East Anglia THREE
Offshore Windfarm

East Anglia THREE

Volume 2. Orford Inshore rMCZ Assessment

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1 Introduction

1.1 Background

1. In November 2015 an application was made by East Anglia THREE Ltd (EATL) for a Development Consent Order (DCO) to build the East Anglia THREE offshore wind farm (East Anglia THREE) a wind farm 69km of the coast of East Anglia. All documents which form the application can be found on the Planning Inspectorate website[1].

2. Following advice provided by the MMO during the Environmental Impact Assessment (EIA) process for East Anglia THREE, recommended Marine Conservation Zones (rMCZ) were acknowledged within the benthic ecology assessment, but were not subject to a formal assessment. As part of the examination of the East Anglia THREE DCO application a request has been made by Natural England (in their relevant representation of 23rd March 2016 and at a meeting with EATL on the 8th June) that further information be provided on the potential impacts of East Anglia THREE on Orford Inshore rMCZ.

1.2 The Project

3. Chapter 5 of the Environmental Statement (ES) (Document reference 6.1.5) of provides a detailed description of East Anglia THREE, which in summary would comprise the following offshore elements:

- Up to 172 offshore wind turbines and associated foundations, with an installed capacity of up to 1,200 MW;
- Up to two meteorological masts and foundations;
- Up to twelve buoys;
- Up to six offshore electrical stations;
- Up to one offshore platform housing accommodation facilities;
- Subsea inter-array cables between the wind turbines and offshore electrical stations;
- Up to four subsea export cables to transmit electricity from the offshore electrical stations to shore;
- Up to four interconnector cables between the East Anglia ONE and East Anglia THREE Projects;
- Scour protection around foundations and on inter-array and export cables as required; and
- Landfall at Bawdsey with onshore transition bays to join the offshore and onshore cables;

[1] https://infrastructure.planninginspectorate.gov.uk/projects/eastern/east-anglia-three-offshore-wind-farm

1.3 Relevant MCZs

4. East Anglia THREE does not overlap with any designated or recommended MCZ sites; however the Orford Inshore rMCZ is located approximately 300m from the East Anglia THREE offshore cable corridor (see Figure 1). All other MCZ or rMCZ sites are located greater than 2km which is considered a sufficient distance from East Anglia THREE to screen out the potential for any impacts upon them.

2 Orford Inshore rMCZ

5. When originally proposed, the Site Assessment Document (SAD) (Net Gain, 2011) for the Orford Inshore rMCZ recommended that the site be designated for the Broad Scale Habitat (BSH) **subtidal mixed sand and gravels**. A number of other features were identified as present due to further survey work completed in 2012 (DEFRA 2015). The features present within the Orford Inshore rMCZ are shown in Table 1 below

Table 1 conservation features within the Orford Inshore rMCZ.

Feature	Proposed / present	Identified
Broadscale Habitats (BSH) A5.4 Subtidal mixed sediments	Proposed for inclusion	In the SAD
BSH A5.1 Subtidal coarse sediment	Present but not proposed for inclusion	In the SAD
BHS A5.2 Subtidal sand	Present but not proposed for inclusion	In the SAD
Habitat FOCI Subtidal Sands and Gravels	Present but not proposed for inclusion	Identified as present during further survey work (DEFRA 2015)

6. Figure 1 shows the location of the Orford Inshore rMCZ in relation to the East Anglia THREE export cable corridor. It should be noted that the boundary of the rMCZ has not been finalised and is therefore is subject to change. Based on the latest available data the Orford Inshore rMCZ is located approximately 300m from the East Anglia THREE export cable corridor at its closest point.

