FOREWIND

DOGGER BANK
TEESSIDE A & B

March
2014

Environmental Statement
Chapter 20
Seascape and Visual Character

Application Reference: 6.20

Cover photograph: Installation of turbine foundations in the North Sea

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1. Introduction

1.1. Background

1.1.1. This chapter of the Environmental Statement (ES) describes the existing environment with regard to seascape and visual resources and assesses the potential impacts of Dogger Bank Teesside A and Dogger Bank Teesside B during the construction, operation and decommissioning phases.

1.1.2. The chapter only considers impacts on seascape: the assessment of impacts on landscape and views arising from the onshore grid connection work associated with Dogger Bank Teesside A & B is provided in **Chapter 21 Landscape and Visual Assessment** of this ES. Impacts on historic seascape character concerning perceptions and associations with the sea surface are also considered in this assessment. Potential impacts on the historic seascape character of the water column, seabed and sub-seabed are dealt with in **Chapter 18 Marine and Coastal Archaeology** of this ES.

1.1.3. For further information on legislation and planning policy refer to **Chapter 3 Legislation and Policy**. For tourism and recreation see **Chapter 23 Tourism and Recreation**. For shipping and navigation see **Chapter 16 Shipping and Navigation**, for marine and intertidal ecology see **Chapter 12 Marine and Intertidal Ecology**, and for marine and coastal archaeology refer to **Chapter 18**.

1.2. Definition of seascape and assessment approach

1.2.1. The UK Marine Policy Statement (2011) states that "*there is no legal definition for seascape in the UK but the European Landscape Convention (ELC) defines landscape as an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*" and refers to the use of the term in the Statement as meaning "*landscapes with views of the coast or seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other*" (Paragraph 2.6.5.1).

1.2.2. The Dogger Bank Zone is located beyond the limit of visibility from any coastal area (due to both the earth's curvature and atmospheric conditions). There will be no areas of intervisibility between the marine area in which the wind farms are proposed and the land, albeit that inshore areas, which will be affected by the installation of the export cables, will be intervisible with land.

1.2.3. For the purposes of this assessment, a broad definition of 'seascape' is adopted to reflect the UK Marine Policy Statement. This encompasses consideration of the perceptual, historical and cultural dimensions of the marine environment beyond the visual limits of the coast as follows:

"*An area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors*" (Natural England 2012, page 8).

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1.2.4. This definition extends beyond purely visual interactions between land and sea, to incorporate a consideration of wider historic and cultural dimensions and the character and perceptual qualities of open sea. This is in recognition that the majority of the study area comprises marine areas where there are no such visual interactions. It also reflects the Marine and Coastal Access Act 2009 and the draft UK Marine Policy Statement (2010) which states that references to seascape "*should be taken as meaning landscapes with views of the coast or seas, and coasts and the adjacent marine environment with cultural, historical and archaeological links with each other*..." (Paragraph 2.6.5.1).

1.2.5. The marine environment is, therefore, seen to be an integral part of the experience of seascape. It follows that changes within the visual marine environment, such as the introduction of an offshore wind farm, may result in changes in the perception of seascape.

1.2.6. A separate but related assessment of impacts on Historic Seascape Character has also been undertaken and is limited to a consideration of the sea surface, in order to provide a comprehensive assessment of potential impacts on the historic and cultural dimensions of the marine area.

1.2.7. This chapter sets out an assessment of potential impacts on seascape and views as a consequence of:

- Installation of the landfall and offshore sections of the export cables;
- Construction, operation and decommissioning of Dogger Bank Teesside A & B; and
- Cumulative impacts with other developments, including other projects within the Dogger Bank Zone.

1.2.8. This assessment considers the potential impacts on:

- The coastal landscape and adjoining areas of open water in relation to the installation of the export cables and landfall for Dogger Bank Teesside A & B, including views between land and sea and along the coastline;
- The marine seascape character and potential views and sea-based viewing groups in relation to the construction and operation of the wind farms; and
- Surface (i.e. visible) aspects of historic seascape character, which may arise as a consequence of the above.

1.2.9. Export cables, both offshore and at the landfall, will be buried below the seabed/beach once fully installed. There will no permanent structures or other visible features present at the landfall or on the sea surface that would give rise to impacts on the seascape, views or historic seascape character during their operation. As such, the potential operational effects of the export cable route and landfall are not considered further in the assessment.

1.2.10. Industry standard practice is to leave buried cables *in-situ*, as opposed to removal, during the decommissioning phase. However it is recognised that coastal erosional processes may require that cables are removed in the area around the landfall and the beach. Away from the shore, there will not be any

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significant impacts on seascape, views or surface aspects of historic seascape character arising from decommissioning, and so these are not considered further.

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2. Guidance and Consultation

2.1. Policy

2.1.1. The Seascape and Visual Impact Assessment (SVIA) has been undertaken with specific reference to the relevant National Policy Statements (NPS). These are the principal decision making documents for Nationally Significant Infrastructure Projects (NSIP). These documents set out the assessment requirements for landscape, seascape and visual impact assessment.

2.1.2. The document relevant to Dogger Bank Teesside A & B is NPS for Renewable Energy Infrastructure (EN-3) (Department of Energy and Climate Change (DECC) 2011b).

2.1.3. The assessment requirements and guidance pertaining to SVIA, as they are defined in this document, are summarised in **Table 2.1** together with an indication of the paragraph numbers in the ES chapter where each is addressed. Current legislation and policy relevant to Dogger Bank is described in full in **Chapter 3** of this ES.

Table 2.1 NPS assessment requirements

NPS Requirement	NPS Reference	ES Reference
NPS EN-3 states that: "Where necessary, assessment of the seascape should include an assessment of three principal considerations on the likely effect of offshore wind farms on the coast: • Limit of visual perception from the coast; • Individual characteristics of the coast which affect its capacity to absorb a development; and • How people perceive and interact with the seascape".	Para 2.6.203	**Chapter 21 Landscape and Visual Impact Assessment** and Sections 3, 5, 6 and 7 of this chapter.
The NPS EN-3 requires the "Magnitude of change to both the identified seascape receptors (such as seascape units and designated landscapes) and visual receptors (such as viewpoints) [to] be assessed in accordance with the standard methodology for SVIA".	Para 2.6.205	Section 3

2.1.4. As Dogger Bank Teesside A & B will not be visible from land, the assessment of impacts on visual perception from the coast and on coastal character is limited to a consideration of the potential impacts arising from the installation of the subsea export cables and landfall works. The assessment of impacts on landscape and visual resources landward of Mean High Water (MHW), including the coastal landscape, arising from the onshore components of the projects (the landfall and onshore cable) is provided in a separate Technical Report (**Appendix 21A**) and summarised in **Chapter 21** of this ES.

2.1.5. The assessment also considers the character and wider cultural perception of the marine component of the study area, and the proposed offshore wind farm

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development areas (described in Section 4 of this report), and potential visual interactions experienced by marine-based receptors.

2.2. Other legislation, standards and guidance

2.2.1. The SVIA was undertaken following the approach set out in the Landscape Institute and Institute of Environmental Management and Assessment (2002) Guidelines for Landscape and Visual Impact Assessment, and the Department of Trade and Industry (DTI) Guidance on the Assessment of the Impact of Offshore Wind Farms: Seascape and Visual Impact Report (DTI 2005). It has also drawn on An Approach to Seascape Character Assessment (Natural England, 2012).

