construction phase, a range of vessels will transit to, within, and from the Project Site and the Offshore Cable Route. These vessels will include some, or all, of the following: jack-up barges, heavy lift vessels, cable-lay vessels, tugs, anchor handlers, crew transfer vessels, guard vessels, supply vessels, emergency response and rescue vessels, rock dump vessels, dredging vessels, and spoil disposal vessels. During the construction phase, the movement of up to 3,650 return vessel trips to/from the Project Site may take place per annum.

23.9.18 These vessels will transit both, across the subsea infrastructure and other licenced activities, and around the above-sea offshore infrastructure, identified in section 23.6. The construction vessel traffic associated with the Project has the potential to interfere with the on going activities of the existing offshore operators covered by this chapter.

### *Likely environmental effects without mitigation*

23.9.19 The potential impacts associated with an increased level of marine traffic will be direct, e.g. physical obstruction, queuing, occupation of berths, anchorages, etc. The potential impacts associated with an increased requirement for marine vessels may be indirect, e.g. increased competition for, and therefore potentially reduced access to, charter vessels.

23.9.20 Overall, it is predicted that the potential impacts could be both direct and indirect, and of an intermittent nature, and of medium duration. The sensitivity of the receptors covered by this subsection is considered to be **medium** and the magnitude is deemed to be **negligible**. The effect will, therefore, be of **slight** adverse significance, which is not significant in EIA terms.

### *Further mitigation and future monitoring*

23.9.21 No further mitigation is required and a formal monitoring programme is not applicable for the **slight** adverse effect described in this section.

### ***Seabed sediment redistributed to, and deposited at, licensed aggregate extraction areas***

23.9.22 The deposition of significant volumes of unwanted foreign material, such as seabed sediment, within licensed aggregate extraction areas could potentially impact the quality of the aggregate resource.

23.9.23 As discussed in ES Chapter 10 'MetOcean and Coastal Processes', construction activities at both the Project Site, and along the cable route, will lead to the disturbance and localised redistribution of some seabed sediments. The overall level of sediment transport is expected to be similar in nature and scale to that caused by other nearby offshore licensed activities, such as the construction and installation of oil and gas facilities, and the undertaking of aggregate extraction, dredging, and spoil disposal operations. Furthermore, it is considered that the overall level of any sediment transport caused by the Project will be insignificant in relation to naturally occurring bedload movements and storm induced increases in suspended sediment concentrations.

23.9.24 The nearby aggregate extraction operations are located to the west and northwest of the Project, i.e. in the opposite direction to that of the net sediment bedload transport identified in ES Annex '5.1.5.10.1'.

23.9.25 Any vessel-based movement, storage, or disposal, of seabed sediment that is removed from the seabed in preparation for the installation of gravity base structure foundations, will be managed in such a way that no significant volumes of seabed sediment are deposited within licensed aggregate extraction areas.

### *Likely environmental effects without mitigation*

23.9.26 Overall, it is predicted that the potential impact could be direct, of an intermittent nature, and of medium duration. The sensitivity of the receptor covered by this subsection is considered to be **medium** and the magnitude is deemed to be **negligible**. The effect will, therefore, be of **slight** adverse significance, which is not significant in EIA terms.

### *Further mitigation and future monitoring*

23.9.27 No further mitigation is required and a formal monitoring programme is not applicable for the **slight** adverse effect described in this section.

### ***Airborne construction noise increases noise exposure for offshore personnel operating Other Infrastructure and Licenced Activities***

23.9.28 As discussed in ES Chapter 11 'Offshore Noise', the proposed construction activities will generate varying levels of airborne noise. High levels of airborne noise could potentially impact nearby offshore workers deployed on vessels mobilised to service the Other Infrastructure and Licenced Activities identified within this chapter. 500 m safety exclusion zones will be enforced around the primary installation vessels during the construction phase. As such, a minimum distance of 500 m will separate any offshore workers servicing the Other Infrastructure and Licenced Activities identified within this chapter from the sources of airborne construction noise generated by the Project.

