



European Offshore Wind Deployment Centre

Non-Technical Summary
Aberdeen Offshore Wind Farm Limited

Volume 1 of 4

July 2011

Introduction

This document is a Non-Technical Summary (NTS) of the Environmental Statement for the proposed European Offshore Wind Deployment Centre (EOWDC).

The purpose of this document is to provide an overview of the key findings of the offshore Environmental Impact Assessment undertaken by Aberdeen Offshore Wind Farm Limited (AOWFL).

This NTS provides the project details, including information relating to the scientific studies that have been undertaken and the key findings of these studies. For a more in depth evaluation of the information provided here please refer to the main Environmental Statement.

Aberdeen Offshore Wind Farm Limited (AOWFL)

This application is being made by Aberdeen Wind Offshore Wind Farm Limited (AOWFL). AOWFL is an established legal entity owned by Vattenfall Wind Power Ltd (VWPL) (75 %) and Aberdeen Renewable Energy Group (AREG) (25 %).

The project is being part-funded by a grant under the EU [Economic Recovery Programme in the field of Energy]. Consortium members in this grant action are AOWFL, VWPL, AREG and Technip UK Ltd.

Vattenfall

VWPL's ultimate holding company is Vattenfall AB (Vattenfall). Vattenfall is owned by the Swedish state. Vattenfall is Europe's fifth largest generator of electricity and the continent's largest producer of heat.

Vattenfall currently operates over 500 Mega Watts of onshore wind and almost 700 Mega Watts of offshore wind across northern Europe. This portfolio includes Kentish Flats Offshore Wind Farm and Thanet Offshore Wind Farm, both located off the UK's Kent coast.

Vattenfall is currently constructing Ormonde Offshore Wind Farm off Barrow-in-Furness which will be completed during 2011. An application to build Kentish Flats Offshore Wind Farm Extension is planned for August 2011. Vattenfall is also in partnership with ScottishPower Renewables to develop the Round 3 East Anglia Offshore Wind Farm. This project is expected to deliver around 7,200 MW of wind capacity which would provide clean electricity for the equivalent annual demand of around 4 million UK homes.

The north east of Scotland is an important region for VWPL with the planned EOWDC, the Clashindarroch onshore scheme, approved for consent in December 2010, and the planned Aultmore onshore scheme.

Aberdeen Renewable Energy Group (AREG)

AREG is an incorporated company representing the interests of over 170 member organisations. Established in 2001, AREG aims to ensure that Aberdeen City and Shire and its businesses play a major role in the energy revolution. AREG has been supported by the Energising Aberdeen Fund of Aberdeen City Council. The Fund represents a £22.25 million investment in the future of Aberdeen over five years by the Scottish Government.

Technip

Technip is a world leader in the fields of project management, engineering and construction, offering innovative solutions to the global oil and gas industry.

With 23,000 employees, integrated capabilities and proven expertise in underwater infrastructures, offshore facilities and large processing units and plants on land, Technip is a key contributor to the development of sustainable solutions for the energy challenges of the 21st century.

Through its Aberdeen based operating centre, Technip provides best-in-class subsea products and services to oil and gas companies operating offshore in the UK, Denmark, the Netherlands and West Coast of Ireland. Further to its established subsea business, Technip is rapidly developing capability to support the growing offshore wind sector.

