Contents

List of Tables

List of Figures

Abbreviations and Acronyms

ALARP	As Low As Reasonably Practicable
EIA	Environmental Impact Assessment
HE	High Explosive
ICOL	Inch Cape Offshore Limited
MOD	Ministry of Defence
OSPs	Offshore Substation Platforms
OWFs	Offshore Wind Farms
PEXA	Practice and Exercise Areas
RYA	Royal Yachting Association
STW	Scottish Territorial Waters
UXO	Unexploded Ordnance
WWI	World War One
WWII	World War Two

21 Other Human Activities

21.1 Introduction

1 This chapter reports the assessment of the predicted impacts of the Inch Cape Offshore Wind Farm and the Offshore Transmission Works (OfTW) on other marine uses and users and activities not covered in other chapters of this Environmental Statement (ES). It addresses military activities, subsea cables, unexploded ordnance (UXO) and marine recreational uses (see *Section 21.2*).

2 This chapter is supported by *Appendix 21A: Unexploded Ordnance Assessment*. This desk based study includes geotechnical and construction operations involved with the installation of Wind Turbine Generators (WTGs) and inter-array cables, and the installation of the Export Cable in order to holistically determine the potential UXO threat.

3 This chapter also shares linkages with the following chapters and makes reference to their content where relevant:

- *Chapter 10: Metocean and Coastal Processes*;
- *Chapter 17: Cultural Heritage and Marine Archaeology*;
- *Chapter 19: Shipping and Navigation*; and
- *Chapter 23: Summary of Effects*.

21.2 Consultation

4 Consultation with the representative bodies of other marine users and activities has been carried out as part of the Environmental Impact Assessment (EIA) scoping exercise for the Inch Cape Offshore Wind Farm (see *Chapter 5: Stakeholder Engagement, Section 5.4*). A desktop feasibility assessment was undertaken to define the Offshore Export Cable Corridor (see *Appendix 6A: Export Cable Feasibility Study*) and as part of this, other marine users and activities were identified that could be impacted by the OfTW (works within the Offshore Export Cable Corridor).

5 In addition to the formal Scoping Opinion, further informal consultation has been undertaken in relation to the assessment of the impacts of the Wind Farm and OfTW with relevant stakeholders, including the Royal Yachting Association Scotland (RYA) (*Chapter 19, Table 19.1)*. The information received through this consultation, together with the formal Scoping Opinion has informed the methodology and scope for the assessment of the impacts on other marine uses, users and activities presented in this chapter.

21.2.1 Development Area

6 The following activities were scoped out of the assessment as part of the formal EIA scoping process (*Chapter 5*) because they were not found within the Development Area or predicted to have any interaction with it:

- Military Practice and Exercise Areas (PEXA);
- Oil and gas infrastructure;
- Marine disposal sites;
- Telecommunications; and
- Aggregate extraction.

7 The RYA was the only respondent to raise any concerns relevant to the assessment presented in this chapter. In relation to the Development Area, RYA's concerns with offshore wind energy developments and recreational boating relate to: navigational safety (collision risk, risk management and emergency responses, marking and lighting, effect on small craft navigational and communication equipment, weather), location (loss of cruising routes, squeeze into commercial routes, effect on sailing and racing areas, cumulative effects, visual intrusion and noise), end of life (dereliction, decommissioning), and consultation. The majority of these issues have been considered as part of the assessment of the proposals in *Chapter 19*. This chapter considers only the impacts of the proposals predicted on sailing and yachting activity in terms of disruption to activities and the recreational enjoyment of the activities. These effects are reported in *Section 21.6* and *Section 21.7.*

8 Consultation carried out with the Ministry of Defence (MOD) raised no specific concerns regarding UXO. However, results of a desk based study suggest there is potential risk associated with UXO. Consequently this has been scoped in to the assessment and is addressed in this chapter, with supporting details in *Appendix 21A*.

9 In summary, on the basis of consultation and desk study the following activities are scoped into the Development Area impact assessment:

- Marine recreational activities; and
- UXO.

21.2.2 Offshore Export Cable Corridor

10 The Offshore Export Cable Corridor desktop search and feasibility study (*Appendix 6A*) confirms that, as a result of there being little or no interaction with the Offshore Export Cable Corridor the following activities are not considered in this assessment:

- Marine disposal sites;
- Telecommunications; and
- Aggregate extraction.

11 On the basis of the findings of the study presented in *Appendix 6A* the following activities are considered in this assessment:

- Marine recreational activities;
- Military PEXAs;
- Subsea cables and pipelines; and
- UXO.

21.3 Design Envelope and Embedded Mitigation

12 The potential development parameters and scenarios for the Project are defined as a Design Envelope and presented in *Chapter 7: Description of Development*. The assessment of impacts on other human considerations is based upon the worst case scenario as identified from this Design Envelope.

13 For this assessment these include consideration of the design, construction and operation of WTGs, meteorological masts, foundations and substructures, Offshore Substation Platforms (OSPs), inter-array cables and Export Cables. In each case the largest parameters within the Design Envelope has been considered.

14 A range of Embedded Mitigation measures to minimise environmental effects are captured within the Design Envelope (see *Chapter 4: Process and Methodology, Sections 4.4.1* and *4.5.2*). The assessment of effects on other human considerations has taken account of the Embedded Mitigation measures outlined below.

15 Marine Recreational Activities:

- Provision of safety/exclusion zones around construction activities (500 m);
- The Wind Farm and OfTW structures will be marked on relevant United Kingdom Hydrographic Office (UKHO) admiralty charts. The Offshore Export Cable will also be charted, although whether the inter-array cables are shown will depend on the scale of the chart.
- Promulgation of information and appropriate liaison will be carried out to ensure information on the works are circulated through agreed procedure e.g. Notices to Mariners, Kingfisher and other appropriate media to allow vessels to effectively and safely navigate around the proposed sites.

