

Thanet Offshore Wind Farm Decommissioning

Summary of Environmental Impact

Thanet Offshore Wind Ltd

18th May 2007

Final Report

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1 INTRODUCTION AND BACKGROUND

Thanet Offshore Wind Limited (TOW) was created to develop opportunities for energy generation from renewable resources in the Thanet area. TOW was awarded the rights to develop an offshore wind farm in the Thames Estuary Strategic Environmental Assessment (SEA) area in 2003, by The Crown Estate under Round Two of the offshore wind licensing arrangements. The award was subject to TOW being successful in gaining the necessary consents for the construction, operation and decommissioning of the wind farm.

The Environmental Statement (ES) produced for the Thanet Offshore Wind Farm in November 2005¹ focused on potentially significant impacts that could arise as a result of the construction and operation of the offshore wind farm. As part of that process a Decommissioning Plan was outlined and the environmental impacts that might arise during the decommissioning phase of the project were assessed and consulted on.

As indicated in the Guidance Notes issued by the DTI in December 2006² (in paragraph 5.10 on pg. 13 and in Annex E on pg. 66), it is now necessary for an Environmental Impact Assessment (EIA) to be included in the Decommissioning Plan prepared prior to construction.

This Decommissioning EIA is based on the analysis already undertaken for the construction and operational phases, and therefore, refers heavily to the assessments made at the time. The decommissioning EIA will then be reviewed towards the end of the life of the installation and a more detailed assessment undertaken, to produce a final EIA.

A description of the proposed Thanet Offshore Wind Farm (Thanet) project is discussed in **Section 3.0** of this Decommissioning Plan. Further details on the project components are discussed in Section 2 of the 2005 ES. A summary of the key project characteristics is provided below in **Table 1**.

¹ Royal Haskoning (2005). *Thanet Offshore Wind Farm Environmental Statement*. Produced for Thanet Offshore Wind Limited

² DTI (2006). *Decommissioning of Offshore Renewable Energy Installations under the Energy Act 2004*. Guidance Notes for Industry.

Table 1 Summary of the key project characteristics

Key project characteristics	
Hub height and blade length	70m hub height, 45m blade length, 115m total above mean sea level
Minimum clearance above sea level	22m above mean high water springs level (MHWS)
Nominal output of each wind turbine	3.0MW _e
Nominal maximum output of the wind farm	300MW _e
Minimum separation between turbines	450m within rows 675m between rows
Total wind farm area	35km ²
Minimum distance to shore	11.3km
Minimum distance to nearest residence	11.5km
Location of export cable landfall	Northern part of Pegwell Bay
Electrical connection	Existing substation at Richborough Power Station

The overall decommissioning programme is outlined in the Decommissioning Plan, in **Sections 4** and **5**.

Full decommissioning of the project is not expected before 2049, assuming that removal of the wind turbine generators (WTGs) takes place as expected after its design operational life of 40 years (with an expected repowering of the WTGs after 20 years). The final scope of the decommissioning works will be determined by the legislation in place at the time but currently this involves the removal of the accessible installed offshore components of the wind farm.

An assessment will be made immediately prior to decommissioning to establish if the removal of any external cable protection (used at cable crossings) and unburied cable would potentially cause more damage to the environment. It is possible that these features will have formed artificial reefs and as such may be better left in place and undisturbed.

The following sections discuss the potential impacts of the decommissioning of these various components on the environmental parameters discussed in the original ES of November 2005.

2 SUMMARY OF POTENTIAL IMPACTS

2.1 Introduction

This section describes the potential impacts of the decommissioning phase of the Thanet project for each environmental parameter as addressed in the 2005 ES.

2.2 Hydrodynamics and Geomorphology

It is not expected there would be any significant broad-scale or long-term impacts on seabed or coastal processes arising as a result of the decommissioning activities detailed in this document. Locally, any scour pits that have formed at the base of the pile foundations will fill naturally back to the surrounding seabed level after the removal of the piles. Where and if scour protection is removed, then any disturbed areas would also be expected to fill naturally. Rapid seabed recovery to the ambient conditions would be expected and the overall impact would be of **negligible** significance.