Project Details

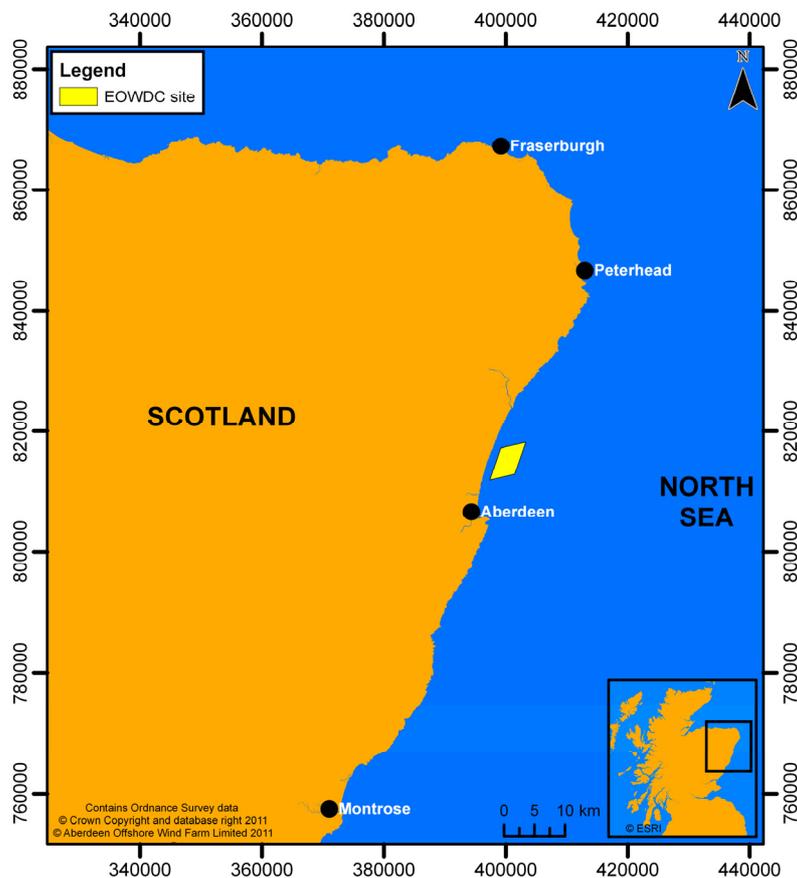
The proposed EOWDC is an innovative offshore wind turbine deployment facility proposed off the Aberdeenshire coast.

The project is part-funded by the European Union under the European Economic Plan for Recovery in the field of Energy. In December 2010 a grant of up to 40 million Euros was awarded to the EOWDC project by the European Union (EU) as part of wider proposals to invest in key energy projects throughout Europe. The vision of this project is:

“To deploy new equipment, systems, processes, and initiate R&D to improve the competitiveness of offshore wind energy production, whilst generating environmentally sound, marketable electricity and to increase the supply chain capabilities in Scotland, the wider UK and Europe.”

The Applicant was awarded a lease for the seabed from The Crown Estate earlier this year. The project consists of up to 11 wind turbines with a maximum power generation of up to 100 Mega Watts. The wind turbines would export the electricity onshore to a new substation and then to the National Grid. Additional onshore facilities may include a deployment centre with a research and development centre.

Location of the Proposed European Offshore Wind Deployment Centre



The onshore works associated with the proposed EOWDC would be subject to a separate planning application later in 2011 but are likely to be:

- a small substation
- underground cables connecting the wind turbines to the substation
- possible research and development facilities next to the substation

Key Project Characteristics	
Maximum EOWDC capacity	100 Mega Watts
Maximum Number of Wind Turbines	11
Approximate Distance from EOWDC to Shore	2.4 kilometres
Water Depth across the Wind Turbine Locations	20 metres to 30 metres below Lowest Astronomical Tide
Maximum Rotor Diameter	150 metres
Maximum Hub Height	120 metres
Maximum Tip Height	195 metres
Minimum Clearance Above Sea Level	22 metres above Mean High Water Spring level (MHWS)
Indicative Spacing between Wind Turbines	Between 790 metres and 1,050 metres
Foundation type	There are currently five options: Monopile Gravity Base Tripod Steel Jacket Suction Caisson / Bucket
Inter array Cables	Maximum number of 12 Total length of 13 kilometres
Export Cables	Maximum number of four would run from the wind turbine array back to Mean High Water Spring (MHWS) Total length of 26 kilometres

Regulatory Consents and the Purpose of the Environmental Statement

A number of regulatory consents are required for the construction and operation of the proposed EOWDC.

The following consents will be applied for:

- consent under Section 36 of the Electricity Act 1989 (as amended), for the installation of any offshore generating station with a permitted capacity of 1 Mega Watt or above
- a Marine Licence, established via the Marine (Scotland) Act 2010

Marine Scotland and Scottish Ministers will be responsible for determining the outcome of the application process.

In addition consents will be required for onshore work associated with the EOWDC development. This will be a separate application due later in 2011.