2.2.2. Since the work was prepared, the Third Edition of the Guidelines for Landscape and Visual Impact Assessment has been published (April 2013). It is recognised that the principles and approach advocated in this latest version of the guidance do not differ from earlier versions, and that its main purpose is to seek to achieve more consistent use of terms between professionals, and to ensure that the process is as transparent as possible. The Landscape Institute has published a statement clarifying that assessments carried out under earlier versions of guidance retain their validity. The application of the new guidance would make no material difference to the conclusions of the seascape and visual impact assessment presented in this chapter.

2.2.3. Other guidance documents referred to include:

- Natural England (2012) An Approach to Seascape Character Assessment;
- Scottish Natural Heritage (SNH)(2012a) Offshore Renewables – guidance on assessing the impact on coastal landscape and seascape: Guidance for Scoping an Environmental Statement;
- SNH (2012b) Assessing the Cumulative Impact of Onshore Wind Energy Developments;
- SNH and Marine Scotland (2011) Advice Note: Offshore Wind Farm Landscape/Seascape, Visual and Cumulative Assessment: Recommended Outputs;
- SNH and the Countryside Agency (2002) Landscape Character Assessment: Guidance for England and Scotland; and
- Scottish Natural Heritage and the Countryside Agency (2002) Landscape Character Assessment: Guidance for England and Scotland - Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity.

2.2.4. Reference was also made to the following:

- COWRIE, Wessex Archaeology (2007) Historic Environment Guidance for the Offshore Renewable Energy Sector;
- Historic Environment Service Cornwall County Council (2007) England's Historic Seascapes Scarborough to Hartlepool and Adjacent Marine Zone Historic Seascape Assessment. Report for English Heritage; and

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- Scottish Natural Heritage (2004) An assessment of the Sensitivity and Capacity of the Scottish Seascape to in Relation to Offshore Windfarms.

2.3. Consultation

2.3.1. To inform the ES, Forewind has undertaken a thorough pre-application consultation process, which has included the following key stages:

- Scoping Report submitted to the Planning Inspectorate (May 2012);
- Scoping Opinion received from the Planning Inspectorate (June 2012);
- First stage of statutory consultation (in accordance with sections 42 and 47 of the Planning Act 2008) on Preliminary Environmental Information (PEI) 1 (report published May 2012); and
- Second stage of statutory consultation (in accordance with sections 42, 47 and 48 of the Planning Act 2008) on the draft ES designed to allow for comments before final application to the Planning Inspectorate.

2.3.2. In between the statutory consultation periods, Forewind consulted specific groups of stakeholders on a non-statutory basis to ensure that they had an opportunity to inform and influence the development proposals.

2.3.3. Consultation undertaken throughout the pre-application development phase has informed the decisions and the information presented in this document. Between the statutory consultation periods, Forewind consulted specific groups of stakeholders on a non-statutory basis to ensure that they had an opportunity to inform and influence the development proposals. Consultation undertaken throughout the pre-application development phase has informed the decisions and the information presented in this document.

2.3.4. Further information detailing the consultation process is presented in **Chapter 7 Consultation**. A Consultation Report is also provided alongside this ES, as part of the overall planning submission.

2.3.5. A summary of the consultation carried out at key stages throughout the project, of particular relevance to seascape effects, is presented in **Table 2.2**. This table only includes the key items of consultation that have defined the assessment. A considerable number of comments, issues and concerns raised during consultation have been addressed in meetings with consultees and hence have not resulted in changes to the content of the ES. In these cases, the issue in question has not been captured in **Table 2.2**. A full explanation of how the consultation process has shaped the ES, as well as tables of all responses received during the statutory consultation periods, is provided in the Consultation Report.

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Table 2.2 Summary of consultation and issues raised by consultees

Date and consultation type	Consultee	Issue raised	Response
November 2013 (section 42 consultation on the draft ES, statutory)	Natural England	Natural England requested that the use of a 10km study area for the cable route be explained. Natural England noted that the Scottish offshore wind farms are not referred to in the assessment and requested further justification for this.	The basis for the selection of the study area is provided in Section of 3.2 of this report. The nearest offshore wind farm within Scottish waters is the Firth of Forth which is located in excess of 200km. Section 10 of this report sets out the approach taken in selecting projects to include in the cumulative assessment and screening out offshore project located beyond 100km of Dogger Bank Teesside A & B.
April 2013 (PEI 2)	Natural England	Natural England support the proposed approach and methodology to the assessment and welcome the proposed use of the Guidelines for Landscape and Visual Impact Assessment, and the 'Rochdale Envelope' approach with regard to development scenarios. Natural England advise that the potential effects on the coastal landscape in relation to the export cables and landfall should include consideration of the North Yorkshire and Cleveland Heritage Coast designation, as well as the North York Moors National Park.	The assessment considers potential impacts on the North Yorkshire and Cleveland Heritage Coast and the North York Moors National Park, as presented in Section 4 of this chapter.
June 2012 (Scoping)	Planning Inspectorate	Advised that the scope of the Seascape, Landscape and Visual Impact Assessment (SLVIA) should also include the potential impacts as a result of the offshore decommissioning phase.	The assessment considers potential impacts arising during the decommissioning phase, presented in Section 8 of this report.
June 2012 (Scoping)	Joint Nature Conservation Committee (JNCC) and Natural England (joint scoping response)	Concerning landscape/seascape and visual impacts of development, the key issues that require addressing will be: 1. Direct	The assessment considers direct and indirect impacts on the seascape and views, as detailed in

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Date and consultation type	Consultee	Issue raised	Response
		impacts, or physical change, to the landscape and/or seascape (i.e. impacts on the fabric/elements of the landscape/seascape, for example landform changes); 2. Indirect impacts on the character and quality of the landscape/seascape; 3 . Direct impacts on the visual amenity of visual receptors, for example changes in views and their content for stakeholders; 4. Indirect impacts on visual receptors in different places, for example an altered visual perception leading to changes in public attitude, behaviour and how they value or use a place. As area is adjacent to the designated landscape of North Yorkshire & Cleveland Heritage Coast, consideration should be given to the direct and indirect effects upon this designated landscape and in particular the effect upon its purpose for designation.	Sections 6, 7 and 8 of this report.

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3. Methodology

3.1. Introduction

3.1.1. This section sets out the methodology used in the assessment, in accordance with current good practice guidance (see Section 2.2). The methodology is applicable to the assessment of short-term (temporary) effects during the construction of Dogger Bank Teesside A & B, and the long-term effects during operation of the two projects.

3.1.2. The methodology has been developed based on an adaptation of the approach set out in *Guidelines for Landscape and Visual Impact Assessment* (GLVIA) (Landscape Institute and IEMA, 2002), also taking cognisance of the recently published Third Edition of this guidance (2013) and *Guidance on the Assessment of the Impact of Offshore Wind Farms: Seascape and Visual Impact Report* (DTI, 2005). This is considered appropriate as, although the GLVIA is concerned primarily with the assessment of impacts on the terrestrial landscape, the principles and process of assessment are also applicable to the assessment of impacts on seascape. Reference is also made to *An Approach to Seascape Character Assessment* (Natural England 2012) and to the guidance set out in Section 2 of this report.

3.1.3. The approach developed takes account of requirements which are relevant to this project, and guidance and methodologies issued by Forewind.