#### ***Likely environmental effects without mitigation***

23.9.29 Overall, it is predicted that the potential impact could be direct, of an intermittent nature, and of medium duration. The sensitivity of the receptor covered by this subsection is considered to be **medium** and the magnitude is deemed to be **no change**. The effect will, therefore, be **neutral**, which is not significant in EIA terms.

#### ***Further mitigation and future monitoring***

23.9.30 No further mitigation is required and a formal monitoring programme is not applicable for the **neutral** effect described in this section.

### ***Subsea piling noise interferes with oil and gas seismic surveys***

23.9.31 In the unlikely event that both, digital seismic acquisition operations associated with oil and gas development, and piling activity required in conjunction with the construction of the Project, are scheduled concurrently and in close proximity, the underwater noise generated by the latter has the potential to impact on the former.

23.9.32 The propagation of piling noise, and therefore its potential to interfere with seismic acquisition, will be influenced by the hardness of the shallow sub-surface geology around the piling site. The shallow sub-surface geology at the Project Site comprises surface sands, sand, gravelly clays, cobbles and boulders, sandy to gravelly clay with beds of sand and boulders, and the Mercia Mudstone Group, as described in ES Chapter 8 'Geology, Bathymetry and Seabed Features'. Interference can be expected to occur over distances of up to 50 km in instances where the sub-surface geology surrounding the piling site comprises hard rock. However, this radius of potential influence, is expected to be significantly reduced as a result of the relatively soft sub-surface geology encountered at, and in all likelihood around, the Project Site.

#### ***Likely environmental effects without mitigation***

23.9.33 Overall, it is predicted that the potential impact could be direct, of an intermittent nature, and of medium duration. The sensitivity of the receptor covered by this subsection is considered to be **medium** and the magnitude is deemed to be **moderate**. The effect will, therefore, be **moderate**, which is significant in EIA terms.

### *Further mitigation and future monitoring*

23.9.34 In many instances it is possible for a party acquiring seismic data to screen out interference, caused by e.g. piling noise, or vessel noise, from seismic data-sets during data processing. Furthermore, it is significantly easier to screen out the noise signal generated by piling activity from seismic data-sets that have been acquired while the source vessel is travelling away from the source of the piling noise. As such, it may be possible to coordinate the timing of piling activity and seismic acquisition in order to minimise any potential interference.

23.9.35 In line with the general 'built-in' mitigation measures, based around consultation and liaison, that will be adopted as part of the Project and are described in Section 23.9 (Liaison and consultation), the Applicant will maintain an on going liaison with oil and gas operators active within the Study Area. This will facilitate early and effective forward planning, that will minimise the potential for a disruptive schedule-clash and enhance the opportunity for cooperation and coexistence.

23.9.36 It is considered that the implementation of the mitigation described above will reduce the magnitude of this potential impact to **minor**. The residual effect will, therefore, be reduced to **slight**, which is not significant in EIA terms.

23.9.37 A formal monitoring programme is not applicable for the residual **slight** adverse effect described in this section.

### ***The Project's export cable-lay operations interfere with oil and gas operations when the cable is laid across licensed Blocks***

23.9.38 As discussed in Section 23.6 (Licence Blocks), the Offshore Cable Route crosses the Point of Ayr Licence Blocks 110/18a and 110/19a. In the event that the licence holder of these Blocks opts to identify, appraise or develop prospects located therein using offshore technology and infrastructure (rather than onshore technology) simultaneously with the installation of the Project's export cable, the process of laying the cable, and the cable-lay vessel itself, could potentially present a barrier to access for seismic vessels, jack-up rigs, or construction vessels.

### *Likely environmental effects without mitigation*

23.9.39 Overall, it is predicted that the potential impact could be direct, of a permanent nature, and of short duration. The sensitivity of the receptor covered by this subsection is considered to be **medium** and the magnitude is deemed to be **moderate**. In the unlikely event that it occurs, the effect will, therefore, be **moderate**, which is significant in EIA terms.