16 Military Practice and Exercise Areas:

- To mitigate any impact on the military exercise area during the construction phase of the Project, on-going consultation with the MOD will be maintained to determine the frequency and nature of their activities so that unnecessary disruption is avoided. The presence of the PEXA will also be included in any construction risk assessments, due to the nature of the practice activities in this area.

- Promulgation of information and appropriate liaison with the MOD will be carried out to ensure information on the works are circulated through agreed procedure e.g. Notices to Mariners, Kingfisher and other appropriate media.

17 Subsea Cables and Pipelines:

- Prior to construction a crossing agreement with National Grid Gas plc. will be concluded to ensure that the Offshore Export Cables are designed to safely cross the line of an existing gas pipeline in the Firth of Forth. The agreement would include definition of appropriate construction and maintenance methods to prevent any adverse impacts on the integrity or operation of the gas pipeline.
- Consultation with National Grid Gas plc. will be maintained throughout the construction process to ensure that the appropriate construction methodologies and operations agreed in the crossing agreement are applied when crossing the gas pipeline with the Offshore Export Cable. The measures agreed in the crossing agreement will also be included within the health and safety risk assessment prior to construction.

18 Unexploded Ordnance:

- A UXO threat assessment will be undertaken prior to construction and risk mitigation measures will be implemented with regard to all hazards on site. All practicable mitigation measures to minimise the risk of health and safety incidents associated with UXO will be fully developed prior to construction, as per standard industry practice and included in the Project health and safety plan. Specific measures include the following:
  - Survey will be undertaken prior to any intrusive works to confirm the presence and form of any known or potential UXO.
  - Survey anomalies which indicate the presence of UXO will be avoided through micro-siting of all infrastructure works which could disturb UXO. Establishment of a formal quality assurance process with sign-off certification of the design process from a UXO specialist to reduce risks to As Low As Reasonably Practicable (ALARP).
  - The scope and extent of further surveys to detect the presence of UXO in advance of major maintenance work will be considered in advance of scheduling and undertaking maintenance which has the potential to affect UXO.
  - A UXO coordinator will be part of the vessel crew on relevant construction and maintenance vessels involved in activities where there is a risk of encountering previously unidentified UXO to ensure that all safety procedures and responses are adhered to during operations and in the event of UXO being encountered.
  - Crew on board all vessels involved in Project construction, maintenance and support during operations will be regularly briefed on munitions safety procedures and awareness.

19 A UXO management procedure will be put in place to manage any unanticipated finds of suspected UXO. These measures will be delivered as part of the Project Environmental Management Plan (see *Appendix 7A: Draft Environmental Management Plan*).

21.4 Baseline Environment

21.4.1 Data Collection and Survey

20 Information on the distribution and nature of marine activity and other users of the marine environment has been gathered through consultation and a high level desk study of available data, including:

- Admiralty charts;
- SeaZone data (SeaZone, 2013);
- PEXA charts; and
- RYA UK Coastal Atlas of Recreational Boating (RYA 2005).

21 The future baselines for the topics covered in this chapter are not considered to be significantly different from those reported in the following sections for the respective existing baseline conditions.

22 The remainder of this section outlines the baseline conditions for each of the topics addressed in this chapter and considers them for the Development Area and the Offshore Export Cable Corridor together.

21.4.2 Marine Recreational Activities

23 The Firth of Forth and Firth of Tay support a range of recreational activities which operate throughout the year across a range of areas. These are briefly detailed in this section.

Sailing

24 Recreational sailing is assessed in this chapter, in relation to disruption to activities and effects on the experience enjoyed by sailors undertaking recreational sailing (and not in relation to effects on navigational safety). Recreational sailing activity in and around the Development Area and Offshore Export Cable Corridor is considered in *Chapter 19 and Section 21.2.1*, and potential impacts upon it are assessed as part of the Navigational Risk Assessment (see *Appendix 19A* and *Appendix 19B* respectively, for the Development Area and Offshore Export Cable Corridor).

25 There is an active presence of RYA registered sailing clubs/marinas in the Firth of Forth and Firth of Tay estuaries (see Figure 21.1), which cater to all types of sailing from small dinghies to large yachts, from cruising to club and national racing championships (East Lothian and Visit Scotland, 2010, RYA 2011). None of the registered marinas would be directly impacted by the Project. The nearest RYA registered marinas are situated at Musselburgh and Portobello, approximately five kilometres and eight kilometres, from the nearest Export Cable landfall option respectively.

26 There is also a level of non-club associated sailing which takes place in the Forth and Tay estuaries. This is particularly difficult to measure and predict, due to lack of available information, however, general observation from the coastline indicates that informal

recreational sailing is regularly practised in waters close to the coast of the Firths of Forth and Tay, particularly during summer months.

27 In order to understand the spatial patterns of sailing activity, data gathered from the registered RYA clubs, which is compiled within RYA's UK Coastal Atlas of Recreational Boating (RYA, 2005 and updates), was plotted to illustrate typical RYA cruising routes (shown in Figure 21.1). These routes have been identified within *Chapter 19* and are considered to receive light use (see *Section 19.5.1* and *Section 19.5.2*). None of the registered cruising routes directly interacts with the Development Area. Several routes laterally cross the Offshore Export Cable Corridor, although the direct area affected is limited in extent.

28 It is however, possible for these routes to change and, for individual mariners and non-club affiliated sailors to deviate from the routes, potentially straying into parts of the Offshore Export Cable Corridor.

Scuba Diving

29 Scenic diving areas are largely confined to areas of rocky coastline (e.g. Bass Rock and St Abbs) with activity also focused on the Isle of May in the Firth of Forth. Scenic diving in the inner Forth and Tay is limited as a result of water turbidity (WWF, 2006) and is also limited further offshore as a result of a lack of seabed features.

30 Wreck diving also takes place off the coastline of the Forth and Tay. There are four charted wrecks noted within the Development Area (see *Section 17.6.2*, but these are in relatively deep water and beyond the reach of many recreational divers. There are a number of wrecks situated in proximity to the Offshore Export Cable Corridor. However, the Offshore Export Cable Corridor has sought toavoid direct interaction with these charted wrecks. This is discussed further in *Section 17.6.3*.