There may be limited short term, highly localised increases in suspended sediment levels due to seabed disturbance during foundation and any cable/scour protection removal. Against naturally occurring background turbidity in the Thames Estuary SEA area, the impact of this localised increase will be **negligible**.

2.3 Marine and Coastal Water Quality

Resuspension of sediment has the potential to impact upon water quality, especially where the volumes released are high and/or the sediment contains contaminants. During the decommissioning phase, such sediment release is expected to be highly localised and transitory in nature. The seabed sediments within the area likely to be affected by the decommissioning are not considered to contain substances that may adversely affect water quality (see Section 9 of the 2005 ES). It is anticipated that there will be **no impact** on marine water quality due to increased suspended sediment levels.

In the coastal and intertidal zone, as the export cables are expected to be left in situ, there would be **no impact** on the area of Pegwell Bay designated under the EU Shellfish Waters Directive (79/923/EEC) and **no impact** in relation to the EU Bathing Waters Directive (76/160/EEC).

There is the potential for pollution from spills or leaks of fuel, oil and construction materials during the decommissioning period. The decommissioning contractor will be expected and contractually obliged to follow best working practice during all offshore operations. An Environmental Management Plan (EMP) will be produced as part of the contract documents to ensure that all potential sources of pollution are identified and that measures are taken to limit the potential for a pollution incident to occur and to rapidly respond to any accidental release, however unlikely. These measures, combined with the diluting and dispersive nature of the receiving environment will result in a potential impact of **negligible** significance.

2.4 Ornithology

Seabirds observed in the site at varying densities included *inter alia*, red-throated diver *Gavia stellata*, fulmar *Fulmarus glacialis*, gannet *Morus bassanus*, guillemot *Uria aalge*, razorbill *Alca torda*, kittiwake *Rissa tridactyla*, several gull species, common tern *Sterna hirundo*, sandwich tern *Sterna sandvicensis* and common scoter *Melanitta nigra*. Any impacts on these species during decommissioning are anticipated to be similar to the construction impacts associated with the Thanet project, as discussed below.

2.4.1 Disturbance to and displacement of feeding seabirds

The noise levels and presence of a variety of vessels and other machinery associated with the decommissioning of the Offshore Substation and WTGs are likely to impact on the normal use of the site by the seabird species found there. Any impacts would be short term i.e. less than six months, and given the overall low densities of birds observed throughout the year and availability of significantly better feeding areas close by, any impacts are considered to be short term and of **minor adverse** significance.

2.4.2 Disturbance and displacement of waterfowl along the export cable route

The export cables will be left in-situ and, therefore, there will be **no impact** on the Thanet Coast and Sandwich Bay Special Protection Area (SPA) and associated species.

The impacts due to the removal of any scour protection would be temporary and local, and would have **no impact** on ornithological interests.

2.4.3 Collision risk

Although the probability of any birds colliding with immobile structures is considered to be very low, the removal of the WTG structures will provide a **negligible** impact to the birds that persist in the wind farm area.

2.5 Marine Ecology

2.5.1 *Sabellaria spinulosa*

The benthic surveys from the 2005 ES demonstrated that *S. spinulosa* occurs in moderate to low density patchy growth over much of the southern part of the Thanet site, with some areas of high density *S. spinulosa* growth occurring in the southern area.

TOW is committed to monitoring the development of the benthic community, particularly *S. spinulosa*, within the wind farm area. If the monitoring shows colonisation of the foundation structures or scour protection mattresses and their surrounding area that would be significantly impacted by the removal of the structures then it may be possible to agree a decommissioning programme that allows for structures to remain on the seabed. This option will be particularly relevant in the southern section of the site.

