Hornsea Project Four

Clarification Note: Marine Processes Supplementary Work Update

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Revision Summary

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Revision Change Log

Rev	*Page*	*Section*	*Description*
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Acronyms

Term	Definition
DGM	Digital Ground Model
DGPS	Differential Global Positioning System
EGA	Expert Geomorphological Assessment
ERYC	East Riding of Yorkshire Council
HTA	Historical Trend Analysis
MMO	Marine Management Organisation
SPR	Source-Pathway-Receptor

1 Introduction

1.1.1.1 Further to the Applicant's submission at Deadline 2 (REP2-038) and in response to the comments submitted by Natural England (RR-029) and the Marine Management Organisation (MMO) (RR-020), an independent study has been commissioned by the Applicant and is currently underway. The objective of this study is to provide further information relating to any changes to the physical processes or changes to the hydrodynamic regime and sediment transport regime because of Hornsea Four. This independent study is currently ongoing; however, it's focus is on the main issues raised by Natural England and the MMO, for which the Applicant understands that these relate to three main receptors: specifically, Smithic Bank, Holderness Coast and Flamborough Front.

2 Project Update

2.1.1.1 The independent study has been divided into two main elements – 1. baseline environment; and 2. assessment of effects. These two elements have in turn been divided into specific assessment methods. For Smithic Bank and the Holderness coast, the baseline environment has been described using Historical Trend Analysis (HTA). A data review, drawing on existing models and scientific literature, has been used to describe the baseline environment of Flamborough Front (spatial and temporal extent and variability), as HTA is not applicable. The assessment of effects is driven by Expert Geomorphological Assessment (EGA) which has been used to develop a Source-Pathway-Receptor (S-P-R) model which is a simple visualisation of the receptors that have been considered and the impact pathways. The S-P-R model has combined the outcome of the data review with the receptor locations and extents and in turn the pathways and potential receptors that could be affected by changes in the hydrodynamic and sedimentary environment because of Hornsea Four have been mapped.

2.1.1.2 The HTA method essentially involves the interrogation of time series data to identify directional trends and rates of processes and morphological change over varying time periods. Smithic Bank digital bathymetry data from 1979 (Admiralty), 2011 and 2016 has been assessed in this way. Digital bathymetry data has been collected across most of the bank feature in 2011 by the Channel Coastal Observatory. Bathymetry data was collected by Titan Environmental Surveys and held by East Riding of Yorkshire Council (ERYC) in 2016, who has provided consent for its use in the Applicant's independent study. All bathymetry data available at to date has been reviewed and drawn on for the purposes of the independent study (including the 2021 Project specific bathymetry). Digital Ground Models (DGMs) for each of the survey efforts have been produced to identify features including mobile bedforms and areas of outcropping bedrock. Where bathymetry data overlaps (e.g. 1979, 2011 and 2016 bathymetries), these have been compared to identify and quantify areas of morphological change (erosion and deposition of sea-bed sediment) or areas of seabed that have been static (bedrock) or in equilibrium. Long term changes have been assessed through comparing the 2011 data against that of the 1979 data. Similarly, short-term changes have been assessed through comparing the 2011 data with that obtained in 2016. All bathymetry interpretations are supported by cross sections at key locations.

2.1.1.3 For the Holderness coast, ERYC has monitored the retreat of the Holderness cliffs through regular surveys of the cliff edge since 1951, relative to 123 measuring posts (post 1 is at Sewerby, whilst 123 is at the neck of Spurn Head). In 2003, ERYC initiated a new system of monitoring using the Differential Global Positioning System (DGPS), every six months. Prior to 1951, going back to 1852, ERYC estimated cliff erosion rates using historical Ordnance Survey (OS) map data. This data has been used to inform the conclusions that will be presented in the report presenting the results of the independent study.

2.1.1.4 In relation to the Flamborough Front, the study has drawn on existing technical work carried out by Royal HaskoningDHV, in combination with any new datasets identified by Natural England, MMO and Cefas.

2.1.1.5 The report presenting the outcome of the independent study will be submitted at Deadline 4.