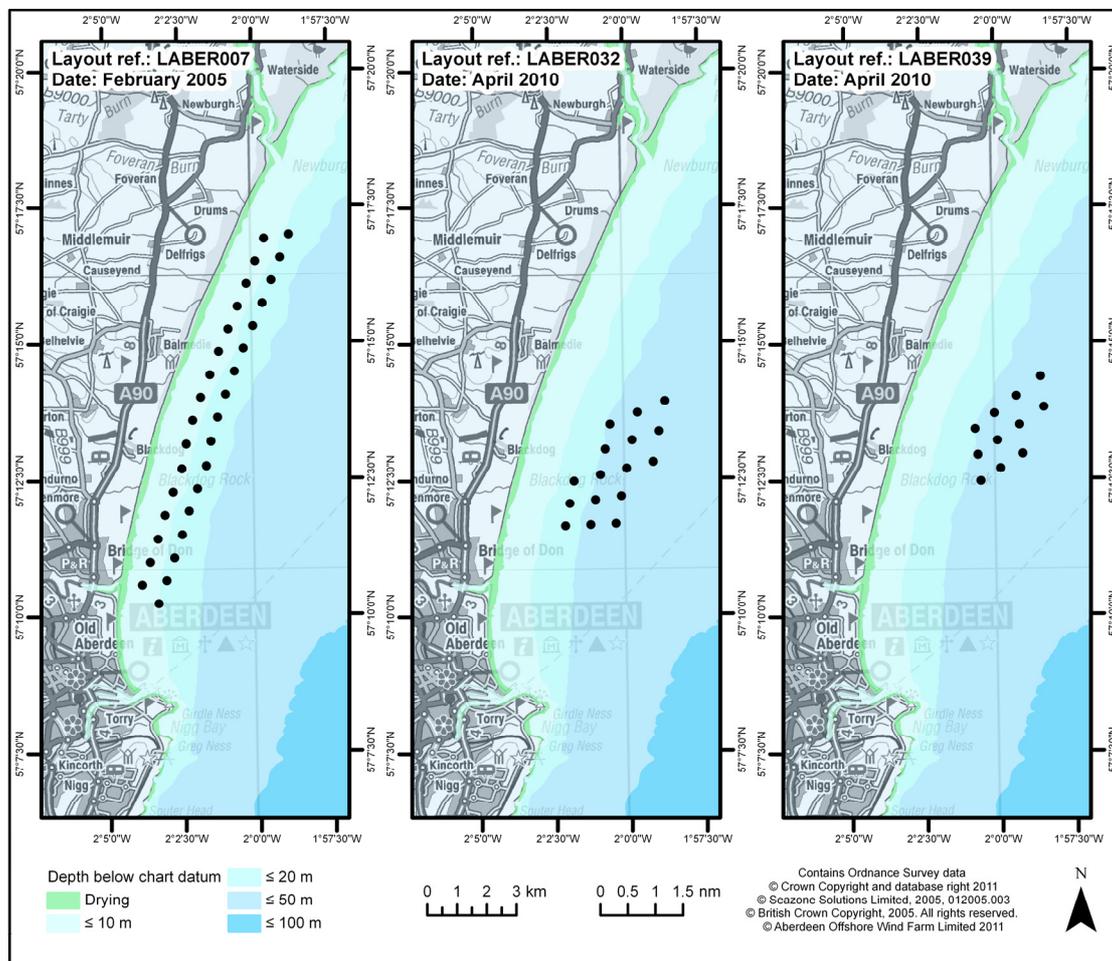
Site Selection and Alternatives

The proposed EOWDC site location has undergone a number of changes that have been determined through a long process of examining the constraints, undertaking consultations, and conducting surveys, studies and assessments.

These changes have primarily been a result of consultation with Aberdeen Harbour Board, the aviation industry, the Ministry of Defence and key environmental stakeholders.

Examples of the numerous site iterations can be found below. Further details are described within the Environmental Statement.

Three Site Iterations from 2005 and 2010 Including the Final Iteration from April 2010



Environmental Impact Assessment

Environmental Impact Assessments were undertaken in order to assess the possible impacts that the proposed EOWDC might have upon the local physical, biological and human environment.

To account for all possible scenarios a worst case impact has been assessed for each study. This ensures that any possible negative impacts upon the environment resulting from the development of the EOWDC would never be more than, and are likely to be less than, the findings of the Environmental Impact Assessment.

Where it is possible that there would be a negative impact upon the environment appropriate mitigation is suggested. The purpose of mitigation is to reduce the level of impact, for example this could be by following specific guidelines or not constructing at certain times of the day.

The key findings of the Environmental Impact Assessment are presented within this Environmental Statement.