It is anticipated that the *S. spinulosa* population will continue to increase in extent and density over the lifetime of the wind farm and that significant reef structures will have the potential to form. Removal of the foundations or scour protection in these reef areas (if

present) may have an **adverse** impact on any *S. spinulosa* reef aggregation in the immediate area surrounding the structure, the significance of which will depend on the extent and level of disturbance. It will be necessary to adopt an approach to decommissioning that makes the wind farm area safe for users of the sea, whilst also maintaining the extent and distribution of any *S. spinulosa* aggregations considered to be of importance to nature conservation. It is anticipated that pre-decommissioning surveys will be carried out to assess the level of impact and need for mitigation.

2.5.2 Benthic communities

It is expected that a fouling community will develop on any submerged structures associated with the wind farm. Over time, this community may begin to represent an ‘artificial reef’, providing feeding and refuge potential to a range of sedentary and mobile species. The removal of these structures will represent a localised decrease in biodiversity. However, the decommissioning represents a return of the wind farm to natural conditions and the removal of an essentially ‘alien’ substrate, in the context of the wider environs. Monitoring of the benthic assemblage will be carried out during an agreed period of the operational phase of the Thanet project. Assuming that species of importance to nature conservation are not found to be reliant upon the wind farm structures a **negligible** overall impact would be anticipated as a result of decommissioning. Where it is considered that the fouling community should be preserved, TOW will work with the Regulatory Authorities, Natural England and CEFAS to determine an appropriate approach to decommissioning.

2.6 Natural Fish Resources

2.6.1 Impacts due to noise and vibration

The noise and vibration associated with the decommissioning process will be largely similar to that experienced during construction, such as increased vessel movement, jack-up operations etc. The major difference, however, is that decommissioning does not require pile driving and therefore impacts of significance during the construction phase, such as disturbance to herring spawning areas will not apply. Any noise will be limited in frequency, duration and extent and will only cause a temporary displacement of fish from the immediate area. As such, the potential impact of increased noise and vibration on the natural fish resource is considered to be of **negligible** significance.

2.6.2 Impacts due to disturbance of habitats

Decommissioning will have an impact on seabed habitats of similar, but lower overall magnitude to the construction process. As such, it is anticipated that the impact on fish species in terms of temporary displacement from seabed habitats will be localised and short in duration. Fish would be expected to readily return to the area once the decommissioning vessels have moved on. The disturbance of the seabed may attract fish to the impacted area, as it is likely that there will be improved foraging opportunities caused by the disturbance.

The loss of the offshore structures and associated fouling communities means that the area will lose its attraction as a refuge for fish. This decrease in the aggregating potential of the wind farm will lead to a decrease in the number of fish present, and particularly the gadoid species that are the most attracted to upright structures.

This loss of habitat, however, will not act to either increase or decrease overall fish productivity and biomass in the Thames Estuary SEA area. As such, the loss of habitat associated with decommissioning is considered to be of **negligible** significance to the natural fish resource.

2.7 Marine Mammals

Marine mammals are likely to be affected by noise and increases in vessel traffic and collision risk during the decommissioning phase. As explosives will not be used during the decommissioning of the wind farm, potential impacts on cetaceans and seals will be much lower than those during construction. There is limited knowledge on the effects of such noise on marine mammals; however, as no piling will take place during decommissioning the impacts of noise will be significantly less than those that are anticipated to occur during construction. Overall, it is considered that noise associated with decommissioning activities will have a **negligible** impact on marine mammals.

Although ship collisions with cetaceans and seals are a distinct possibility, the low frequency of seal and cetacean activity in the Thanet area, and their relatively small size and high manoeuvrability, suggests that the incidence of such events is very unlikely. The overall significance of this impact is, therefore, considered to be **negligible**.