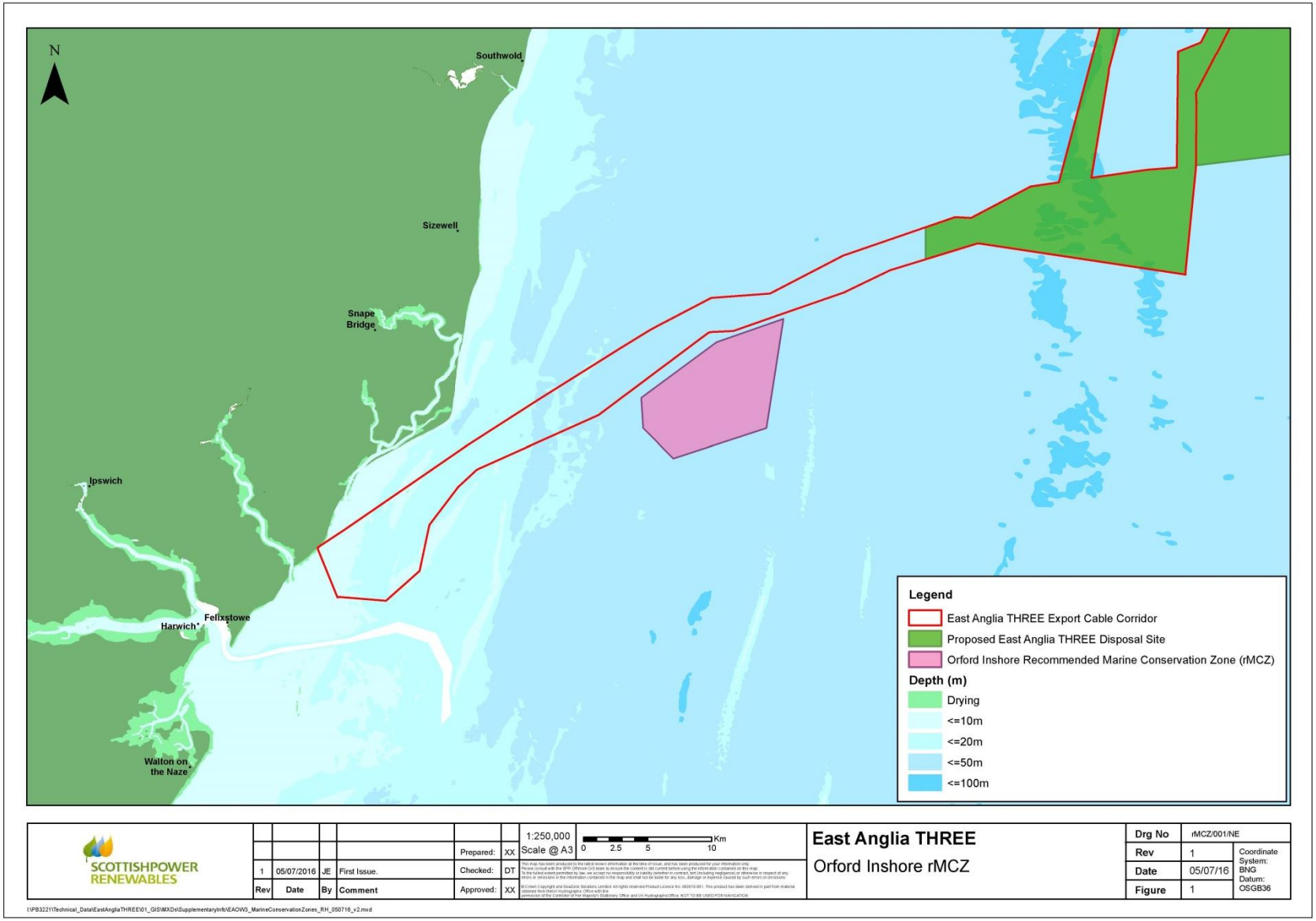

Figure 1. Location of the Orford Inshore rMCZ in relation to the East Anglia THREE export Cable Corridor

3 Impact Assessment

7. Given the proximity of the Orford Inshore rMCZ to the East Anglia THREE export cable corridor there would be potential for East Anglia THREE to impact upon the features proposed for designation (see section 2 above). The impacts assessed for benthic receptors (Chapter 10 Benthic Ecology of the ES, DCO document reference 6.1.10) are listed below and screened for relevance to the Orford Inshore rMCZ.