Wind Turbines Awaiting Installation at the Ormonde Offshore Wind Farm (Copyright Tony West Photography)



Scoping, Consultation and Public Exhibitions

Public exhibitions have played an important role in informing and communicating with the population of Aberdeen and the wider area. A number of exhibitions have taken place since 2005, most recently in November 2010.

In 2010 public exhibitions were held between 22 and 26 November in:

- The Palace Hotel, Peterhead
- Udney Arms Hotel, Newburgh
- Kirk Centre, Ellon
- Beach Ballroom, Aberdeen
- White Horse Inn, Balmedie

Shortly after the Section 36 and Marine Licence applications are submitted for the proposed EOWDC further exhibitions will be held to give members of the public and interested organisations an opportunity to ask questions about the project and review the outcome of the various environmental studies.

Physical Environment

Coastal Processes

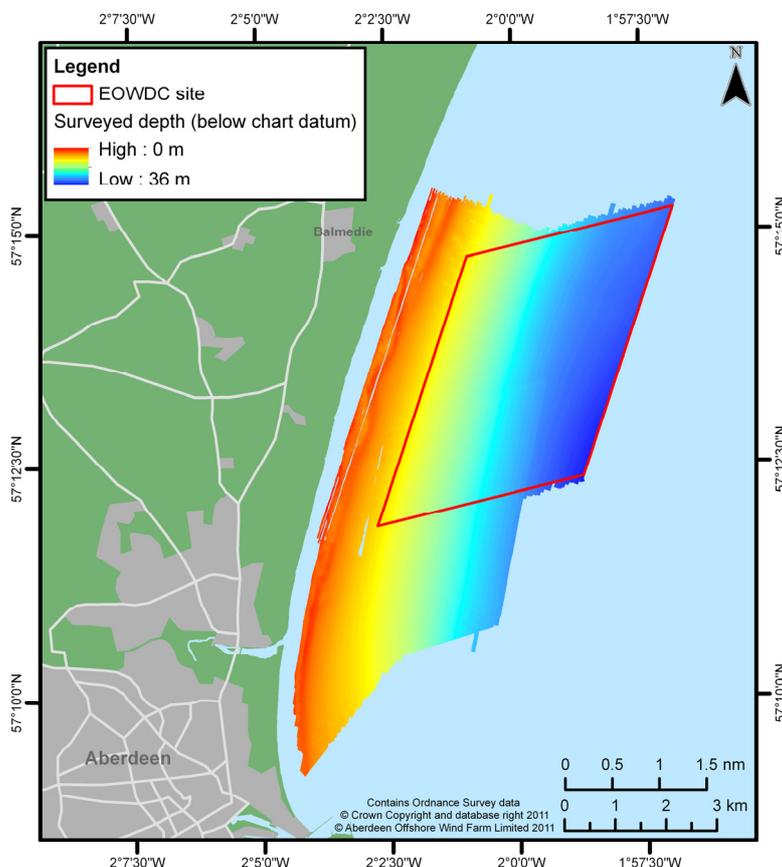
The assessment includes consideration of the potential changes to geology, waves, currents, sediment, seabed features and water quality.

Studies have provided an assessment of the potential impacts of the proposed EOWDC development within Aberdeen Bay upon the existing coastal processes. To assess the potential impacts relative to the baseline (existing) coastal environment, qualitative assessment of site data, empirical evaluation and detailed numerical modelling have been used.

It is shown that the majority of potential impacts can be considered of negligible significance. The impacts that have been assessed as minor are scour (natural removal of sediment around wind turbine foundations), increase in suspended sediment as a result of foundation and cable installation and removal activities, and changes to processes maintaining the Aberdeen Bay coastline as a result of the presence of turbine foundations.

Mitigation is not considered necessary except for the case of scour where scour protection measures are advised (this could include material being placed in the sea bed surrounding the wind turbine).

Geophysical Assessment Results Showing Depth of Aberdeen Bay



Biological Environment

Designated Sites

There are no designated sites of local, regional or national importance within the lease boundary for the proposed EOWDC.

Potential impacts upon designated sites within close proximity to the proposed EOWDC have been assessed within the Environmental Impact Assessments.

Ornithology

Three different types of ornithological surveys have been undertaken since 2005. The results from these surveys along with additional information have been used to help inform the Environmental Impact Assessment.