Other Water Sports

31 Scotland's east coast receives swells from the north and north-east and there are consistent offshore winds, and as a result surfing, kite surfing, windsurfing and sea/surf kayaking and canoeing are well established activities (SAS, 2009). There are a number of popular surfing locations in East Lothian, including Belhaven, White Sands and Pease Bay (see *Section 10.2.5* and *Appendix 6B*). There are no popular surfing areas near to the landfall options or the Offshore Export Cable Corridor (East Lothian Council and Visit Scotland, 2010). Longniddry is a popular kite surfing location and is located in close proximity to the landfall option for the Export Cable at Cockenzie. The area is promoted for intermediate to expert kite surfers due to the prevalence of rock outcrops along the beach. There are no other popular kite surfing areas in the vicinity (East Lothian Council and Visit Scotland, 2010).

32 The Offshore Export Cable Corridor and its landfall options provide the only area of potential interaction with any kayaking or canoeing activity. Sea kayaking, which is the most likely type of kayaking/canoeing affected, typically takes place along the coastline (East Lothian Council and Visit Scotland, 2010).

Recreational Fishing

33 In addition to commercial fishing, discussed in *Chapter 18: Commercial Fisheries*, the Firth of Forth and Firth of Tay waters support coastal and inshore recreational angling. Due to the nature of the activity it is difficult to predict where inshore boat fishing is likely to occur. However small fishing boats are likely to be found predominantly in the inner and outer Forth areas (WWF, 2006).

21.4.3 Military Practice and Exercise Areas

34 Military Practice and Exercise Areas (PEXAs) are areas available for training by the MOD and in some cases involve the firing of live ammunition.

35 There are three main PEXAs that lie within proximity of the Development Area and Offshore Export Cable Corridor:

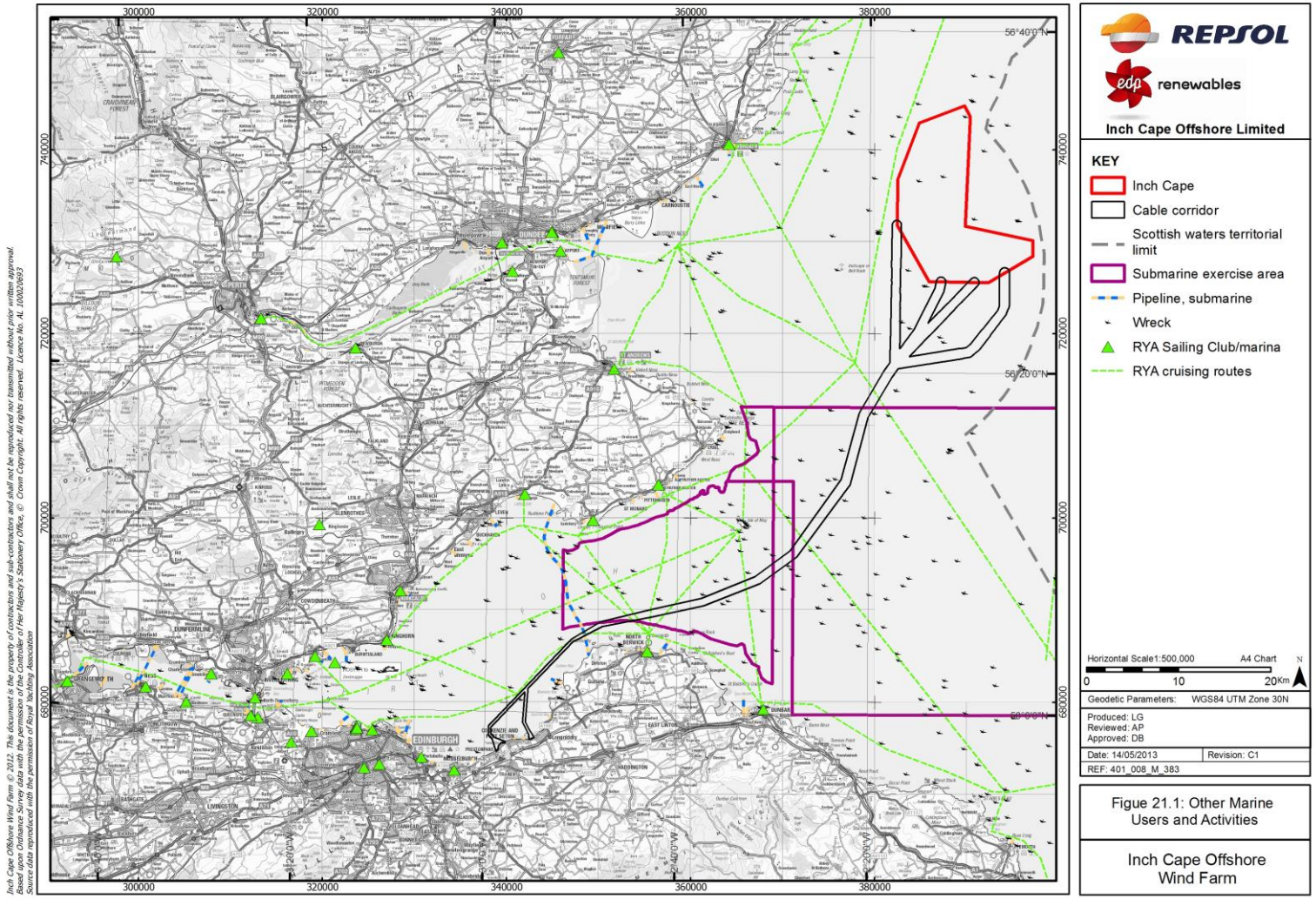
- A submarine exercise area which intersects the Offshore Export Cable Corridor (see Figure 19.3 and Figure 21.1);
- A military firing practice area lies approximately 35 km to the east of the Development Area; and
- Two disused ammunition dumping grounds which lie to the east of the Isle of May, approximately 30 km south west of the Development Area and approximately five kilometres from the nearest point of the Offshore Export Cable Corridor (see Figure 19.3).