### *Further mitigation and future monitoring*

23.9.40 In line with the general 'built-in' mitigation measures, based around consultation and liaison, that will be adopted as part of the Project and are described in Section 23.9 (Liaison and consultation), the Applicant will maintain an on going liaison with the operator of the Point of Ayr Licence Blocks. This will facilitate early and effective forward planning, that will minimise the potential for a disruptive schedule-clash and enhance the opportunity for cooperation and coexistence. It is considered that the implementation of this mitigation will reduce the magnitude of this potential impact to **minor**. The residual effect will, therefore, be reduced to **slight**, which is not significant in EIA terms.

23.9.41 A formal monitoring programme is not applicable for the residual **slight** adverse effect described in this section.

### Operational and Maintenance Phase

23.9.42 The impacts of the operation and maintenance phase of the Project on Other Infrastructure and Licensed Activities have been assessed in the offshore study area. The environmental effects arising from the operation and maintenance of the Project are listed in Table 23.4 above along with the Design Envelope criteria against which each construction phase impact has been assessed.

23.9.43 A description of the potential interactions between the receptors associated with Other Infrastructure and Licensed Activities, and each identified impact, is given below.

#### ***Operation, maintenance and repair vessel traffic transiting to, and from, the Project, interferes with other sea-users***

23.9.44 During the operation and maintenance phase a range of vessels will transit to, within, and from, the Project Site and the Offshore Cable Route. These vessels will routinely include crew transfer vessels, and supply vessels, but may on occasion also include some, or all, of the following: jack-up barges, heavy lift vessels, cable lay vessels, tugs, anchor handlers, guard vessels, and emergency response and rescue vessels. During the operational and maintenance phase, the movement of up to 2,190 return vessel trips to/from the Project Site may take place per annum in order to support routine operation and maintenance activity. In addition to this, extra vessels may be required during one off repair campaigns.

23.9.45 These vessels will transit both, across the subsea infrastructure and other licensed activities, and around the above-sea offshore infrastructure, identified in Section 23.6. The vessel traffic required by the Project, has the potential to interfere with the on-going activities of the existing offshore operators covered by this chapter.

#### ***Likely environmental effects without mitigation***

23.9.46 The potential impacts associated with an increased level of marine traffic will be direct, e.g. physical obstruction, queuing, occupation of berths, anchorages, etc.. The potential impacts associated with an increased requirement for marine vessels may be indirect, e.g. increased competition for, and therefore a potential reduction in the availability of, charter vessels for the other sea-users identified within this chapter.

23.9.47 Overall, it is predicted that the potential impacts could be both direct and indirect, of a continuous nature, and of medium duration. The sensitivity of the receptors covered by this subsection is considered to be **medium** and the magnitude is deemed to be **minor**. The effect will, therefore, be of **slight** adverse significance, which is not significant in EIA terms.

#### ***Further mitigation and future monitoring***

23.9.48 No further mitigation is required and a formal monitoring programme is not applicable for the **slight** adverse effect described in this section.

#### ***Scour leads to seabed sediment being redistributed to, and deposited at, licensed aggregate extraction areas***

23.9.49 As discussed in ES Chapter 10 'MetOcean and Coastal Processes', localised scour may be a feature around the wind turbine foundation structures, as well as around potential areas of cable protection (rock dumping, mattressing, etc.). The latter may be necessary if surface, or near-surface, cable-laying is required due to unsuccessful cable burial.

23.9.50 The area affected by any changes will be small compared to the entire area of the Project Site, and significant effects are not expected beyond the perimeter of the Project Site. It is considered that the overall level of any sediment transport will be insignificant in relation to naturally occurring bedload movements and storm induced increases in suspended sediment concentrations.

23.9.51 The nearby aggregate extraction operations are located to the west and northwest of the Project, i.e. in the opposite direction to that of the net sediment bedload transport identified in ES Annex '5.1.5.10.1'.

#### *Likely environmental effects*

23.9.52 Overall, it is predicted that the potential impacts could be direct, of an intermittent nature, and of medium duration. The sensitivity of the receptor covered by this subsection is considered to be **medium** and the magnitude is deemed to be **no change**. The effect will, therefore, be **neutral**, which is not significant in EIA terms.

#### *Further mitigation and future monitoring*

23.9.53 No further mitigation is required and a formal monitoring programme is not applicable for the **neutral** effect described in this section.