3.1.4. In this chapter, seascape assessment is distinguished from visual assessment, although the two are closely related. Impacts on views, as perceived by people, are clearly distinguished from effects on seascape and landscape. They are a consequence of changes in the character of the latter. Seascape, landscape and visual assessments are therefore separate, but linked, processes.

3.1.5. Historic Seascape Characterisation (HSC) is distinct from both seascape and visual impact assessment. It extends the principles of Historic Landscape Characterisation (HLC) and is based on a methodology developed by the England's Historic Seascapes Programme. As for HLC, HSC follows a process of creating generalised and descriptive information about the cultural and historic seascape character of an area, or a topic. The aim of HSC is to provide an understanding of the essential characteristics of parts of the historic environment, such as coastal and marine seascapes. However, it should be noted that the understanding and systematic recording of historic seascape information is at a relatively early stage and, as such, there is little relevant guidance available, particularly in relation to the use of HSC data in Environmental Impact Assessment (EIA).

3.1.6. Within this SVIA, an assessment is provided of the potential impacts of the proposed development on the visible components of the historic seascape character, within the development area and Dogger Bank Teesside A & B Export Cable Corridor. As such, it deals only with perceptions and associations

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connected to the sea surface. Potential effects on the historic seascape character of the water column, seabed and sub-seabed are dealt with in **Chapter 18**. This approach was agreed in consultation with Natural England, English Heritage, the project archaeologist and the project landscape architects, and was also used for the SVIA for the Dogger Bank Creyke Beck zones.

Rochdale Envelope

3.1.7. The offshore development, described fully in **Chapter 5 Project Description**, will comprise offshore wind turbines and associated offshore infrastructure, located within the Dogger Bank Zone. The two project boundaries, Dogger Bank Teesside A and Dogger Bank Teesside B, define areas of approximately 560km^2 and 593km^2 respectively.

3.1.8. At this stage, the design of the wind farms, in terms of wind turbine height, numbers, and layout, has not been finalised. The application is, therefore, being progressed using a 'Rochdale Envelope' approach, as described in **Chapter 4 EIA Process**. Full details of the range of development options being considered by Forewind are provided within **Chapter 5**. The realistic worst case scenarios on which the SVIA is based are defined in Section 5 of this chapter.

3.2. Study area

3.2.1. The study area for the SVIA has been established based on the boundaries of Dogger Bank Teesside A & B within Tranche A and Tranche B and the Dogger Bank Teesside A & B Export Cable Corridor. Buffers have been applied to the boundaries to capture potential visual receptors and areas from which the development may theoretically be visible. It comprises the following:

- Landfall and inshore areas: 2km landward of the MHW to 12nm (22.2km) offshore, comprising a 10km wide corridor centred on the export cable route;
- Offshore cable corridor: incorporating a 10km wide buffer centred on the export cable route, extending from 12nm (22.2km) offshore from the landfall (the outer limit of the landfall and inshore study area) to the Dogger Bank development area; and
- Wind farm development areas: comprising the boundaries of Dogger Bank Teesside A & B and a 50km buffer.

3.2.2. There is no potential visibility of the wind turbines from any terrestrial areas, with the Dogger Bank Zone being located in excess of 120km offshore. The study area for the landfall and inshore areas, therefore, reflects the scale and extent of potential visibility of the temporary landfall and offshore cable installation works from land-based and inshore marine-based receptors. Long, elevated views over the coast and sea are available from both the Eston Hills and from the more rugged coastal hills to the southeast, including Warsett Hill. Parts of the area inland of the landfall to the north of the Eston Hills, have more limited visibility of the sea and coast due to the flat topography and development at Redcar and Marske-by-the-Sea. However, to reflect the relatively limited extent of coastal views from land-based visual receptors in the

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low lying flatter areas in the vicinity of the landfall, the study area extends to 2km inland from MHW.

3.2.3. The offshore Dogger Bank Teesside A & B Export Cable Corridor study area reflects the relatively localised extent of potential significant impacts of the temporary installation works. Beyond this area the activities related to the installation works are not likely to give rise to significant effects, as features of this scale seen at this distance will appear small and indistinct.

3.2.4. Due to the curvature of the earth and climatic conditions, wind turbines of the maximum height proposed (315m) will not be visible beyond approximately 75km[1]. Current guidance (DTI 2005) indicates that a 35km radius study area is appropriate, however, this is based on offshore wind energy development proposals at the time of publication, and the scale of wind turbines proposed for Dogger Bank is assumed to be larger. Taking a precautionary approach, a radius of 50km from the development site boundaries of Dogger Bank Teesside A & B has been identified in consultation with Natural England. This reflects the scale of the 'maximum height' scenario, where 10+MW wind turbines to a maximum of 315m above Highest Astronomical Tide (HAT) are installed, and the extent to which these will be visible.

3.2.5. The study area is shown in **Figure 3.1**.

[1] Calculation based on *An assessment of the sensitivity and capacity of the Scottish seascape in relation to windfarms* (SNH, 2005). Appendix B, page 158, provides a formula for calculating the visual range of turbines assuming a viewer height of 1.5m. Using this and assuming the maximum turbine height to tip is 315m this gives the visual range as approximately 130km, although this does not take into consideration the limiting factor of climatic conditions.

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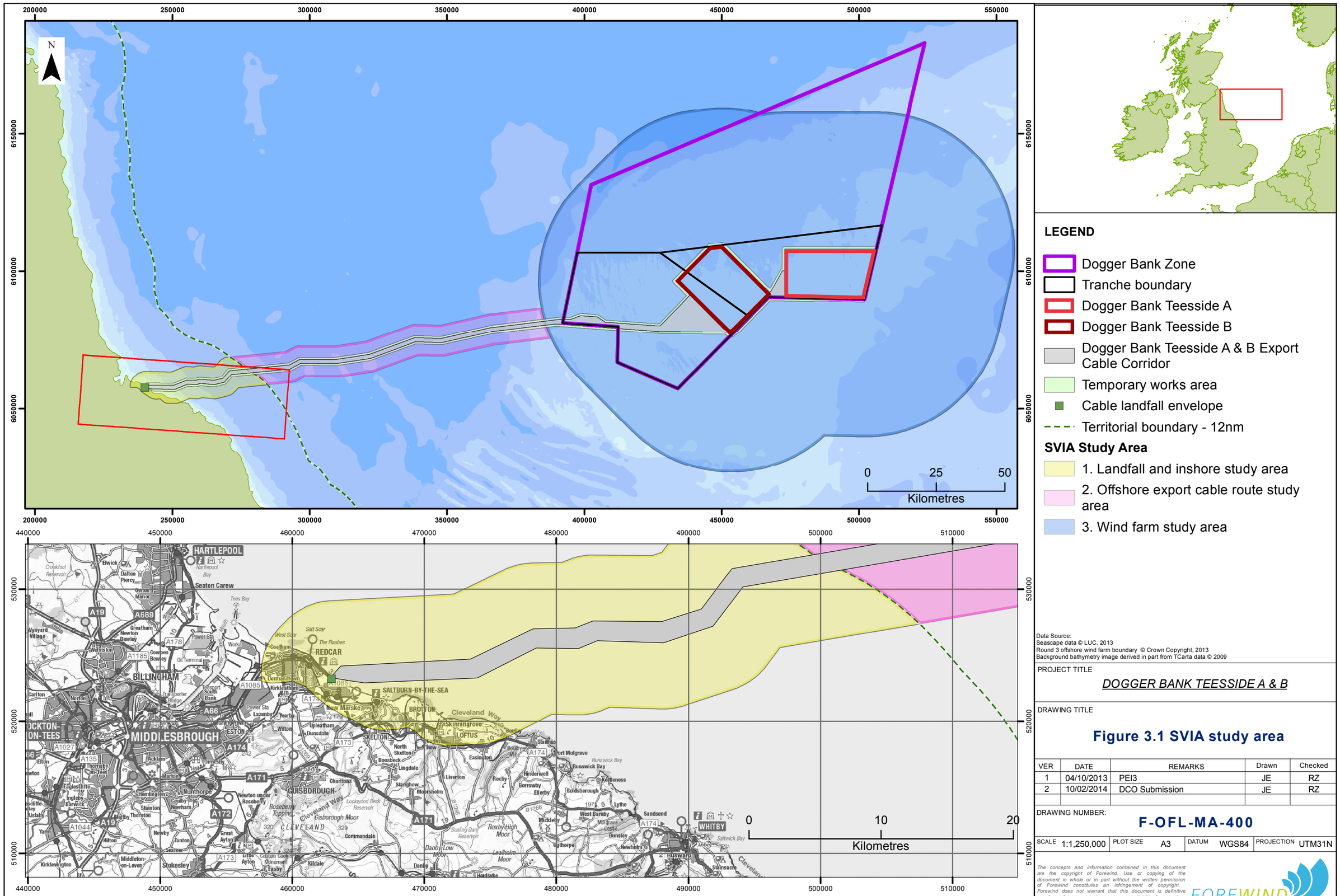