21.4.4 Subsea Cables and Pipelines

36 In 2008, The Crown Estate published a report on the potential feasibility of a subsea east coast High Voltage Direct Current Interconnector between Peterhead and Tyneside. A Scoping Opinion was issued (25 April 2012) and this proposed that link options development would be completed by the end of 2014, with the project being completed in 2018. The preferred 500 m wide cable route corridor detailed in the scoping document would not intersect with the Project and the interconnector has not been considered further in this assessment.

37 The only pipeline which has been identified that will have some interaction with the Project is a National Grid Gas plc. gas pipeline in the Firth of Forth which intersects with the Offshore Export Cable Corridor as seen in Figure 21.1.

Figure 21.1: Other Marine Users and Activities



21.4.5 Unexploded Ordnance

38 As a result of military activity along the United Kingdom's (UK) coast and adjacent seas, particularly during World War I (WWI) and World War II (WWII), there is a potential for UXO to be encountered on the seabed. Such UXO might include sunken sea mines, air delivered bombs, naval ammunition, munitions dispersed from sunken ship wrecks, sea dumped munitions and land based munitions that have been fired out to sea.

39 Inch Cape Offshore Limited (ICOL) commissioned a desk-based study (*Appendix 21A*) to identify the risk posed by UXO, and to identify potential measures by which any risks may be reduced to an acceptable level (i.e. to ALARP). The study identified potential UXO sources based on analysis of a variety of historical data and presents the results in the form of a UXO threat and risk assessment which considered the hazards associated with all potential UXO sources.

40 UXO threat within the Development Area and Offshore Export Cable Corridor is primarily the result of munitions and weaponry employed during WWI and WWII: sea mines, munitions related shipwrecks, torpedoes, and dumped munitions represent the main sources of UXO within the Development Area and Offshore Export Cable Corridor. Table 21.1 below summarises information on potential UXO sources identified within the Development Area and Offshore Export Cable Corridor.

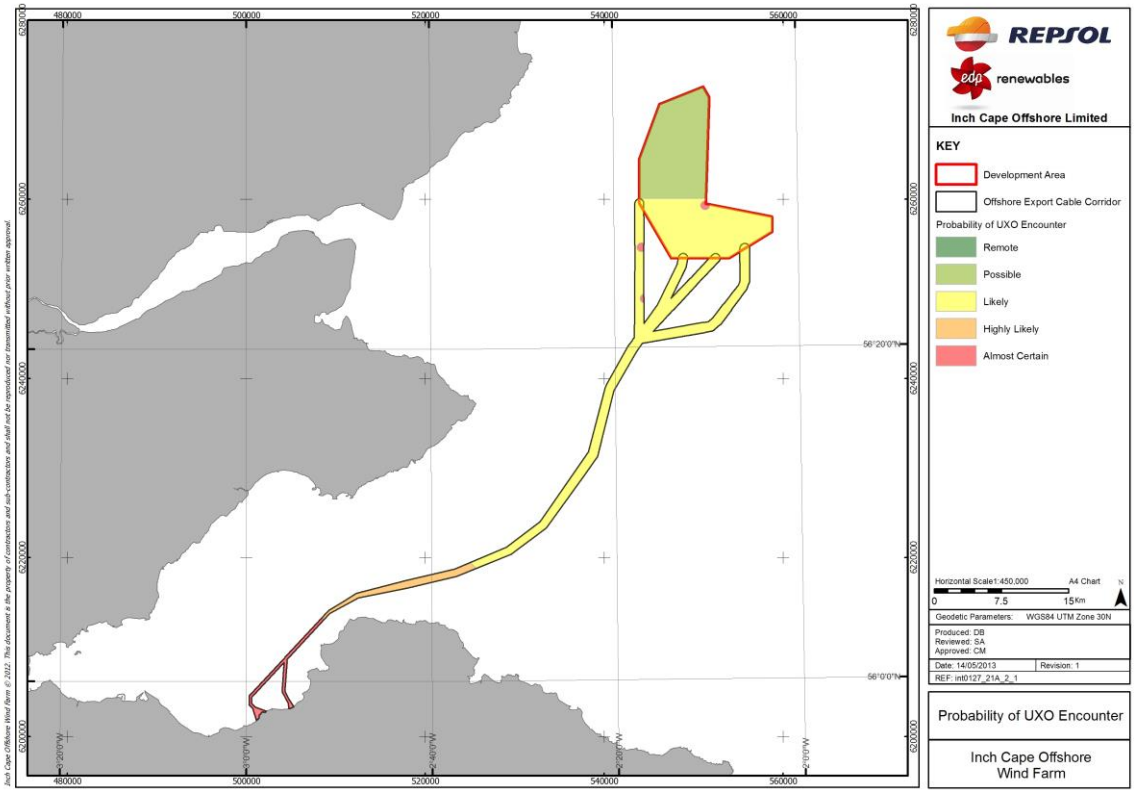
Table 21.1: Potential UXO Sources within the Development Area and Offshore Export Cable Corridor

Potential sources of UXO Contamination	Threat Items	Threat To Development Area	Threat To Offshore Export Cable Corridor
Naval Warfare (WWI and WWII)	Torpedoes and artillery projectiles	Possible; German U-Boats were active within the North Sea in both World Wars. Allied vessels (both merchant and warships) were armed in order to combat the U-Boats.	Possible to likely; German U-Boats were active within the North Sea in both World Wars. Allied vessels (both merchant and warships) were armed in order to combat the U-Boats.
Sea Minefields (Axis)	German sea mines	Possible to likely; the Axis forces used U-Boat deployed mines in WWI and aerial delivered mines in WWII in the vicinity of the Development Area.	Possible to likely; the Axis forces used U-Boat deployed mines in WWI and aerial delivered mines in WWII in the vicinity of the Offshore Export Cable Corridor.
Sea Minefields (Allied)	British sea mines (Mk. XVII)	Possible; Allied minefields that formed parts of the east coast mine barrier were located within 20 km of the Development Area.	Possible to likely; An Allied declared mine area is located off North Berwick to the south of the Offshore Export Cable Corridor.