#### ***Physical presence of wind turbines prevents, or impedes, oil and gas developers acquiring further seismic survey data***

23.9.54 The oil and gas industry has previously acquired exploratory 2D and 3D seismic data across the majority of the study area, including at the Project Site. None of the other commercial sea-users covered within this chapter have established a specific and recent interest in, or claim to, the area of seabed or water-column that is delineated by the boundary of the Project Site. For this reason, only the potential future interest of the oil and gas industry is considered further.

23.9.55 The presence of the Project's wind turbine array may present a physical barrier, that could preclude the oil and gas industry from using conventional towed-array methodology to acquire additional 2D and 3D seismic data across the Project Site. Elsewhere in the Irish Sea, the acquisition of high-resolution digital data (which uses shorter and therefore more manoeuvrable towed seismic arrays) has been proposed as a means for permitting oil and gas exploration activities to continue above prospects that are now located partly, or fully, beneath the boundary of existing operational wind farms.

23.9.56 Factors that have been taken into consideration when assessing this potential impact include the localised geographical extent of the Project Site, in comparison to the remaining potential for oil and gas development across the wider Liverpool Bay area, and the relatively mature stage of oil and gas development within the Liverpool Bay area.

#### *Likely environmental effects*

23.9.57 Overall, it is predicted that the potential impacts could be direct, of a continuous nature, and of long-term duration. The sensitivity of the receptor covered by this subsection is considered to be medium and the magnitude is deemed to be minor. The effect will, therefore, be of slight adverse significance, which is not significant in EIA terms.

*Further mitigation and future monitoring*

23.9.58 No further mitigation is required and a formal monitoring programme is not applicable for the **slight** adverse effect described in this section.

***Physical presence of the wind turbines causes a wake-loss effect on the Gwynt y Môr offshore wind farm***

23.9.59 RWE npower renewables raised a concern that, due to the size of the Project and its proximity to the Gwynt y Môr offshore wind farm, the potential exists for the Project to cause a “wake” effect on the Gwynt y Môr project that reduces the wind resource available.

23.9.60 In response to this concern, the Applicant undertook a quantitative wake loss assessment. The study concluded that the cumulative impact of wind turbine wakes caused by the Project and the existing Burbo Bank offshore wind farm on the energy production of the Gwynt y Môr offshore wind farm is below less than a tenth of a percent and that, as such, it is extremely unlikely that the impact will be measureable. RWE npower renewables have reviewed the study and accepted the conclusion that any wake loss effect is hence considered to be statistically undeterminable in any future analysis of production data.

*Likely environmental effects*

23.9.61 Overall, it is predicted that the potential impacts could be direct, of a continuous nature, and of long-term duration. The sensitivity of the receptor covered by this subsection is considered to be **medium** and the magnitude is deemed to be **negligible**. The effect will, therefore, be of **neutral** significance, which is not significant in EIA terms.

*Further mitigation and future monitoring*

23.9.62 No further mitigation is required and a formal monitoring programme is not applicable for the **neutral** effect described in this section.

***The crossing structures required as a result of the installation of the Project's export cable impacts repair of existing cables and pipelines***

23.9.63 The potential for unplanned incidents, occurring as a result of the installation of the Project's export cable over existing cables and pipelines is discussed in Section 23.9 (Pipeline and cable crossings), where it is scoped out in terms of further consideration within the EIA process. The potential impacts upon existing pipelines and cables, associated with the ongoing presence of crossing points and, where required, crossing structures, is considered within this subsection.

23.9.64 As detailed in Section 23.6 (Infrastructure and other facilities), the Project's export cable is likely to physically cross three adjacent pipelines utilised by the oil and gas industry, as well as two HVDC interconnector cables. As described in ES Chapter 6 'Project Description', the cable crossing methodology that will be adopted will depend upon a number of factors, including the burial depth of existing pipelines/cables, seabed conditions, cable protection requirements, and the cable separation and crossing requirements of the existing pipeline/cable owner.