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Cable landfall envelope
- Territorial boundary - 12nm

SVIA Study Area

- 1. Landfall and inshore study area
- 2. Offshore export cable route study area
- 3. Wind farm study area

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 3.1 SVIA study area

VER	DATE	REMARKS	Drawn	Checked
1	04/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-400

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,250,000	A3	WGS84	UTM31N

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3.3. Recording and evaluation of the existing environment

3.3.1. The Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute with the Institute for Environmental Management and Assessment 2002) advise that, in order to reach an understanding of the effects of development, it is necessary to consider different aspects of the landscape/seascape i.e. the individual elements or features that make up the landscape/seascape, as well as its wider character, and the characteristics that contribute to this.

3.3.2. The baseline considered in the SVIA includes information about:

- The seascape and landscape character of the coastal and inshore waters within the study area;
- The seascape character of the marine part of the study area;
- Existing views and visual amenity;
- The sensitivity of the seascape character and visual receptors; and
- Surface (visible) aspects of historic seascape character.

3.4. Data sources

3.4.1. Datasets consulted included GIS data defining seascape and onshore landscape character areas, national landscape designations, HSC data, survey data for commercial shipping, offshore oil and gas installations, and data relating to cruising routes, sailing and racing areas by the Royal Yachting Association (RYA). Data on atmospheric visibility were obtained from the Meteorological Office, to give an indication of the distances from which the offshore development may be visible. Other sources included Ordnance Survey (OS) mapping, Admiralty Charts and aerial photography of the study area, as available online (e.g. Google Maps).

3.4.2. *The Seascape Characterisation Around the English Coast* (Marine Plan Areas 3 and 4 and Part of Area 6 Pilot Study (Natural England 2012a and b)) was used insofar as it covers the study area (the Dogger Bank Development Zone only). The export cable route, landfall and inshore waters fall outside Marine Plan Areas 3 and 4 and are therefore not covered by the pilot study.

3.4.3. The baseline characterisation of seascape was based on high level information relating to coastal morphology and topography and underlying geology, presented in *Dogger Bank Zonal Characterisation Interim Report* (Forewind 2010), *Teesside Offshore Cable Corridor: Technical Report on Landfall Options* (Forewind, 2012, presented in **Appendix 6D**) as well as the *Shoreline Management Plan* - Seaham Harbour to Saltburn (Babtie 1999).

3.4.4. The characterisation of the inshore and landfall study area includes reference to the relevant national and local landscape character assessments, the *Countryside Character of England Volume 1: North East, Character Area 23 Tees Lowland and Character Area 25 North Yorkshire Moors and Cleveland Hills Landscape* (Carl Bro and Golder Associates 2005).

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3.4.5. The following data sources were used:

- Admiralty charted raster, General, 1:150 000;
- Aerial photography;
- Historic Seascape Characterisation Programme - Scarborough to Hartlepool and adjacent marine zones - GIS shapefiles (English Heritage 2011);
- Hydrospatial chartered vector features;
- Met Office visibility frequency analysis data;
- Natural England's national landscape character area data;
- Natural England Heritage Coast designation map data;
- Ordnance Survey maps at 1:50,000 and 1:25,000; and
- UK Coastal Atlas of Recreational Boating 2009 and GIS shapes files 2010 (RYA 2010).

3.4.6. The data and information for the baseline historic seascape characterisation for the study area used GIS data produced as part of the English Heritage Historic Seascape Characterisation programme, insofar as this covers the study area.

Baseline seascape characterisation

3.4.7. The baseline study is based in part on *The Seascape Characterisation around the English Coast (Marine Plan Areas 3 and 4 and Part of Area 6) Pilot Study* (Natural England 2012). The study only covers part of the marine study area (as indicated on **Figure 3.1**). This information was therefore supplemented by desk-studies undertaken in order to characterise the coastline and marine areas outside the pilot study area, based on analysis of coastal morphology and topography, underlying geology, and levels of human influence using the mapping and data sources and studies listed in the section above.

3.4.8. As part of the baseline study, criteria were developed to help inform an understanding of character, against which judgements on the sensitivity of the seascape units could be based. The criteria are broadly based on those used in *An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Offshore Windfarms* (SNH 2004) and includes consideration of:

- Scale and openness;
- Form;
- Modifications/remoteness/sense of naturalness;
- Pattern and foci;
- Lighting;
- Movement;
- Coastal aspect;
- How seascape is experienced; and
- Condition.

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3.4.9. These criteria are used to record and analyse the attributes and qualities of each unit as well as being indicators of relative sensitivity to the proposed development.

Baseline historic seascape character

3.4.10. The baseline study is based on England's Historic Seascapes Scarborough to Hartlepool and Adjacent Marine Zone Historic Seascape Assessment report for English Heritage (English Heritage 2007) and HSC GIS data produced as part of the program. The HSC identifies 'broad character' categories, with nested character types providing additional detail, each with a number of attendant sub-types, as illustrated in **Figure 3.2**. (Taylor *et al.* 2011). Given the very large areas involved and the high-level nature of the HSC process, use of the 'type' level of characterisation is considered to be a proportionate approach.

3.4.11. As previously noted, there is currently little relevant guidance available in relation to the use of HSC data (referenced in the paragraph above) within EIA. While HSC GIS datasets are available for English territorial waters, detailed reports, which provide context and detailed descriptions for the data, are not currently publically available for the area covering the inshore waters and the landfall. It should be noted that the characterisation typology, as illustrated below, actually reflects 'use' rather than 'character' in the traditional sense of the word.