Potential sources of UXO Contamination	Threat Items	Threat To Development Area	Threat To Offshore Export Cable Corridor
Aerial Bombing	German 50 kg-1,000 kg High Explosive (HE) bombs	Possible to likely; convoys that passed through the Development Area were bombed by the Luftwaffe.	Possible to likely; convoys that passed through the site were bombed by the Luftwaffe and the Offshore Export Cable Corridor is within proximity to land based targets.
Munitions Related Shipwrecks	Unspecified general munitions	Almost Certain; naval warfare sank one wreck which could contain munitions within the Development Area.	Almost certain; naval and Submarine warfare sunk five wrecks within the Offshore Export Cable Corridor.
Armament and Training Areas (WWII)	Artillery projectiles and torpedoes	Highly likely; WWII Torpedo running from aircraft facility and firing practice located over the Development Area. Royal Naval training areas are located to the west and south of the Development Area and anti-aircraft batteries are located along the east coast of Scotland.	Highly likely; WWII Torpedo running from aircraft facility and firing practice located over the Offshore Export Cable Corridor. Royal Naval training areas are located to the west and south of the Offshore Export Cable Corridor and anti-aircraft batteries are located along the east coast of Scotland.
Armament and Training Areas (Modern)	Training mines and other unspecified munitions	Likely to highly likely; there are Royal Naval training areas located in the vicinity of the Development Area.	Highly likely; there are Royal Naval training areas located in the vicinity of the Offshore Export Cable Corridor. Live Mine Counter Measures and General Practices are located on the Offshore Export Cable Corridor.
Munitions Disposal Areas	Unspecified general munitions	Remote: there are munitions disposal areas located 30 km from the Development Area. However post WWII munitions dumping was often poorly monitored and thus illegal dumping in the vicinity of specified munitions dumps often occurred.	Likely: there are munitions disposal areas located 2.5 km from the Offshore Export Cable Corridor. Post WWII, munitions dumping was often poorly monitored and thus illegal dumping in the vicinity of specified munitions dumps often occurred.

41 The probability of UXO encounter within the Development Area and Offshore Export Cable Corridor has been mapped on the basis of desk study findings and Figure 21.2 presents an overview of the possibility of UXO encounter in the different spatial offshore areas of the Project. The majority of the Development Area and the Offshore Export Cable Corridor is considered to have a background residual UXO threat resulting from general wartime and subsequent military training activities in the region. The probability of encountering UXO is slightly higher along the Offshore Export Cable Corridor due to the historic and current military training areas that overlie the Offshore Export Cable Corridor, which include torpedo and live firing training.

Figure 21.2: Possibility of UXO Encounter



21.5 Assessment Methodology

21.5.1 Approach to Assessment

42 The assessment methodology applied within this chapter follows that described in *Chapter 4: Process and Methodology*. Magnitude is assigned using the criteria presented in Table 4.5. Sensitivity criteria specific to human users and activities have been applied and these are shown in Table 21.2.

Table 21.2: Criteria for Assessing the Sensitivity of Other Marine Users and Activities as Receptors

Sensitivity	Receptor Characteristics and Examples
High	Nationally and/or Strategically important areas or locations including: • Marine Recreational Areas and their users such as high quality and very regularly used recreational sailing and racing routes, diving sites and recreational beaches. • Military Practice and Exercise Areas of strategic defence or military operational importance. • Subsea Cables and Pipelines of strategic infrastructure importance and/or where protection is paramount. • Unexploded Ordnance whose presence is classed as likely to almost certain to be present.
Moderate	Regionally important areas or locations including: • Marine Recreational Areas and their users such as moderate quality or regularly used recreational sailing routes, diving sites and recreational beaches. • Military Practice and Exercise Areas of defence or military operational importance. • Subsea Cables and Pipelines of strategic infrastructure importance. • Unexploded Ordnance whose presence is classed as remote to possible.
Low	Locally important areas or locations including: • Marine Recreational Areas and their users such as occasionally used recreational sailing routes, diving sites and recreational beaches. • Military Practice and Exercise Areas of limited defence or military operational importance. • Subsea Cables and Pipelines of some infrastructure importance. • Unexploded Ordnance unlikely to be present.
Negligible	Areas of limited importance including: • Marine Recreational Areas with very limited appeal and use for recreation. • Military Practice and Exercise Areas of no particular importance. • Subsea Cables and Pipelines with limited infrastructure importance. • No unexploded ordnance present.

21.6 Impact Assessment: Development Area

43 The findings of the assessments presented below have taken into account the Embedded Mitigation described in *Section 21.3* and the Additional Mitigation described in *Section 21.9.*

21.6.1 Effects of Construction

Marine Recreational Activity

44 Construction within the Development Area may potentially impact on recreational sailing interests. The impacts will derive mainly from the increase in construction and support vessel movements within the Development Area and in adjacent waters, and from the presence of foundations, which may be *in situ* for a period of time prior to erection of WTGs. Both these scenarios may result in increased navigation risk. These potential impacts have been discussed in *Section 19.6*.

45 As no RYA cruising routes directly interact with the Development Area (see *Section 21.4.2*), and informal recreational sailing is very limited in these waters, it is very unlikely that the construction within the Development Area will cause any direct disruption to these routes. In addition, the regular publishing of Notices to Mariners (see *Section 21.9*) will ensure that marine users of the area are aware of activities planned, and ongoing, which have the potential to affect navigation and recreational activity.