23.9.65 If the cable or pipeline that needs to be crossed is buried close to, or on, the seabed, a bridge of concrete mattresses or stones will be laid over the cable or pipeline. The Project's export cable would then be laid over the bridge. Concrete mattresses and/or rock dump would then be laid over the top of the Project's export cable for protection. If the cable or pipeline that needs to be crossed is buried deeper than the target burial depth for the Project's export cable, the owner of the existing pipeline/cable may allow the export cable to be directly buried using techniques such as water flow jetting, or mass-flow trenching.

23.9.66 Fully-termed cable/pipeline crossing agreements will be established prior to installation of the Project's export cable. These will govern the proposed crossings and the relative rights and obligations of both the crossed, and crossing, parties. These agreements will ensure that, under routine circumstances, appropriately constructed crossings will not present an adverse impact, to either the owner of existing pipelines/cables, or the Applicant. However, the potential exists for an adverse impact, associated with a reduced level of access, in the unlikely event that a repair to the existing pipeline/cable is required at, or within the immediate vicinity of, the crossing point.

#### *Likely environmental effects*

23.9.67 Overall, it is predicted that the potential impact will be direct, of a continuous nature, and of long-term duration. The sensitivity of the receptor covered by this subsection is considered to be medium and the magnitude is deemed to be minor. The effect will, therefore, be of slight adverse significance, which is not significant in EIA terms.

#### *Further mitigation and future monitoring*

23.9.68 No further mitigation is required, and a formal monitoring programme is not applicable for the slight adverse effect described in this section.

### **Decommissioning Phase**

23.9.69 The impacts of the decommissioning of the Project on Other Infrastructure and Licensed Activities have been assessed in the offshore study area. The environmental effects arising from the decommissioning of the Project are listed in Table 23.4, along with the Design Envelope criteria against which each decommissioning phase impact has been assessed.

23.9.70 A description of the potential interactions between the receptors associated with Other Infrastructure and Licensed Activities, and each identified impact, is given below.

#### ***Decommissioning vessel traffic, transiting to, within, and from, the Project interferes with the activities of other sea-users***

23.9.71 During the decommissioning phase a range of vessels will transit to, within, and from the Project Site. These vessels will include some, or all, of the following: jack-up barges, heavy lift vessels, tugs, anchor handlers, crew transfer vessels, guard vessels, supply vessels, and emergency response and rescue vessels.

23.9.72 These vessels will transit both, across the subsea infrastructure and other licenced activities, and around the above-sea offshore infrastructure, that's in place at the time of decommissioning. The vessel traffic associated with the decommissioning of the Project has the potential to interfere with the on going activities of other offshore operators that may be active in the study area at the time.

#### *Likely environmental effects*

23.9.73 The potential impacts associated with an increased level of marine traffic will be direct, and may include physical obstruction, queuing, and occupation of berths and anchorages. The potential impacts associated with an increased requirement for marine vessels may be indirect, such as increased competition for, and therefore potentially reduced access to, charter vessels.

23.9.74 Overall, it is predicted that the potential impacts could be both direct and indirect, of an intermittent nature, and of medium duration. The sensitivity of the receptors covered by this subsection is considered to be **medium** and the magnitude is deemed to be **negligible**. Where the same receptors remain in place at the time of decommissioning, the effect is expected to be of **slight** adverse significance, which is not significant in EIA terms.

#### *Further mitigation and future monitoring*

23.9.75 It is not anticipated that further mitigation will be required, and it is expected that a formal monitoring programme will not be applicable for the **slight** adverse effect described in this section.

### **Cumulative Impact Assessment**

23.9.76 The cumulative impacts of the Project on Other Infrastructure and Licensed Activities have been assessed in the offshore study area. Other projects taken into account as part of the cumulative impact assessment are listed in Table 23.7 below. Further details of these projects are provided at ES Chapter 36 'In-combination and Cumulative Impacts'.