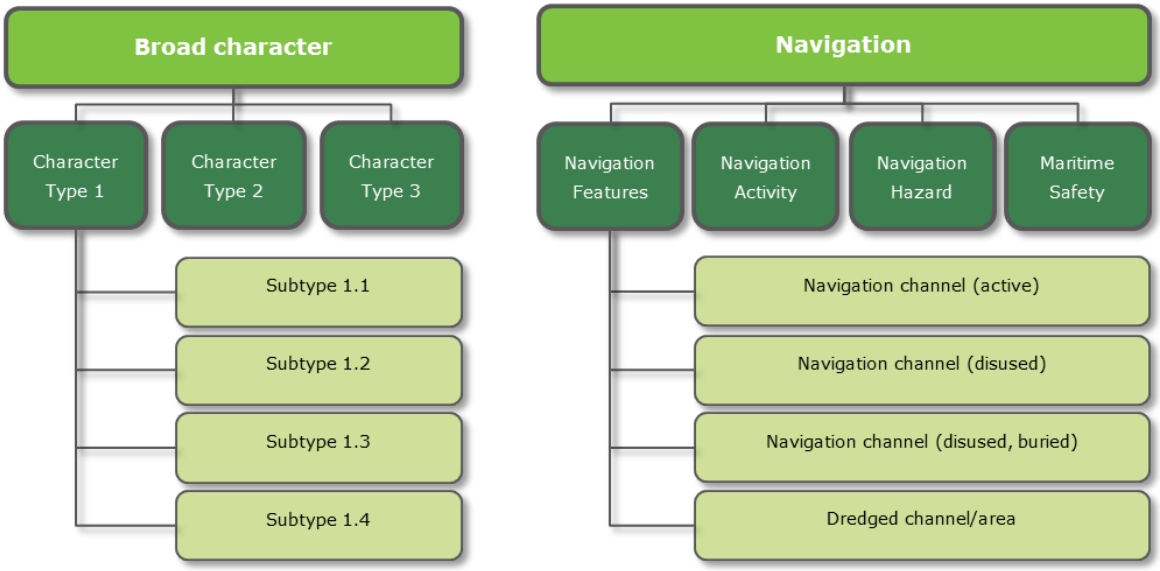

Figure 3.2 HSC typological hierarchy, with example.

Visual amenity

3.4.12. Within the landfall and inshore waters study area, potential visual receptors were identified using OS mapping, the RYA GIS shapefiles showing cruising routes, sailing and racing areas and through field survey.

3.4.13. Within the study areas for Dogger Bank Teesside A & B and the Dogger Bank Teesside A & B Export Cable Corridor, sensitive visual receptors considered in the assessment are limited to those at sea, including potential recreational users.

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3.4.14. The identification of the location of sea-based receptors was informed by data collected relating to recreational vessel movements, recorded through surveys undertaken by Anatec in 2011. Recreational craft routes are divided into Heavy, Medium and Light use based on the RYA classification, as described in **Chapter 16** of this ES.

Visibility

3.4.15. The Met Office records atmospheric visibility on a regular basis. The study area is within the Dogger Shipping Forecast area.

3.4.16. Data were obtained from the Meteorological Office for the Dogger area, giving average visibility over a 30 year period from January 1982 to December 2011. This data is presented in **Table 3.1**.

Table 3.1 Average visibility over a 30 year period from January 1982 to December 2011 for the Dogger area

Extent of visibility (km)	Percentage average visibility (annual) %
0-1km	2.52
1-10km	16.81
10-20km	27.08
20-50km	50.54
50 or more	3.50

3.4.17. It is recognised that true visibility is very variable both across different areas and at different heights above sea level, and so in using this data, it can only be taken to be indicative. It is also recognised that other variables such as daylight affect visibility.

3.4.18. Using this data, the following observations can be made:

- There is no visibility beyond 20km for approximately 46% of the time. The final two rows in **Table 3.1** indicate that there is visibility for 54% of the time beyond 20km, which suggests that there must therefore be no visibility for 46% of the time. This implies that the wind turbines would not be visible beyond 20km of the outer edges of Dogger Bank Teesside A and Dogger Bank Teesside B for approximately 167 days per year; and
- Visibility beyond 50km is relatively limited to approximately 12 days per year.

3.4.19. While this information provides background data, it is acknowledged that it is likely that more viewers, particularly recreational users, will be active when conditions are better, and visibility better. Therefore, all assessment work assumes good visibility, and these conditions are considered in the assessment of effects.

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Wireline visualisations

3.4.20. Wireline visualisations were generated to illustrate potential views of the offshore development from a selection of indicative viewpoints[2] representing the worst case operational scenarios. As described in Section 5, these are based on two parameters:

- Maximum density of the wind turbine array; and
- Maximum visibility, i.e. the maximum height of the wind turbines.

3.4.21. The software package ReSoft 'WindFarm' has been used to prepare a 3D model and view the proposed wind turbines from the selected viewpoints in wireline format. Wind turbine locations, type and size, and viewpoint location coordinates were entered. The WindFarm software includes a default viewer height of 2m above sea level. It is recognised that sea level varies with tides and that receptors will be above sea level when in boats, but, when considered in relation to the height of the turbines proposed, this will not be a perceptible variation.

3.5. Assessment of impacts – methodology

3.5.1. The assessment of seascape and visual effects is typically based on three stages:

- Evaluation of the sensitivity of the seascape and visual receptors;
- Prediction of the magnitude of change in the seascape or the view; and
- Evaluation of the level of seascape and visual effects.

3.5.2. Impacts are assessed with reference to the worst case scenario for seascape and views in accordance with the Rochdale Envelope approach to EIA. The worst case scenario for seascape for Dogger Bank Teesside A & B is defined in Section 5 of this chapter.

3.5.3. As Dogger Bank Teesside A and Dogger Bank Teesside B are collectively the subject of one ES, the impact assessment considers them collectively. However where relevant, a distinction is made between impacts from each of the two projects and the impact of both projects combined.

Sensitivity

3.5.4. The sensitivity of a seascape is dependent upon the location and characteristics of the area, its proximity to, and intervisibility with, the offshore development. It may also depend on any specific values or qualities represented by designations. It is relevant to consider how widespread the type of seascape that will be affected is, and the degree to which the change would affect a unique or valued resource. Sensitivity also takes account of the nature, quality and condition of the seascape and coastal area, and its ability to accommodate change of the type envisaged, without adverse effects on its character.

[2] A wireline (or wireframe) model is a visual presentation of a three dimensional or physical object in 3D computer graphics. It is created using lines to reveal the structure of a 3D model.

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Seascape resources, character and sensitivity

3.5.5. An evaluation of the sensitivity of the seascape units to the proposed offshore wind farms and associated infrastructure in accordance with the approach set out in Topic Paper 6 *Techniques and Criteria for Judging Capacity and Sensitivity* (Natural England 2002) and *Guidance on the Assessment of the Impact of Offshore Wind Farms: Seascape and Visual Impact Report* (DTI 2005). The principles that apply are similar to those used in judging landscape sensitivity, i.e. based on the extent to which a landscape/seascape can accept change of the type and scale proposed, without adverse effects on character.

3.5.6. The assessment of sensitivity considers the ability of each seascape area to accept change of the type proposed (i.e. offshore wind farm development), without detriment to key characteristics (also referred to as susceptibility to change). As such, it is a judgement of sensitivity to a specific type of change, rather than overall or inherent sensitivity.