46 It is possible that construction vessels in the wider area may intersect the routes followed by recreational sailing vessels during the construction phase. However, given that there are no formal cruising routes in the Development Area and other recreational sailing routes receive low to medium use (see *Section 21.6.1*) it is unlikely that the construction operations will cause any sustained interruption to sailing activities. Therefore, the potential impacts are assessed as moderate.

47 The construction within the Development Area is not predicted to have a significant effect on recreational diving. Whilst two wreck sites are located within the Development Area, these are considered to be in water too deep to be regularly accessed by recreational divers. Indirect effects of construction such as the increased turbidity of water associated with construction of marine structures is not predicted to have a significant adverse effect on diving activities at other sites such as wrecks and rock features in shallower waters of the Firths. Residual impacts on recreational diving are predicted to be minor.

48 The impacts from construction activities within the Development Area are considered to be negligible in magnitude for all surfing and leisure beaches as quantified changes identified in *Chapter 10* are not predicted to experience any meaningful change (i.e. anything that would be measurable) in metocean processes or the sedimentary environment. The sensitivity of these beaches to changes in the metocean and sediment regimes is assessed as moderate. The impact of construction activity on surfing and leisure beaches is therefore assessed as minor.

Unexploded Ordnance

49 There is a potential health and safety risk for UXO associated with historic and current military activity to be encountered on the seabed in the Development Area and the Offshore Export Cable Corridor. During construction, activities which will have contact with the seabed, either directly (e.g. jack–up vessel, cable laying) or via the placement of material (e.g. foundations, scour protection or cable protection), are at risk of disturbing UXO with potentially damaging and dangerous effects to operatives, equipment and Wind Farm and OfTW infrastructure.

50 As human life is at risk, receptor sensitivity is considered to be high. Impact magnitude would be high and the effect is of potentially major significance. The likelihood of finding UXO in the Development Area is considered to be possible to likely (see Table 21.1). The Embedded Mitigation and Additional Mitigation measures set out in *Sections 21.3 and Section 21.9* will ensure that all risk is reduced as far as is reasonably practicable and the residual impact is predicted to be minor.

21.6.2 Effects of Operation and Maintenance

Marine Recreational Activities

51 There is little spatial overlap between offshore marine recreational activities and the Wind Farm and the OfTW (within the Development Area) that would affect the long term use of RYA cruising routes during the operational phase. Depending upon ports used for Project maintenance vessels, some interaction between RYA cruising routes and maintenance vessels could occur. However, it is considered to be unlikely and the occurrences would be confined to limited routes for short periods of time. Once the Wind Farm is constructed the area could attract recreational users although initial interest in the Wind Farm would be likely to decline with time. The predicted residual impact of the Wind Farm and OfTW (within the Development Area) on marine recreation for operation and maintenance is predicted to be minor/moderate.

52 The Wind Farm and OfTW is not predicted to have significant effects on recreational diving interests in the Development Area.

53 The siting of WTGs, and other offshore Project structures, could lead to sustained effects on the hydrodynamic regime and wave climate. In principle, these effects could affect the wave quality and impact on wave based recreational activity at surfing and recreational beaches along the coast. However, the conclusions of *Chapter 10* are that the effects on the hydrodynamic regime and wave climate due to the Wind Farm and OfTW will be very small and localised and effects of the Project were found to be very small compared, for example, to the natural variability in the metocean and sediment regimes on metocean processes (see *Section 10.5.2* and *Section 10.6.2*).

54 The magnitude of impacts from the Project operation and maintenance activities are considered to be negligible for all surfing and leisure beaches. The sensitivity of these beaches to changes in the metocean and sediment regimes is assessed as moderate. The

impacts, from operation and maintenance activities within the Development Area, on surfing and leisure beaches is therefore assessed as minor. Residual effects on other coastal recreational users including kayaking, canoeing and sea angling from operation and maintenance of the Wind Farm and OfTW (within the Development Area) are also predicted to be minor.

Unexploded Ordnance

55 The natural processes of the sea, including tidal action, seabed conditions, movement of sand waves, wave action and bad weather all contribute to the movement of objects on the seabed. Human activities such as seabed trawling may also contribute to the movement of objects, and as such there is a risk of UXO moving into the Development Area and Offshore Export Cable Corridor over time. This will have implications for maintenance and repair activities of foundations, cables and scour protection but the risk is predicted to be limited as ICOL will undertake further surveys in advance of such works (see *Section 21.9.5*).

56 As human life is at risk, receptor sensitivity is considered to be high. Effect magnitude is considered to be high, albeit with a low probability of an event occurring. With the implementation of committed mitigation (Embedded and Additional) the residual effect of maintenance and operations on UXO is predicted to be minor.

21.6.3 Effects of Decommissioning

57 The potential effects of decommissioning are considered to be equivalent to, and potentially lower than, the worst case effects assessed for the construction phase (see *Section 21.6.1*). The approach to decommissioning is described in *Section 7.12*. A decommissioning plan will be prepared in accordance with the requirements of the *Energy Act 2004* (see *Section 3.2.5*) and will be subject to approval from the Department of Energy and Climate Change (DECC) prior to implementation.

21.7 Impact Assessment: Offshore Export Cable Corridor

21.7.1 Effects of Construction

Marine Recreational Activities

58 Several RYA cruising routes intersect the Offshore Export Cable Corridor. However, it is unlikely that construction of the Offshore Export Cable will cause any sustained disruption to this activity. Disruption will generally be limited in extent and confined to discrete areas of the Offshore Export Cable Corridor as the Export Cable is installed. Given the level of use these routes receive (low to medium) as disclosed in the surveys within *Chapter 19* (see *Section 19.5*) the ability for this receptor to adapt to a change of route is considered to be high. Nevertheless, in terms of recreational experience for both formal sailing routes and competitions and for informal sailing activity, the movement of construction vessels servicing the Offshore Export Cable Corridor and making journeys through it to reach the Development Area are predicted to have a short term, but high, impact on the recreational experience of sailors. Taking account of the moderate receptor sensitivity a moderate/major

construction phase impact is therefore predicted on recreational sailing activities, particularly for informal sailing in inshore waters during the busiest phases of construction related vessel movements.