*Table 23.7: List of other projects assessed for cumulative impact*

Other projects considered as part of cumulative impact assessment
Oil and gas platforms and pipelines: Douglas (pipeline to Point of Ayr gas terminal), Liverpool Bay floating oil storage and offloading facility (pipeline to Douglas), Hamilton platform (pipeline to Douglas), Hamilton north platform (pipeline to Douglas), Hamilton east subsea well head (pipeline to Hamilton north), Lennox platform (pipelines to/from Douglas), and Conwy/Corfe platform (under construction, including pipeline to Douglas).
Cables (HVDC interconnectors and telecoms): EirGrid east West Interconnector, HVDC Western Link (under construction), ESAT 2, Hibernia 'A' and 'C', Sirius south, Lanis 1, and Emerald Express Cable System.
Offshore wind farms and cables - Burbo Bank, North Hoyle, Rhyl Flats and Gwynt y Môr (under construction).
Aggregate extraction areas - Licence Area 457, Licence Area 392/393, new proposed aggregate extraction area (adjacent to 392/393).
Maintenance dredging - Port of Liverpool (Mersey, Queens east and Crosby Shoal), and Port of Mostyn.
Spoil disposal sites - Disposal Site Z (maintenance dredge), Disposal Site Y (capital dredge), Mostyn Deep (maintenance), Mersey (Mid-river Site), Mersey (Garston Site), and Mersey (Bromborough 2).
Port of Liverpool - proposed anchorage area.

23.9.77 The majority of the other projects considered as part of the cumulative impact assessment, and listed in Table 23.7 above, are also the receptors covered within this chapter. It is therefore not advantageous to single out each of these individual projects, in order to conduct a cumulative impact assessment aimed at determining the combined impact presented by the full list of other projects.

23.9.78 It is, however, of note that all of the existing infrastructure, and each of the existing licensed activities, covered within this chapter, underpin commercial activities that generate value by either, using the seabed, or exploiting natural resources. It is expected that, despite the various potential impacts presented by the present list of other sea-users, each of the receptors covered within this chapter will continue to function as commercially viable interests.

23.9.79 This expectation indicates that the post-mitigation magnitude of the cumulative impact presented to each of the receptors is, in the majority of instances, either **minor, insignificant** or **no change**. If the sensitivity of each receptor is taken to be **moderate** then the effect will be of **slight** adverse or neutral significance, which is not significant in EIA terms. This general finding suggests that, for the time being, the study area offers adequate carrying-capacity to sustain the existing, and currently proposed, level of offshore activity.

23.9.80 That said, the development of each of the licenced activities identified within this chapter is essentially mutually exclusive, in terms of overlapping spatial extents, throughout the respective project lifetimes. As such, the development of additional future licenced activities (that have not been identified within this chapter) alongside, or following, the development of the Project, will incrementally decrease the overall spatial extent available within the study area.

23.9.81 An exception to the above general approach is presented by the potential cumulative impact identified below.

***Proposed anchorage area, and the presence of wind turbines, prevents or impedes the acquisition of further seismic survey data***

23.9.82 A potential cumulative impact upon the ability of oil and gas developers to acquire further 2D, 3D, and 3D Ocean Bottom Cable (OBC) seismic data may occur as a result of the Port of Liverpool's proposed anchorage area, combined with the physical presence of the total number of wind turbines constructed within the study area, i.e. the Project's wind turbines, plus the wind turbines present within the four other offshore wind farms identified in Table 23.7.

23.9.83 The oil and gas industry has previously acquired exploratory 2D and 3D seismic data across the majority of the study area. However, the actual, or potential, presence of ships anchored within the Port of Liverpool's proposed anchorage area, and the physical presence of wind turbines located within the study area, will either prevent, or impede, the acquisition of conventional towed-array 2D and 3D exploratory seismic data, as well as 3D OBC seismic data, at those sites.

23.9.84 Oil and gas operators' looking to undertake conventional exploratory 2D, 3D and 3D OBC seismic survey operations on the UKCS, are required to submit PON14a Applications for Consent to DECC, and receive approval, in advance of conducting surveys. PON14a permit data is available on the DECC website during the period 2001 to 2012. During 2012, two separate PON14a Applications for Consent (one for a conventional 2D survey, and the other for a 3D OBC survey) were submitted to DECC specifying survey areas located along the northern perimeter of the study area (Blocks 110/7, 110/8 and 110/9). However, a search through the DECC dataset confirms that no PON14a Applications for Consent, detailing conventional exploratory 2D, 3D or 3D OBC survey areas within the southern half of the study area, i.e. within the vicinity of proposed Port of Liverpool anchorage area and the offshore wind farms (Blocks 110/11, 110/12,

110/13, 110/14, 110/15, 110/16, 110/17, 110/18, 110/19, and 110/20), were submitted to DECC between 2001 and 2012.