A total of 79 species of birds were recorded during ornithological surveys. Thirty seven of these species were either a qualifying species for a Special Protection Area (protected sites for rare or vulnerable birds) or were recorded in numbers that could be of concern should there be an impact from the proposed EOWDC development. These 37 species were assessed in detail.

Possible impacts to birds could include displacement and disturbance effects throughout the construction, operation and decommissioning stages.

For the majority of species the impact from the proposed EOWDC is deemed to be negligible. However, for some species, such as the red throated diver, the impact is deemed to be minor or moderate.

Possible mitigation for these impacts could include minimising vessel movements by using existing shipping lanes, avoiding significant piling operations during periods of high seabird sensitivity and minimising use of lights.

Razorbills Were Frequently Spotted Throughout the Survey Area



Marine Ecology

Desk top review and survey work have been undertaken in order to assess the possible environmental impacts of the proposed EOWDC on the marine ecology of the area.

The majority of the site is covered by fine well sorted sands and fine muddy sands. The most common species at the site are worms and shellfish. On the seabed brittle stars, brown shrimp and swimming crabs are common whilst fish species in the area are predominantly made up of plaice, dab, hooknose and whiting.

Possible impacts to species in the area include temporary loss of and disturbance to the seabed, resuspension of sediment and effects generated from electromagnetic fields from subsea cables.

Overall the impacts have been assessed as being negligible to minor with the exception of the worst case impact from construction noise upon fish which is considered to be of minor to possibly moderate significance. Possible mitigation could include a 'soft start' procedure. During this procedure noise from construction begins quietly, allowing for fish (or marine mammals) to leave the area before the noise becomes too loud.

Marine Mammals

Boat based surveys, land based vantage point surveys and desk top review were used to inform the marine mammal Environmental Impact Assessment.

A number of marine mammals make use of Aberdeen Bay throughout the year; the more commonly sighted species are the harbour porpoise, bottlenose dolphin and grey and common seal.

Marine mammals can be affected by impacts such as physiological damage from construction noise, exclusion of the site during construction and suspended sediment levels. These impacts have been assessed as being of negligible to minor significance.

In some instances behavioural disturbance and displacement during possible construction activities is considered to be of moderate to potentially major significance.

A number of mitigation strategies have been suggested in order to minimize any impacts upon marine mammals. A Marine Mammal Protection Plan (MMPP) would be developed to address and mitigate any of the impacts identified as being of concern. The final MMPP would be developed in consultation with advice from statutory consultees. The applicant would follow any advice provided by Marine Scotland on the European Protected Species licences to apply for, if these are required.

Grey Seal Swimming in Aberdeen Bay



Human Environment

Commercial Fisheries

Desk based review and thorough consultation with the Scottish Fishermen's Federation (SFF), local fishermen and the District Fishery Officer provided information to inform the Environmental Impact Assessment.

Commercial fishing activities in the area surrounding the proposed EOWDC are considered to be at relatively low levels. Potting for crab and lobsters; trawling for whitefish; and dredging for scallops account for the majority of the activity.

It is understood that at the time of writing only four, 11 metre and under trawlers actively fish in the area of the site. Whilst larger trawlers operating out of Aberdeen may transit through the site, the area is not sufficiently productive to justify such vessels actually fishing within it.

Given the limited number of wind turbines proposed, the small area of the site and the low level of fishing activity within it, the overall impacts on commercial fishing are expected to be negligible, although for a small number of local vessels, the potential impacts may be of moderate significance. It is expected that fishing would be able to continue within the proposed EOWDC during operation which should help to mitigate this impact.

24 metre Vessel fishing in Barrow Offshore Wind Farm (Copyright Brown and May Marine)



Salmon and Sea Trout

Extensive consultation was undertaken to inform this assessment. Meetings were held with all the salmon fishery boards located within the north-east region of Scotland and with representatives of the netting fishery.

Scottish salmon populations are recognised as being of national and international importance. In addition to their ecological value, salmon and sea trout are species of importance from a socioeconomic perspective.

Potential impacts upon local salmon and sea trout populations arise from the noise and vibration associated with the development of the site, increased suspended sediments, electromagnetic fields generated from subsea cables and the physical presence of the wind turbines.