59 Other coastal marine recreational activities including scuba diving and surfing are prevalent along the coasts adjacent to the Offshore Export Cable Corridor. However the installation of the Offshore Export Cable is not predicted to greatly interfere with these activities as they do not extend much beyond the coastal zone, with the exception of the landfall approaches.

60 The impact of the construction phase on divers will primarily be due to the release of disturbed seabed sediment into the water column through the various installations, in particular cable burial (and exclusion from any works areas). *Section 10.6* discusses the effects of the construction processes in detail, within the context of environmental impacts. The assessment concludes that disturbance (higher volumes of suspended sediment) due to cable burial is unlikely to occur for extended periods of time and therefore effects on divers visiting wreck sites in the vicinity of the Offshore Export Cable Corridor would be low to negligible.

61 It is possible that the Offshore Export Cable could interact with water sports activities at the landfall options. However, for either landfall option any effects will be temporary through the construction phase and will be highly localised leading to limited disruption. Measures set out in *Section 21.9* will be implemented to ensure that users of the area are made aware of construction activities.

62 Therefore overall, the impact of construction of the Offshore Export Cable on diving, surfing and other coastal/beach and inshore recreational activity is assessed as low to negligible in terms of magnitude and moderate in terms of sensitivity with a minor residual impact overall. There may be very short periods of time during cabling works at the landfall coastline where impacts are higher, as construction activity may require partial closure of beach areas to recreation and access whilst cables are installed.

Military Practice and Exercise Areas

63 The installation activities associated with the construction of the Offshore Export Cable are likely to cause the greatest potential for disruption to the PEXA in the Firth of Forth which is used for naval exercises. The interaction with the Offshore Export Cable however, is confined to the north western portion of the PEXA (see extent in Figure 21.1) and is not predicted to cause a high level of disruption to existing military operations, due to the temporary nature of cable installation works and the small spatial extent of any disruption (focussed on a 500 m area around any cable installation vessel). Although disruption would be low and short term resulting in an effect of low magnitude, the PEXA is regarded as strategically important to military operations and therefore of high sensitivity. Overall, the predicted impact on the PEXA which intersects the Offshore Export Cable Corridor is considered to be moderate.

Subsea Cables and Pipelines

64 A National Grid Gas plc. pipeline intersects the Offshore Export Cable Corridor in the Firth of Forth. There is potential for the construction of the Offshore Export Cable to interaction with the pipeline. As this is a nationally important receptor the sensitivity of this asset is assessed as high.

65 The intersection of the Offshore Export Cable and the pipeline will occur laterally, leading to a very small area of the gas pipeline potentially being affected. The crossing point lies to the north west of North Berwick and would not be affected by the choice of landfall for the Export Cable.

66 When assets such as those described intersect laterally, a crossing agreement is necessary (see *Section 21.3*). On-going consultation with National Grid Gas plc. through the preconstruction planning and development phases will determine the specific design and installation requirements associated with the cable crossing. It will aid identification of any need for remedial crossing protection (e.g. replacement/additional concrete mattresses) that will form part of this agreement.

67 The agreement between ICOL and National Grid Gas plc. will also include health and safety arrangements, construction methodologies, responsibilities and other measures relevant to the type and extent of the crossing. This will ensure the protection of this asset during, and after the construction, of the Offshore Export Cable and a low magnitude of effect is predicted.

68 Overall the impact on this receptor is assessed as low in terms of magnitude and high in terms of sensitivity, resulting in a moderate residual effect**.**

Unexploded Ordnance

69 Consideration of predicted impact on UXO from works within the Offshore Export Cable Corridor is consistent with the assessment of construction activities in the Development Area as reported in *Section 21.6.1* above.

21.7.2 Effects of Operation and Maintenance

Marine Recreational Activities

70 The impacts of any maintenance activities on marine recreational activities are considered in *Section 21.6.2*, for the Development Area. Maintenance activities for the Offshore Export Cable Corridor are considered to be similarly occasional and limited in extent, and the residual impact on marine recreational activities from operation and maintenance in the Offshore Export Cable Corridor are predicted to be minor/moderate for recreational sailing, and minor for all other types of coastal recreational activity.

Military Practice and Exercise Areas

71 As the PEXA (MOD Danger Area) crosses the Offshore Export Cable Corridor only, there is little scope for the operational elements of the Project to affect military operations since the Export Cable will be installed on the seabed and maintenance will be infrequent. Therefore, the impact upon PEXAs during the operational phase is assessed as negligible in terms of magnitude and high in sensitivity, resulting in a minor/moderate impact).

Subsea Cables and Pipelines

72 The likelihood of effects throughout the operation and maintenance of the Offshore Export Cable will be limited due to the scale and nature of any required occasional maintenance works. As described in *Section 21.7.1* any necessary protection measures would be installed following conclusion of the crossing agreement (see *Section 21.*9), protecting this asset from any impacts through the operation and maintenance phase of the Offshore Export Cable.

73 The impact would be negligible in terms of magnitude, sensitivity is high and the residual effect would be minor/moderate.

Unexploded Ordnance

74 The assessment of predicted impact on UXO from the operation and maintenance activities in the Development Area has been reported in *Section 21.6.2* above and applies equally to the Offshore Export Cable Corridor. Residual effects on UXO from Offshore Export Cable maintenance are predicted to be minor.

21.7.3 Effects of Decommissioning

75 The potential effects of decommissioning are considered to be equivalent to, and potentially lower than, the worst case effects assessed for the construction phase in *Section 21.6.1*. The approach to decommissioning is described in *Section 7.12*. A decommissioning plan will be prepared in accordance with the requirements of the *Energy Act 2004* (see *Section 3.2.5*) and will be subject to approval from the DECC prior to implementation.