23.9.85 Elsewhere in the Irish Sea, the acquisition of high-resolution digital data (which uses shorter and therefore more manoeuvrable towed seismic arrays) has been proposed as a means for permitting oil and gas exploration activities to continue above prospects that are now located partly, or fully, beneath the boundary of existing operational wind farms.

23.9.86 The relatively mature stage of oil and gas development within the Liverpool Bay area, coupled with the apparent lack of recent interest in acquiring new conventional 2D, 3D and 3D OBC seismic data within the southern half of the study area, has been taken into consideration when assessing the magnitude of this potential cumulative impact.

#### *Likely environmental effects*

23.9.87 Overall, it is predicted that the potential impacts could be direct, of a continuous nature, and of long-term duration. The sensitivity of the receptor covered by this subsection is considered to be **medium** and the magnitude is deemed to be **minor**. The effect will, therefore, be of **slight** adverse significance, which is not significant in EIA terms.

#### *Further mitigation and future monitoring*

23.9.88 It is not anticipated that further mitigation will be required, and it is expected that a formal monitoring programme will not be applicable for the **slight** adverse effect described in this section.

### **Trans-boundary Effects**

23.9.89 The Project will not give rise to any trans-boundary effects relating to Other Infrastructure and Licensed Activities.

### **Inter-Related Effects**

23.9.90 The Project will not give rise to any inter-related effects associated with Other Infrastructure and Licensed Activities.

## 23.10 Conclusion and summary tables

23.10.1 This chapter provides the results of the EIA undertaken to establish the potential impacts of the Project on Other Infrastructure and Licensed Activities that either exist, or are being planned, within the study area. The receptors included oil and gas operations, offshore cables, offshore wind farms, underground coal gasification operations, aggregate extraction activities, maintenance dredging operations, and waste disposal activities.

23.10.2 A number of 'built-in' mitigation measures have been incorporated within the Project definition. These include applying an appropriate and sufficient degree of consultation, employing industry best-practice for cable/pipeline crossings, and employing standard maritime good practice for transiting vessels.

23.10.3 A summary of the impacts and effects that might potentially occur during each phase of the Project, i.e. construction, maintenance and decommissioning, is provided in Table 23.8. Only one of the pre-mitigation effects - namely the potential for export cable-lay operations to interfere with oil and gas operations when the cable is laid across licensed Blocks - was deemed to be significant in EIA terms. The likelihood of this impact occurring was considered to be very low, and the application of some routine mitigation reduced the effect to not significant in EIA terms.

23.10.4 Based on current and reasonably foreseeable levels of activity within the study area, it is concluded that, in general, the cumulative impacts are deemed to be not significant in EIA terms for the receptors assessed.

Table 23.8: Summary of significance, mitigation and monitoring

Summary tables – Other Infrastructure and Licensed Activities						
Description of impact	Magnitude of impact	Sensitivity of receptor	Significance of effect	Potential Mitigation Measures	Residual Effect	Proposed monitoring
Construction Phase						
Construction vessel traffic, transiting to, within, and from, the Project interferes with the activities of other sea-users	<b>Negligible</b>	<b>Medium</b>	<b>Slight</b> adverse (insignificant)	None	<b>Slight</b> adverse (insignificant)	None
Seabed sediment redistributed to, and deposited at, licensed aggregate extraction areas	<b>Negligible</b>	<b>Medium</b>	<b>Slight</b> adverse (insignificant)	None	<b>Slight</b> adverse (insignificant)	None
Airborne construction noise increases noise exposure for offshore personnel operating other infrastructure	<b>No change</b>	<b>Medium</b>	<b>Neutral</b> (insignificant)	None	<b>Neutral</b> (insignificant)	None