The majority of impacts have been assessed as having negligible impact although it is possible that construction activities could have a negligible to minor impact following mitigation. Mitigation could include specific scheduling of construction periods so that peak times of salmon entering or exiting local rivers are not affected. Further consultation will be held with statutory consultees and salmon fisheries boards when construction methods and timing are considered further.

Seascape, Landscape and Visual Character

Site specific desk studies, field work and consultation with local Councils and statutory consultees have helped to inform the Environmental Impact Assessment process. The area within a 40 kilometres radius of the development was used for assessment.

Many possible receptors were identified including residential communities, road, rail and ferry users, sailing and boating users and National Trails and National Cycle route users. Numerous potential impacts were identified but only a limited number were considered to be significant.

The visual impact on Aberdeen is limited by the densely built up nature of the city. The significant number and diversity of built elements along the coastline would also help to absorb the visual profile of the proposed wind turbines.

The overall visual effect is therefore considered to be moderate to major with only localised and isolated areas of more significant effect. These significant effects are described in further detail within the Environmental Statement.

The proposed European Offshore Wind Deployment Centre as seen from Aberdeen Beach (image is for illustrative purposes only as not to scale). A full size representation of this photomontage is available in Volume 4 of the Full Environmental Statement found on the DVD at the back of this document.



The proposed European Offshore Wind Deployment Centre as seen from Balmedie Beach (image is for illustrative purposes only as not to scale). A full size representation of this photomontage is available in Volume 4 of the Full Environmental Statement found on the DVD at the back of this document.



Shipping and Navigation

Site surveys, desk based review and consultation have helped to inform a full Navigational Risk Assessment (NRA) for the proposed EOWDC. The NRA provides background information on local commercial and recreational navigational issues and then assesses the potential impact that the proposed EOWDC development could have upon local navigation.

A number of potential impacts were identified, the majority of these are considered to be negligible or cause no impact. Compared to the marine accident risk levels in the UK, the increase in risk to both people and the environment caused by the proposed EOWDC is low.

Extensive consultation with Aberdeen Harbour Board (AHB) and key consultees has resulted in a number of changes being made to the site layout. Recent consultation has indicated that the current site is acceptable and all hazards were identified to be low.

The Passenger Ferry Hjaltland Passes by the Proposed European Offshore Wind Deployment Centre Site during One of the Five Marine Traffic Surveys Undertaken

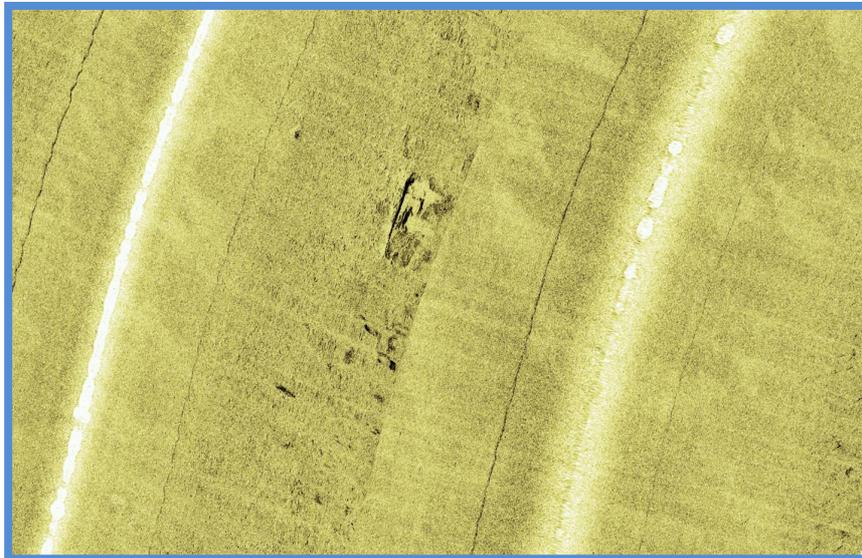


Maritime Archaeology

A maritime archaeological assessment was carried out via consultation with relevant bodies, a full desk top review, and a thorough examination of geophysical information collected for the site.

The geophysical survey has identified several anomalies which may be man-made or natural features. Of these a potential impact has been predicted for one unidentified wreck which lies in close proximity to Wind Turbine 8. The proposed mitigation for this wreck is an exclusion zone to ensure there are no impacts upon this potentially valuable site. After mitigation the impact has been assessed as of minor significance.