Table 2. Benthic ecology impacts (adapted from Table 10.20 of the benthic ecology ES Chapter) screened for relevance and assessed for the Orford Inshore rMCZ

Potential Impact	Comments	Assessed (Y/N)
Construction		
Temporary Physical disturbance	No impact as no physical overlap	N
Smothering due to increased suspended sediment	Potential for sediment release during cable installation	Y
Re-mobilisation of contaminated sediments	Potential for sediment release during cable installation	Y
Underwater noise and vibration	No sensitive features in the rMCZ	N
Operation		
Permanent habitat loss	No impact as no physical overlap	N
Physical Disturbance through maintenance activities	No impact as no physical overlap	N
Smothering through increased suspended sediment	Potential for sediment release during cable maintenance	Y
Re-mobilisation of contaminated sediments	Potential for sediment release during cable maintenance	Y
Colonisation of foundations and cable protection	n/a	N
EMF	No sensitive features in the rMCZ	N
Decommissioning		
Temporary Physical disturbance	No impact as no physical overlap	N
Smothering due to increased suspended sediment Benthic Habitats and species	No impact if cables left in situ	N
Re-mobilisation of contaminated sediments	No impact if cables left in situ	N
Underwater noise and vibration	No sensitive features in the rMCZ	N

8. Given the lack of physical overlap, there would be few sources of potential impact on the rMCZ. One potential source would be the release of suspended sediments (including sediment that potentially contains contaminants) during construction, operation or decommissioning. This could affect water quality within the Orford Inshore rMCZ and could fall out of suspension smothering habitats within the site. It should be noted that EATL, are applying, as part of the DCO application for licence to dispose of material within an area that covers the wind farm site and the eastern part of the offshore cable corridor. Therefore if dredging is undertaken the spoil would not be released in the immediate vicinity of the rMCZ but would be deposited over 10km to east of the site. Further detail is provided in the Site Characterisation Report (document reference 8.18 of the East Anglia THREE DCO application).

9. A further source of impact may occur during the operation phase as a result of cable protection measures altering the hydrodynamics and therefore physical processes within the vicinity of the rMCZ. However, as outlined in the section 5.5.14.5 of Chapter 5 Description of the Development of the ES (DCO document reference 6.1.5) the predicted height of cable protection would be less than 1m (see Table 5.26 of Chapter 5) and would therefore only have a very small and localised effect on physical processes. The only exception being where the cable route crosses a subsea pipeline where cable protection could be up to 4m in height. However this crossing is located at a sufficient distance from the rMCZ to rule out any potential effects.

10. Chapter 7 Marine Geology, Oceanography and Physical Processes of the ES (document reference 6.1.7) assesses the impacts of the proposed project on marine geology, oceanography and physical processes and Chapter 8 Marine Water and Sediment Quality (document reference 6.1.8) assesses the impacts of the proposed project on marine water and sediment quality. The following sections area of particular relevance to this assessment of impacts to the rMCZ:

    - 7.6.1.5, Changes in Suspended Sediment Concentrations during Offshore Export Cable Installation (this impact would occur during construction);
    - 7.6.1.6 Changes in Sea bed Levels due to Offshore Export Cable Installation (this impact would occur during construction); and
    - 7.2.2.7 Morphological and sediment transport effects due to cable protection measures for offshore export cables (During operation):
    - 8.6.1.3 Change in Water Quality due to Re-suspension of Sediments during Offshore Export Cable Installation (during construction); and
    - 8.6.1.4 Change in Water Quality due to Re-suspension of Contaminants within Sediment (during construction).