Table 23.8: continued

Summary tables – Other Infrastructure and Licensed Activities						
Description of impact	Magnitude of impact	Sensitivity of receptor	Significance of effect	Potential Mitigation Measures	Residual Effect	Proposed monitoring
Construction Phase						
Subsea piling noise interferes with oil and gas seismic surveys	<b>Moderate</b>	<b>Medium</b>	<b>Moderate</b> adverse (significant)	Screening-out of interference during data processing, coupled with close liaison and forward planning with oil and gas operator	<b>Minor</b> magnitude <b>Slight</b> adverse (insignificant)	None
The Project's export cable-lay operations interfere with oil and gas operations when the cable is laid across licensed Blocks	<b>Moderate</b>	<b>Medium</b>	<b>Moderate</b> adverse (significant) but highly unlikely	Close liaison and forward planning with oil and gas operator	<b>Minor</b> magnitude <b>Slight</b> adverse (insignificant)	None

Table 23.8: continued

Summary tables – Other Infrastructure and Licensed Activities						
Description of impact	Magnitude of impact	Sensitivity of receptor	Significance of effect	Potential Mitigation Measures	Residual Effect	Proposed monitoring
Operation Phase						
Operation, maintenance and repair vessel traffic transiting to, and from, the Project, interferes with other sea-users	<b>Minor</b>	<b>Medium</b>	<b>Slight</b> adverse (insignificant)	None	<b>Slight</b> adverse (insignificant)	None
Scour leads to seabed sediment being redistributed to, and deposited at, licensed aggregate extraction areas	<b>No change</b>	<b>Medium</b>	<b>Neutral</b> (insignificant)	None	<b>Neutral</b> (insignificant)	None
Physical presence of wind turbines prevents, or impedes, oil and gas developers acquiring further seismic survey data	<b>Minor</b>	<b>Medium</b>	<b>Slight</b> adverse (insignificant)	None	<b>Slight</b> adverse (insignificant)	None
Physical presence of the wind turbines causes a wake-loss effect on the Gwynt y Môr offshore wind farm	<b>Negligible</b>	<b>Medium</b>	<b>Neutral</b> (insignificant)	None	<b>Neutral</b> (insignificant)	None

Table 23.8: continued

Summary tables – Other Infrastructure and Licensed Activities						
Description of impact	Magnitude of impact	Sensitivity of receptor	Significance of effect	Potential Mitigation Measures	Residual Effect	Proposed monitoring
Operation Phase						
The crossing structures required as a result of the installation of the Project's export cable impacts repair of existing cables and pipelines	<b>Minor</b>	<b>Medium</b>	<b>Slight</b> adverse (insignificant)	None	<b>Slight</b> adverse (insignificant)	None
Decommissioning Phase						
Decommissioning vessel traffic, transiting to, within, and from, the Project interferes with the activities of other sea-users	<b>Negligible</b>	<b>Medium</b>	<b>Slight</b> adverse (insignificant)	None	<b>Slight</b> adverse (insignificant)	None
Cumulative Impact						
Proposed anchorage area, and the presence of wind turbines, prevents or impedes the acquisition of further seismic survey data	<b>Minor</b>	<b>Medium</b>	<b>Slight</b> adverse (insignificant)	None	<b>Slight</b> adverse (insignificant)	None

## Glossary

ALARP	As Low as Reasonably Practicable
CBM	Coal Bed Methane
Cefas	Centre for Environment Fisheries & Aquaculture Science
DECC	Department of Energy and Climate Change
EIA	Environmental Impact Assessment
ES	Environmental Statement
HVDC	High Voltage Direct Current
ICPC	International Cable Protection Committee
MMO	Marine Management Organisation
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NUI	Normally Unattended Installation
OBC	Ocean Bottom Cable
PEI	Preliminary Environmental Information Technical Report Version 2 (April 2012)
SCUK	Subsea Cables UK
SEA	Strategic Environmental Assessment
TCA	The Coal Authority
UCG	Underground Coal Gasification
UKCS	United Kingdom Continental Shelf
UXO	Unexploded Ordnance
WG MCU	Welsh Government Marine Consents Unit

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