3.5.7. Judgement on the sensitivity of the seascape within the study area was, therefore, based on the characterisation of the seascape units provided in the baseline study. Criteria were developed to inform this judgement, as a means of recording and analysing specific attributes and qualities of each unit that may indicate relative sensitivity to the proposed development. The criteria developed were broadly based on those used in *An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore wind farms* (SNH 2004) and *A Pilot Seascape Character Assessment for Wales* (CCW 2012).

3.5.8. Based on an evaluation of the indicators of sensitivity, a judgement was then made of the overall sensitivity of the seascape units. For the purpose of this project, sensitivity is classed as high, medium or low, as defined in **Table 3.2**. Not all aspects noted in each row of the table are required to apply concurrently to result in a particular sensitivity being assigned.

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Table 3.2 Indicators of seascape character sensitivity

	Higher	Lower
Criteria	Attributes that make up the character of a seascape offer very limited opportunities for the accommodation of change. Key characteristics of this seascape have limited resilience to change of the type proposed and would be adversely affected by this type of development. A high sensitivity may reflect a seascape of particularly distinctive character, which may be nationally designated for its scenic quality.	A seascape which is of low scenic quality or where its key characteristics and attributes are such that they are resilient to change of the type proposed.
Scale and openness	Areas of small scale, that are enclosed, and where views to horizon are limited by landform. Areas where the introduction of an element of scale could affect previously un-scaled spatial qualities. Areas where openness is a key characteristic and introduction of built elements would compromise this.	Large scale, open views
Form	Intricate coastal edge, with complex, rugged forms.	Flat, horizontal and very simple forms.
Modifications remoteness sense of naturalness	Undeveloped seascape, predominantly natural, apparently unmanaged with a strong sense of remoteness or isolation.	A developed seascape which is heavily modified and managed with a very limited sense of remoteness.
Pattern and foci	An area of complex coastal edges and geological features or with a particularly unified pattern. The presence of important focal points, e.g. headlands, offshore islands, lighthouses.	Simple pattern, with a lack of landmarks or focal points.
Lighting	An area unlit at night, with little impact of lights from sea and land traffic. Lighting sources are limited to scattered small settlements, lighthouses etc.	Area is already well lit at night. There is a strong presence of lights of sea and land traffic or from large coastal settlements.
Movement	Areas where stillness is a key feature. Where/when movement is highly natural, irregular or dramatic (on exposed coastlines, waves crashing) and movement of man-made elements and structures, such as the regular mechanical movement of wind turbines, would distract and detract from this.	Areas with busier qualities, where wind turbine movement relates to other forms of mechanical movement e.g. areas with dense shipping and vessel movements or busy roads close to the coastal edge.
Coastal aspect	Coastal areas where views are aligned towards the open sea and the location of potential development or construction activities. The development and construction activities would interfere with sunrises and particularly sunsets	Coastal views, where available, are aligned away from the location of potential development.
How experienced	The seascape is experienced from a secluded coastline, intimate coastal roads and footpaths.	The seascape is experienced from developed coastal areas or large coastal, busy roads where the focus is on particular activities, rather than on the seascape or views towards the sea.

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Visual sensitivity

3.5.9. The sensitivity of a viewer (or visual receptor) depends on their viewing opportunities and the activities in which they are engaged. Hence, a person partaking in recreation of a type where the view contributes towards enjoyment, such as sailing, is considered to be of higher sensitivity than workers on ships with a transitory view of the proposed development, or travellers with only a passing interest in the seascape environment. The number of people who may be affected is also relevant and this must be considered in the context of the numbers of people in the wider area and their frequency of viewing opportunity, for example, how often and how many people may be present at a particular location. The sensitivity of a viewer also varies with the type and nature of the existing view, and the extent to which it may be affected by the offshore development.

3.5.10. Visual sensitivity is assigned according to **Table 3.3**. Not all aspects noted in each row of the table are required to apply concurrently to result in a particular sensitivity being assigned.

Table 3.3 Indicators of visual sensitivity

Sensitivity	Explanation	Indicators of sensitivity
High	Viewers whose attention or interest is focussed on the seascape, such as receptors on passenger ferries, recreational visitors to the coast or residents occupying properties (may include visitor locations within coastal areas or scenic routes within coastal areas which are nationally designated).	Public views experienced by large numbers of people over relatively long periods (e.g. visitors to popular viewpoints specifically to view the seascape), or public views experienced over long time periods (e.g. as seen by residential receptors). Views may be recognised through national designation, appearance in national guidebooks/ tourist maps, or references to the view in popular literature and art. May be an advertised viewpoint from which there is a view with high scenic quality. There are likely to be few overt or intrusive manmade elements in the view.
Medium	Viewers with a moderate interest in their environment, such as using footpaths or roads at the coastal edge, or recreational sea-based receptors where the main focus of their activity is not directly on the appreciation of the seascape.	Likely to be views experienced by fewer people over relatively long duration, or large numbers of people over shorter time period (e.g. infrequently used cruising routes or locations visited occasionally for diving). Views from the coast may be recognised through local designation, or appearance in local guidebooks/ tourist maps, or referenced in local literature and art. A view with some scenic quality (this may include views across, or within, a locally designated coastal landscape). There may be some overt or intrusive man made elements in the views.

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Sensitivity	Explanation	Indicators of sensitivity
Low	Viewers with a passing interest in their surroundings and whose interest is not specifically focussed on the appreciation of the seascape e.g. receptors on fishing vessels and commercial shipping.	May be a view experienced by relatively few people over a short period of time. Unlikely to be recognised through designation. Likely to be a view with low scenic quality. There may be a number of overt or intrusive human elements already in the view.

Historic seascape character

3.5.11. Sensitivity in relation to HSC is defined on a five point scale (negligible, low, medium, high, very high), in common with the SVIA. Sensitivity is considered in relation to the type of development proposed.

3.5.12. The sensitivity ratings provided in relation to the landfall and inshore waters and the cable route area relate to construction activities only, as the presence of sub-sea export cables will have no residual effect on the perception of surface historic seascape character. For the development area, sensitivities in relation to both construction and operational phases are provided.

3.5.13. It should be noted that assessment of sensitivity relates to the HSC sub-types as receptors, rather than associated users (e.g. the sensitivity of leisure *sailing* as an aspect of historic seascape character, as opposed to recreational *sailors* as a receptor of effects).

3.5.14. The criteria are set out in **Table 4.9** and **Table 4.10**.

Magnitude of change

3.5.15. In the SVIA, magnitude of change is defined in terms of the *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute 2002), and may be slightly different to the magnitude of effect defined for other topics. The magnitude of change in a landscape/seascape or view depends on the nature and scale of the development, and its duration.

3.5.16. In the case of seascape effects, other factors relevant to magnitude include the extent of change in important seascape characteristics, the degree of fit or contrast between any new features and those existing, and the effect on the character and setting of neighbouring areas.

3.5.17. The magnitude of change to a view depends on the proportion of the view that is affected and the prominence of the new features, taking into account distance and contrasts in form, colour, scale and movement. It also depends on the nature and content of the existing view, and the extent of the view, i.e. glimpsed, framed, panoramic etc.

3.5.18. Magnitude of change is described as high, medium, low or negligible (imperceptible change) and these definitions are illustrated by the examples in **Table 3.4**.