3.1 Changes in Suspended Sediment Concentrations during Offshore Export Cable Installation

11. The potential magnitude of this impact was defined in two parts, firstly an assessment to predict how much seabed levelling would be required for the export cable installation and secondly a qualitative assessment of how much sediment would be bought into suspension due to the cable laying process, whether that be by jetting, ploughing or trenching (the worst case being jetting).

12. This assessment found that the overall sediment release volumes would be low and confined to near the sea bed (rather than higher in the water column) along the alignment of the export cable corridor, and the rate at which the sediment would be released into the water column from the jetting process would be relatively slow. Using modelling simulations undertaken for the East Anglia ONE assessment (ABPmer 2012) it was predicted that the magnitude of the changes in suspended sediment concentrations would be low in the nearfield and negligible in the far field resulting in an impact significance of **no impact**.

3.2 Changes in Sea bed Levels due to Offshore Export Cable Installation

13. Due to the fact that only very small changes in suspended sediment were predicted the changes in seabed levels as a result of export cable installation were also predicted to be small. Modelling completed for East Anglia ONE (ABPmer 2012) indicated that deposits of up to 2mm would be seen within a few hundred meters of inshore sections of the cable, however in deeper water and further afield sea bed level changes would not be measurable. Therefore, it was concluded that the impact would be low in the nearfield and negligible in the far field resulting in an impact significance of **no impact**.

3.3 Morphological and sediment transport effects due to cable protection measures for offshore export cables

14. The assessment concluded that in the sections of the export cable corridor that are located seaward of the closure depth (of which the majority of the export cable corridor that runs adjacent to the Orford Inshore rMCZ is located), any protrusions from the sea bed associated with cable protection measures (up to a maximum of 1m) are unlikely to significantly affect the migration of morphological features. The assessment concluded that there may be localised interruptions to bedload transport in some areas, especially at cable crossings, but the gross patterns of bedload transport would not be affected significantly.

15. Inshore of the closure depth (a small part of the of the export cable corridor that runs adjacent to the Orford Inshore rMCZ is located within this depth) mitigation measures have been embedded in the project to minimise impacts. The measures include a commitment that cable protection is limited to 2.5% of the length of the export cables to the west of cable crossings with the Greater Gabbard and Galloper offshore windfarm export cables.

16. In consideration of the above the assessment found that the magnitude of impacts on morphology and sediment transport would be low and that there would be **no impact** on morphological features.

3.4 Change in Water Quality due to Re-suspension of Sediments during Offshore Export Cable Installation.

17. This assessment concluded that any affects would be localised and short term in nature and therefore, the potential effects of resuspension of sediments would be of negligible magnitude and as a result an impact of **negligible** significance was predicted.

3.5 Change in Water Quality due to Re-suspension of Contaminants within Sediment.

18. Contaminant levels were generally low at all sites sampled for the proposed East Anglia THREE project. Given the low levels, it was predicted that any sediment released into the water column is unlikely to release significant contamination and as a result the magnitude of this impact was considered to be low. One sample (site 30) did show high levels of arsenic; however this site is located at a sufficient distance from the rMCZ to rule out any potential impacts (see Figure 8.1 of the ES). Overall the assessment of resuspension of contaminants concluded an impact of **negligible** significance.

3.6 Assessment Conclusion

19. Impacts assessed within the Chapter 7 and Chapter 8 of the East Anglia THREE ES indicate that there would be no pathway for the East Anglia THREE project to impact upon the proposed features within the Orford Inshore rMCZ, therefore no adverse effect on the site is predicted should it be designated. The third and final tranche of designations are expected in 2018.

4 References

ABP Marine Environmental Research Ltd. (ABPmer) (2012b). *East Anglia Offshore Wind Project ONE Windfarm: Marine geology, oceanography and physical processes environmental baseline*. Report R3945. May 2012.

Department for Environment Food and Rural Affairs (DEFRA) (2015) Orford Inshore rMCZ Post-survey Site Report.

Net Gain (2011). Final Recommendations Submission to Natural England and JNCC, Version 1.1. 880 pp.

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