21.8 Cumulative and Indirect Impacts

76 *The Scottish Offshore Wind Farms – East Coast Discussion Document (2) – Approach to Cumulative Effects Assessment* (Royal Haskoning, 2010; see *Appendix 5B*) addressed the scope of cumulative effects assessments at a regional level. The document concludes that effects on other marine users, considering the distance between the offshore wind farms in the outer Forth and Tay, should be scoped out of regional cumulative assessment and can be dealt with at the Project level.

77 Provided that the Project is constructed, maintained and operated in accordance with the mitigation set out in this ES, no significant impact interactions are predicted for effects on any of the marine and coastal recreational users assessed in this chapter.

78 There is a potential for a cumulative Project impact on recreational sailing activities from the combined effects of the construction works within the Development Area and Offshore Export Cable Corridor and service vessels on cruising routes and on informal sailing activity (i.e. from the works required for the Development Area and Offshore Export Cable Corridor simultaneously). This effect is predicted to be moderate/major following mitigation but temporary in duration and limited to the busiest periods of Project construction (see *Section 7.10*). A similar short term but significant cumulative effect on recreational sailors would be predicted if the construction periods for the Project and Neart na Gaoithe Offshore Wind Farm overlapped, due to the potential for further increases in construction activity and vessel movements affecting cruising routes. Cumulative (Project) impacts on recreational diving, surfing or other coastal recreational uses are predicted to be minor/moderate.

79 No significant impact interactions have been identified for effects on military PEXA.

21.9 Mitigation

80 This section sets out committed mitigation measures which would be implemented to provide Additional Mitigation to the Embedded Mitigation measures described in *Section 21.3*. These Additional Mitigation measures are a direct response to the specific predicted effects of the Project on other human receptors and are therefore different from, and supplementary to, those assumed to be Embedded. Measures are set out below for each of the topics addressed in this chapter and apply to the Wind Farm and OfTW unless stated otherwise.

21.9.1 Marine Recreational Activity

81 The following measures will be adopted:

- provision of safety/exclusion zones around construction activities (500 m);
- regular amendments to relevant UKHO admiralty charts to mark the location of the WTGs, OSPs and subsea cable routes (also see mitigation in *Section 19.10*);
- regular Notice to Mariners will be incorporated into the design of the construction, major maintenance and decommissioning programmes to avoid disruption to RYA cruising routes and to minimise any navigational disruption along these routes; and
- a consultation strategy will be agreed with all relevant recreation groups, clubs and authorities to inform all key recreational users of the sea and coastline of the implications of construction, operation and maintenance of the development and to facilitate feedback in order to minimise disruption where possible.

21.9.2 Military Practice and Exercise Areas

82 The other human consideration assessment has assessed worst case scenario impacts of the Project in isolation and cumulatively.

83 Based on the outputs from this impact assessment, and the nature of any residual impacts, it has been concluded that the Embedded Mitigation detailed in *Section 21.3* is appropriate to reduce any potential impacts relating directly to an acceptable level. No Additional Mitigation is proposed for the Project, with respect to PEXAs.

21.10 Residual Impacts

84 A significant but short term impact (moderate/major) on recreational sailing has been predicted during the construction phase of the Offshore Export Cable. This recreational effect would be experienced particularly by those undertaking informal sailing in inshore waters and would be limited to the busiest periods of construction. Similarly, a significant short term cumulative impact is predicted on recreational sailing activities when the effects of construction of the Wind Farm and OFTW are assessed in combination, and should construction of the Neart na Gaoithe Offshore Wind Farm take place at the same time as the Project.

85 No other significant Project impacts, interactive impacts or cumulative impacts are predicted on marine recreational activities from the construction of the Wind Farm and OfTW in the Development Area, since these do not affect cruising routes and informal recreational sailing is more limited in locations further offshore.

86 No other significant impacts are predicted for the construction, operation, maintenance or decommissioning of the Project, alone or cumulatively, on other marine recreational activities (at sea or along the coast), or on military PEXA, subsea cables and pipelines or UXO. No other significant interactive or cumulative effects are predicted on the receptors associated with these topics.

References

East Lothian Council and Visit Scotland (2010). *South East Scotland Watersports Guide. 2nd Edition – Pocket Guide*. Available at: http://www.visiteastlothian.org/assets/watersports%20guide%202010.pdf [Accessed 2 November 2012].

Great Britain Parliament (2004). *Energy Act 2004*. Available at: http://www.legislation.gov.uk/ukpga/2004/20/contents

Royal Yachting Association (RYA) (2011). *Offshore Energy Developments: How has the RYA's involvement Safeguarded Recreational Boating to Date?* [Online] Accessed at: http://www.rya.org.uk/infoadvice/planning environment/offshorewindenergy/Pages/OffshoreEnergyDevelopments.aspx [Accessed 5 November 2011].

Royal Yachting Association (RYA) (2005). *UK Coastal Atlas of Recreational Boating*. Updated 2008. Southampton: RYA. GIS Shape Files dated 2010.

Royal Haskoning (2010). *Scottish Offshore Wind Farms – East Coast: Discussion Document (2) – Approach to Cumulative Effects Assessment*. Available at: http://77.68.107.10/Renewables%20 Licensing/MRP_NNG_Offshore_Windfarm/ES/Appendices/Appendix%206.3%20%20FTOWDG%20Discussion%20Document%202.pdf [Accessed 14 November 2012].

Surfers Against Sewage (SAS) (2009). *Guidance on Environmental Impact Assessment of Offshore Renewable Energy Development on Surfing Resources and Recreation*. Available at: http://www.sas.org.uk/wp-content/uploads/2012/04/eia-1.pdf [Accessed 5 November 2012].

SeaZone (2013). *SeaZone Mapping Catalogue*. [Online] Available at: http://www.seazone.com/index.php [Accessed 11 March 2013].

WWF (2006). *Tangle of the Forth*: *The Case for a Marine Act for Scotland*. Available at: http://www.wwf.org.uk/filelibrary/pdf/ tangleofforth01.pdf [Accessed 5 November 2012].