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Table 3.4 Magnitude of seascape and visual change

Magnitude	Seascape	Visual
High	Extensive or widespread, long-term or irreversible alteration of seascape resources by large-scale new elements. An obvious (and possibly irreversible) change in seascape character, or to a coastal area, which may alter the key characteristics critical to its distinctiveness.	The proposed development has a defining influence on the view and becomes a key focus in the view. It may not integrate with existing features. It may be a long term (more than fifteen years) and irreversible change.
Medium	Partial change to seascape resources. Discernible (but possibly reversible) and not obvious alteration to seascape character, or to a coastal area, which contributes to its distinctiveness.	The proposed development is clearly visible in the view and forms an important but not defining element of the view. The feature may integrate partially with existing features. It may be a medium term and partially reversible change.
Low	Small, localised, or reversible change to seascape resources. A small (but possibly reversible) change in seascape character, or to a coastal area.	The proposed development is visible, but forms a small element in the view. It integrates to a large degree with existing features. It may be a short term and reversible change.
Negligible	Negligible, fully reversible or no change to seascape resources. A virtually imperceptible (and potentially reversible) change in seascape character, or to a coastal area.	The proposed development may go unnoticed as a small element in the view, or is not visible. It may be very short term and fully reversible change.

3.5.19. Magnitude of change is also set out on a four point scale (negligible, low, medium and high) in relation to historic seascape character (**Table 3.5**). Historic seascape character is principally the product of perception and association. This report provides an assessment of effects on HSC sub-types as a whole, and discusses local effects in more detail.

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Table 3.5 Magnitude of change to historic seascape character

Magnitude of change	Example
High	Substantial change within all or most of a defined area of an HSC sub-type, such that the perception of the historic seascape character is fundamentally changed.
Medium	Substantial change within a large part of a defined area of an HSC type, such that the perception of the historic seascape character is changed. Insubstantial change within all or most of a defined area of an HSC sub-type, such that the perception of the historic seascape character is changed.
Low	Substantial change within a small part of a defined area of HSC sub-type, such that the perception of the historic seascape character could be changed. Insubstantial change within a large part of a defined area of an HSC sub-type, such that the perception of the historic seascape character could be changed.
Negligible	Insubstantial change within a small part of a defined area of HSC sub-type, such that the perception of the historic seascape character is unlikely to be changed.

Significance of impact

Levels of seascape and visual impacts

3.5.20. The degree of impact depends on both the magnitude of change and the sensitivity of the resource or receptor. A higher level of impact is generally attached to large-scale changes affecting sensitive or high value resources or receptors.

3.5.21. The level of significance of impacts is graded from 'Major beneficial' to 'Major adverse' using the following categories:

- Major;
- Moderate;
- Minor; and
- Negligible.

3.5.22. Levels of impact can be understood as being on a continuous spectrum, with a gradual transition between each level – refer to **Figure 3.3**. Professional judgement and experience are applied on a case by case basis in order to identify levels of impact for each resource/receptor. In general, a high magnitude of change affecting a high sensitivity receptor over a long term could result in a major impact while a minor impact will usually result from a long-term small magnitude of change affecting a low sensitivity receptor, or a larger change for a short duration affecting a low sensitivity receptor. Moderate impacts are likely to result when a medium magnitude of change affects a medium sensitivity receptor, or a combination of larger change affect lower sensitivity receptors, or smaller changes affect high sensitivity receptors over a long term. Moderate impacts may also result from larger changes of short duration. If any magnitude of change is recorded as imperceptible, the impact is negligible, whatever the sensitivity of the receptor.

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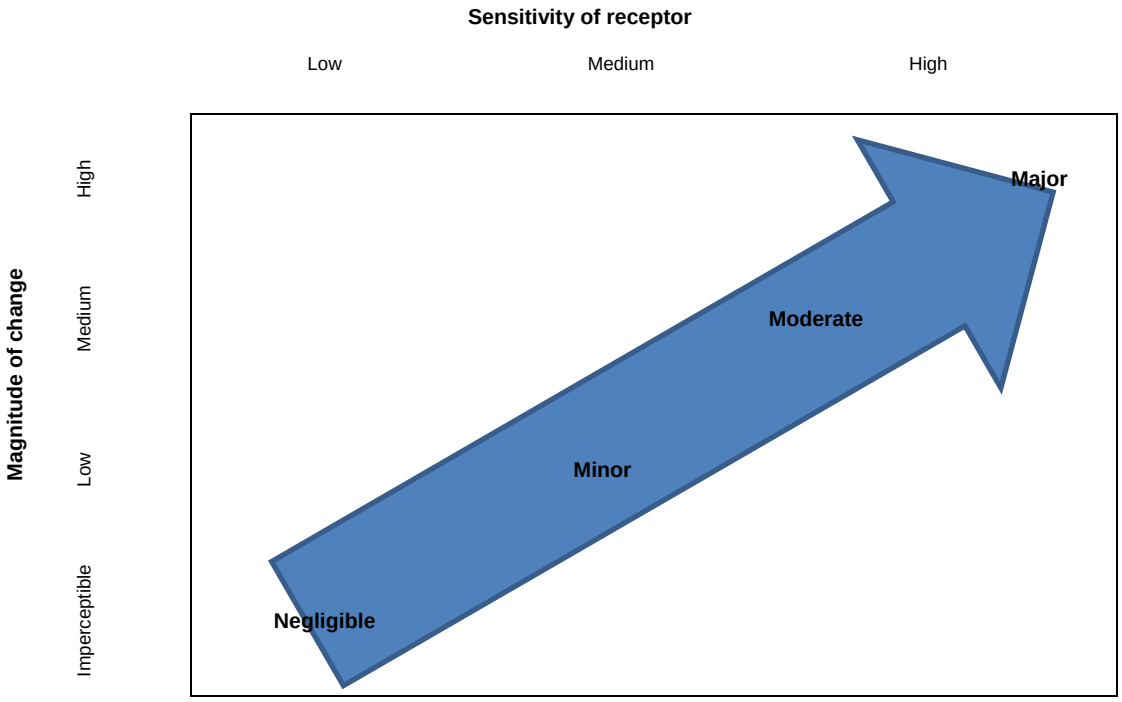

Figure 3.3 Levels of impact

3.5.23. For the purpose of this report, major and moderate levels of impact are considered significant in terms of the Infrastructure Planning EIA Regulations.

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4. Existing Environment

4.1. Introduction

4.1.1. This section sets out the existing conditions across the study areas, and describes the baseline against which the assessment of changes in seascape and views is undertaken. This section provides information about:

- The seascape character of the coast and inshore waters within the study area;
- The seascape character of the marine part of the study area;
- Existing views and visual amenity;
- The sensitivity of the seascape character and visual receptors; and
- The historic seascape.

4.2. Seascape baseline

Designations

4.2.1. The North Yorkshire Moors National Park lies approximately 11km to the southeast of the landfall development and 4km from the export cable route at its nearest point. The nature of the intervening topography is such that there is no potential visibility of the offshore wind farm development or landfall from within the National Park. Potential impacts upon the National Park, arising from the temporary work associated with the installation of the export cable route, are also not considered likely to be significant, due to the distance of the export cable route from the edge. Therefore it is not considered further.

4.2.2. The North Yorkshire and Cleveland Heritage Coast is located approximately 5km to the south of the landfall. Heritage Coasts are not statutory designations, although the North Yorkshire and Cleveland Heritage Coast falls in large part within the North York Moors National Park. The national purposes of Heritage Coasts are to:

- "Conserve, protect and enhance the natural beauty of the coasts, their marine flora and fauna, and their heritage features;
- Facilitate and enhance their enjoyment, understanding and appreciation by the public;
- Maintain and improve the health of inshore waters affecting Heritage Coasts and their beaches through appropriate environmental management measures; and
- Take account of the needs of agriculture, forestry and fishing, and of the economic and social needs of the small communities on these coasts."