2.8 Commercial Fisheries

2.8.1 Increased risk of seabed obstruction

A survey of potential seabed obstructions will be carried out as part of the decommissioning phase and will be observed by a fisheries representative. Where possible, obstructions will be removed. Where this is not possible, the obstructions will be notified on Admiralty Charts and in Notices to Mariners and the Kingfisher Information Service. Overall, the impact of seabed obstruction associated with the decommissioning of the wind farm is anticipated to be of **negligible** significance.

2.9 Seascape and Visual Assessment

There will be limited visual impact associated with decommissioning activities, which will be similar to that of the construction phase (i.e. presence of large vessels and general increased activity). As the anticipated length of the decommissioning programme will be less than for the construction phase, these impacts will be more temporary than for the construction period and are considered to be **negligible**.

The effect of vessels and the progressive removal of the WTGs and Offshore Substation will form the main impact during the decommissioning phase. However, it is anticipated that there will be **no impact** on any seascape character or viewpoints once the structures above the MHWS are removed. It is anticipated that the decommissioning programme will last approximately six months, and any impacts will be temporary in nature.

The loss of the wind farm on the horizon of sensitive viewpoints after a period of 40 years will impact on the observer, based upon the largely subjective values of the individual. Overall, an impact of **negligible** significance is anticipated.

2.10 Shipping and Navigation

The eventual decommissioning of the wind farm and the clearance of the site will be a reverse of the construction process and there will be similar requirements in terms of vessel movements.

Decommissioning is expected to take approximately six months and, during that time, the activities will lead to additional vessel movements in the area. This is expected to vary from small workboats, tugs and barges to large jack-up crane barges and Heavy Lift Vessels (HLVs). It is anticipated that much of the decommissioning equipment could come directly to the site from continental ports; however, it is possible that the Port of Ramsgate could be used as a support centre for small vessels. The peak increase in traffic is expected to be up to 20 to 30 vessels and it is considered that this will not cause a significant increase in risk, as they will be under the direction of the Marine Supervisor for the project.

Given the use of Notices to Mariners and adherence to international collision regulations the temporary increase in vessels at and transiting to the site is expected to be of **negligible** significance.

2.10.1 Export Cables

All buried cables are expected to be left in situ, as described in **Section 5** of the Decommissioning Plan, and therefore **no impacts** will arise during the decommissioning phase.

2.10.2 Navigation Risk Assessment

Table 3 shows an extract from the top ranked risks during the decommissioning phase to illustrate the high individual scores that need mitigation, even though the overall risk falls within As Low As Reasonably Practicable (ALARP). A full description of how the risks are scored and ranked is included in Section 14 of the Environmental Statement submitted in November 2005.

Table 3 Decommissioning ranked hazard risk

Hazard Detail	Risk By Consequence Category								Risk Overall
	Most Likely				Worst Credible				
	People	Property	Environment	Business	People	Property	Environment	Business	
Dropped major item during decommissioning operations	6	6	0	3	7	7	0	6	5.59
Member(s) public involved in accident	6	0	0	0	9	0	0	6	5.16
Accident involving leisure craft sightseers	6	0	0	0	9	0	0	6	5.16
Decommissioning vessel encounters existing underwater cables	0	7	0	3	0	7	0	3	5.07
Aircraft hits wind turbine blades or tower and crashes	3	6	2	5	5	5	1	5	4.81
Helicopter crashes onto decommissioning vessel	6	6	2	5	5	5	1	4	4.9
Decommissioning vessel collides with a fishing or recreational vessel	6	3	0	3	6	3	2	5	4.78
Decommissioning vessel collides with a fishing or recreational vessel	6	3	0	3	6	3	2	5	4.78
Vessel collides with tower while navigating	3	6	3	0	5	5	3	3	4.54
Person in water requires rescue	6	0	0	6	6	0	0	3	4.29

The highest risk number assessed, 5.59 is within the ALARP range. Although the overall risk numbers fall in the ALARP range, there are a number of individual items that score in the 7 to 9 range where some consideration for additional mitigation will be necessary.