Geophysical Evidence of the Unidentified Wreck by Wind Turbine Location 8 (Copyright Wessex Archaeology (2011), Data Supplied by Osiris Projects, 2010)



Cultural Heritage

Site survey and desk based review have been used to assess the potential impact that the proposed EOWDC could have upon the setting of all nationally important designated cultural heritage assets within 10 kilometres of the wind turbines and selected assets beyond this limit.

Potential impacts have been identified in five cases: Torry Battery (Scheduled Monument), Peterseat Cairns (Scheduled Monument), Hare Cairn (Scheduled Monument), Orrok House and Girdle Ness Lighthouse (Grade A-listed buildings). The impacts have been assessed as being of minor significance with the exception of Girdle Ness Lighthouse for which the impact is considered of Minor to Moderate. No mitigation is proposed in relation to these impacts, they would persist throughout the lifetime of the EOWDC and end upon decommissioning.

Aviation Radar

In order to address any potential aviation issues that could arise from the proposed development an Aviation Working Group was established in 2005.

Possible impacts to aviation included changes to helicopter routeing and impacts upon local radar facilities.

Early and ongoing consultation has helped all parties to move forward together with these issues. The Applicant has entered a contract with National Air Traffic Services Limited in order to apply for an Air Space Change. This would be implemented by NATS, in consultation with the Aviation Working Group. The Applicant is also currently negotiating a contract with NATS to determine the most efficient and effective technical solution to overcoming any primary and/or secondary radar issues.

Ministry of Defence

Consultation with the Ministry of Defence has been ongoing since 2005. Two possible impacts have been highlighted, these are the effect of the wind farm on the operability of the defence radar installation at Peterhead and the possible effect to the Black Dog Firing Range – a small-arms firing range on the coast nearby.

The project has had a long-term relationship with the MoD during its development, through the MoD Defence Estates department in Birmingham. The Applicant understands that plans for the area of the Black Dog Firing Range are acceptable, although further discussions will be needed on operational aspects. There will now need to be an intensive period of work to address recent MoD concerns regarding the Peterhead radar issue.

Unexploded Ordnance (UXO)

Although not a statutory requirement, given the history of Aberdeen during World Wars One and Two and the presence of local MoD facilities the risk of encountering unexploded ordnance has been assessed.

Between 2007 and 2010 three studies were undertaken to inform the project on the risk of UXO across the site. The conclusion of the latest assessment in 2010 was that the main ordnance threat was due to the Black Dog Firing Range. Outside this area there is a low UXO risk to the development of the proposed EOWDC.

Other Marine Users

The proposed EOWDC has the potential to impact a variety of other marine users such as surfers and recreational sailors. Most impacts are anticipated to be negligible.

Through consultation with the Royal Yachting Association two potential impacts on recreational sailing have been identified: impacts to navigational safety and loss of routes and sailing and racing areas. Such impacts can occur during construction, operation and decommissioning of the development. After mitigation such as the enforcement of safety zones it is anticipated that these impacts would be of negligible significance.

Surfers Enjoying the Scottish Coast



Socioeconomics, Recreation and Tourism

Through a process of thorough consultation and desk based assessment the potential socioeconomic, tourism and recreational impacts of the proposed EOWDC were assessed.

Consultees felt that the project would play a significant role in supporting the development of the offshore renewables industry including research and development. Impacts resulting from the project were for the majority moderate (positive), with no impact falling below negligible.

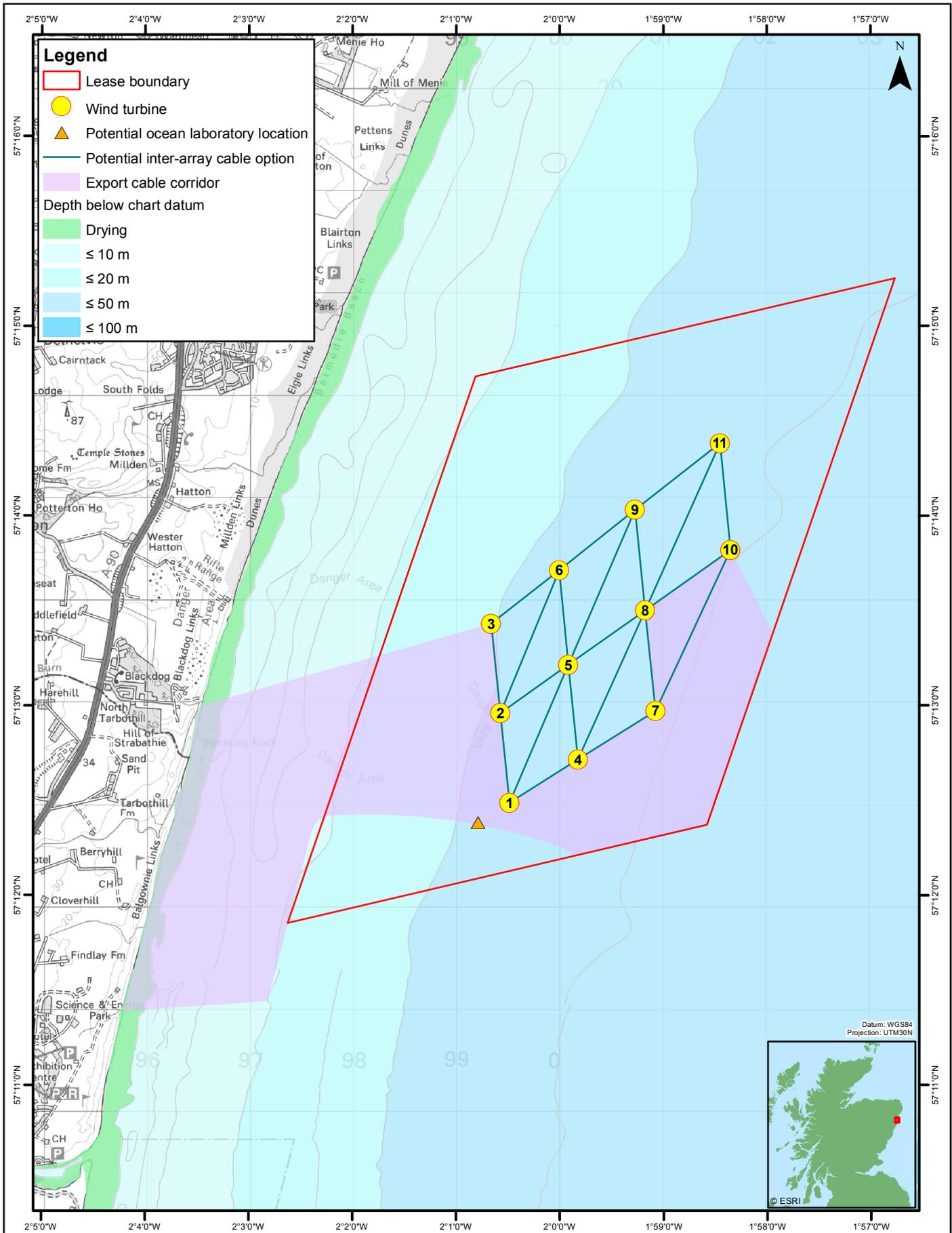
The impact of the proposed development on tourism and recreation is considered to be of negligible significance.

In Air Noise

Background noise measurements and wind speeds were measured on site over a period of 3 weeks. Consultation was carried out with the local authorities and key guidance documents were also used for the assessment.

The noise impact from the construction, operation and decommissioning of the proposed EOWDC on residential properties was assessed using suggested national limits as well as more stringent local noise limits.

The operational noise was assessed as being of negligible significance. For the noise associated with the construction of the proposed EOWDC it is anticipated that the impact during the day would be of minor significance. For night time hours mitigation suggests that certain construction activities are not carried out during this time, this resulting in a negligible significance.



Legend

- Lease boundary
- Wind turbine
- ▲ Potential ocean laboratory location
- Potential inter-array cable option
- Export cable corridor

Depth below chart datum

- Drying
- ≤ 10 m
- ≤ 20 m
- ≤ 50 m
- ≤ 100 m

0 0.5 1 km
 0 0.25 0.5 nm

Original A4 Plot Scale
 1:50,000

**European Offshore
 Wind Deployment Centre
 Site Layout**



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Layout	By	Date	Rev	Dwg No.
LABER039	LH	21/06/2011	A	6129-530-PA-088

Figure 1

www.vattenfall.co.uk/en/aberdeen-bay.htm

VATTENFALL



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Aberdeen Renewable Energy Group



A project part-funded by the European Union under the European Economic Plan for Recovery in the field of Energy