In each case where the individual assessed risk has scored 7 and above, mitigation would be considered. The table highlights the risk to people if there was an accident involving leisure craft/sightseers at the decommissioning site. It is anticipated that TOW will apply to the Secretary of State for the implementation of Safety Zones of 500m around each offshore structure for the decommissioning phase. Additional mitigation measures will include publicising the dangers by issuing notices to local clubs and sailing organisations.

2.11 Marine Archaeology

No additional impacts over and above those experienced during the construction phase are anticipated as additional areas of the seabed will not be disturbed by decommissioning activities.

As per the construction phase, Exclusion Zones will be applied during the decommissioning phase to prevent damage to known wreck sites and geophysical anomalies with archaeological potential. If plans cannot be altered to avoid impacting an archaeological site, then a process of evaluation followed by excavation if necessary would be undertaken. The likelihood of this evaluation being required is, however, considered to be minimal and the overall impact on the known and potential archaeological resource is assessed as being of **negligible** significance.

2.12 Radar and Transmission Systems

As the removal of all structures above the mean high water springs will eliminate any potential interference with radar or transmission systems, **no impacts** are anticipated during the decommissioning phase.

2.13 Other Human Activities

2.13.1 Impact on oil and gas operations and ancillary structures

No impacts on oil and gas operations are predicted due to the absence of current interests in the area.

2.13.2 Impact on aggregate extraction

The decommissioning of the Thanet project will not have any direct impact upon the aggregate extraction activities at Kentish Knock and Long Sand due to the significant distance of separation.

2.13.3 Impact on marine disposal sites capital and maintenance dredging activities

No direct impact on the marine disposal sites at Pegwell Bay and South Falls are predicted other than potential indirect impacts associated with vessel movements (see **Section 1.10**).

As the export cables will remain in situ, there is expected to be **no impact** on the approach channel to Port of Ramsgate.

2.13.4 Impact on telecommunications cables

The export cable routes will cross three existing telecommunications cables to the southwest of the Thanet site. Given that the export cables will remain in situ, **no impact** to the existing telecommunications cables is anticipated during the decommissioning phase.

2.13.5 Impacts due to unexploded ordnance

Site safety instructions will be prepared to include necessary actions to be taken in the event that an item of ordnance is located during decommissioning. In addition, munitions awareness briefings will be given to all contractor's site and ship's staff prior to and during the decommissioning phase.

Given that these measures are successfully implemented, a **negligible** impact is predicted.

2.14 Socio-economics

It is anticipated that the decommissioning phase of the Thanet project will require a range of specialist contractors, some of which may be sourced locally, however overall impacts on socio-economics over the six month period are anticipated to be **negligible**.

2.15 Terrestrial Ecology

The onshore cables will remain buried throughout their lifetime and will remain in situ after decommissioning, unless otherwise specified by the Local Planning Authority. Therefore, **no impacts** are anticipated.

2.16 Landscape and Visual Character

Given that the onshore cables will be left in situ, **no impacts** on landscape and visual character would be anticipated. Any decommissioning activities at the Richborough power station site will be short term and within an existing industrial area.

2.17 Terrestrial Archaeology and Cultural Heritage

The onshore cables will be left in situ and notified as disused, unless otherwise agreed with the Local Planning Authorities. Therefore, **no impacts** are envisaged.

2.18 Coastal Tourism and Recreation

The landfall area and buried onshore cables will remain in situ, therefore the impact of the onshore construction works on traffic and access is estimated to be of **negligible** significance (see **Section 1.20**).

2.19 Traffic and Access

As the cables will be disconnected and left in situ, unless otherwise advised by the Local Planning Authority, **no impacts** are anticipated.

2.20 Noise, Dust and Air Quality

It is anticipated that only minor demolition works will be necessary at the substation. Given good site practice, **no impacts** on noise, dust or air quality are anticipated.