4.2.3. Of these, that which is of most relevance to this assessment and which may be affected by change to seascape character and visual amenity as a result of the

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construction works along the export cable route, is the conservation of “natural beauty”.

4.2.4. The location of the North Yorkshire Moors National Park and the North Yorkshire and Cleveland Heritage Coast in relation to the Dogger Bank Teesside A & B landfall and export cable route study area is shown on **Figure 4.1**.

4.2.5. The visibility of the landfall will be limited to the more elevated Warsett Hill at the north-western extent of the Heritage Coast. It will not be visible from the lower lying area of Saltburn at the boundary, due to the profile of the shoreline to the north west and screening by Marske-by-the-Sea. The export cable route intersects with the north western extent of the seaward part of the heritage coast.

4.2.6. There are no other national statutory landscape designations or local landscape designations in the vicinity of the study area.

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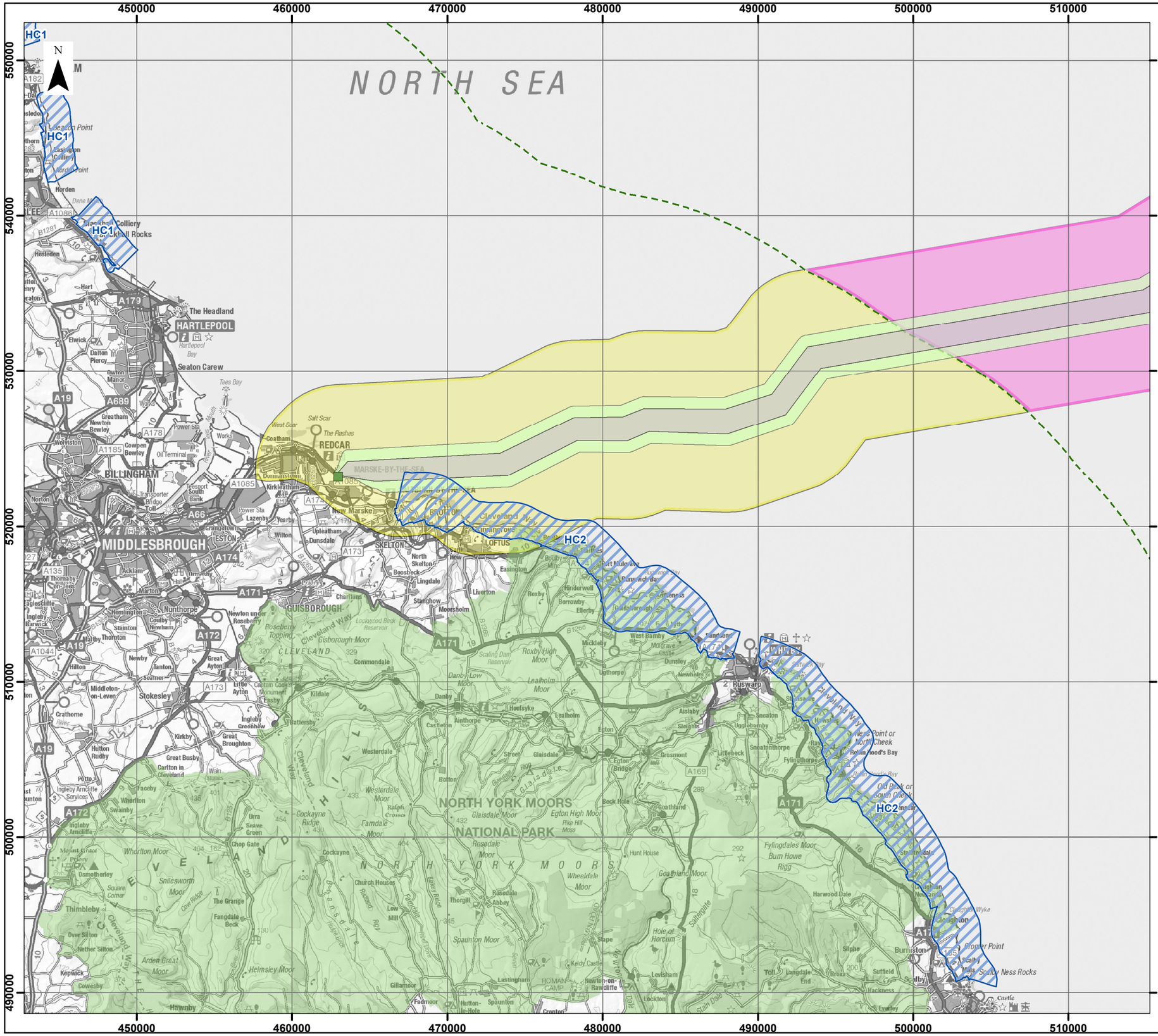

LEGEND

- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Cable landfall envelope
- Heritage Coast
  - HC1. Durham
  - HC2. North Yorkshire & Cleveland
- North York Moors National Park
- 12nm territorial boundary

SVIA Study Areas

1. Landfall and inshore study area
2. Offshore export cable route study area

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.1 Landscape designations: National Parks and Heritage Coasts

VER	DATE	REMARKS	Drawn	Checked
1	10/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-401

SCALE	1:250,000	PLOT SIZE	A3	DATUM	OSGB36	PROJECTION	BNG

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Strategic landscape and seascape character assessment

4.2.7. The Marine and Coastal Access Act 2009 divides the UK marine areas into marine planning regions with an associated plan authority who prepares a marine plan for the area. In the English marine area, the planning authority is the Marine Management Organisation (MMO) and the inshore and offshore waters have been split into 11 plan areas, for which the MMO is in the process of developing marine plans. At present, a Seascape Character Assessment has been undertaken at a strategic scale for the East Marine Plan area, stretching from Flamborough Head to Felixstowe (Natural England, 2012a) only. The location of this in relation to the study area for Dogger Bank Teesside A & B is shown on **Figure 4.2**. The key characteristics and description of the character area provided in this assessment in presented in **Table 4.1**.

Table 4.1 Dogger Bank key characteristics

Dogger Bank (Character Area 1)
Key characteristics: • Extensive areas (sic) of relatively shallow waters; • Visually unified and expansive open water character; • Widespread sand bank habitat; • Expansive seascape with few surface features; • Important archaeological potential of 'Doggerland'; and • Large area designated for Round 3 wind farms." Description: The aesthetic and perceptual qualities are described as follows: "*Deeper waters of the North Sea are visually unified by merit of consistent horizons across extensive and unchanging tracts of open water. There is a much more remote and isolated quality to the seascape where sight of other marine vessels, swooping birds and other wildlife become more important within the sense of perception*. *Unlike the shallower coastal waters where tidal dynamics, prevailing weather conditions and land based orientating landmarks are perceptible, there is a sense of disorientation due to a lack of visual cues. Views of the seascape become more searching in nature as a consequence and the presence of offshore activity and wildlife add a sense of familiarity to an otherwise remote environment. […]* *With fewer visual associations views become much more panoramic in nature and the seascape becomes monochrome and monotonous in character. Climatic conditions influence the perception of seascape and sensory experiences of sounds and smells become more important."*

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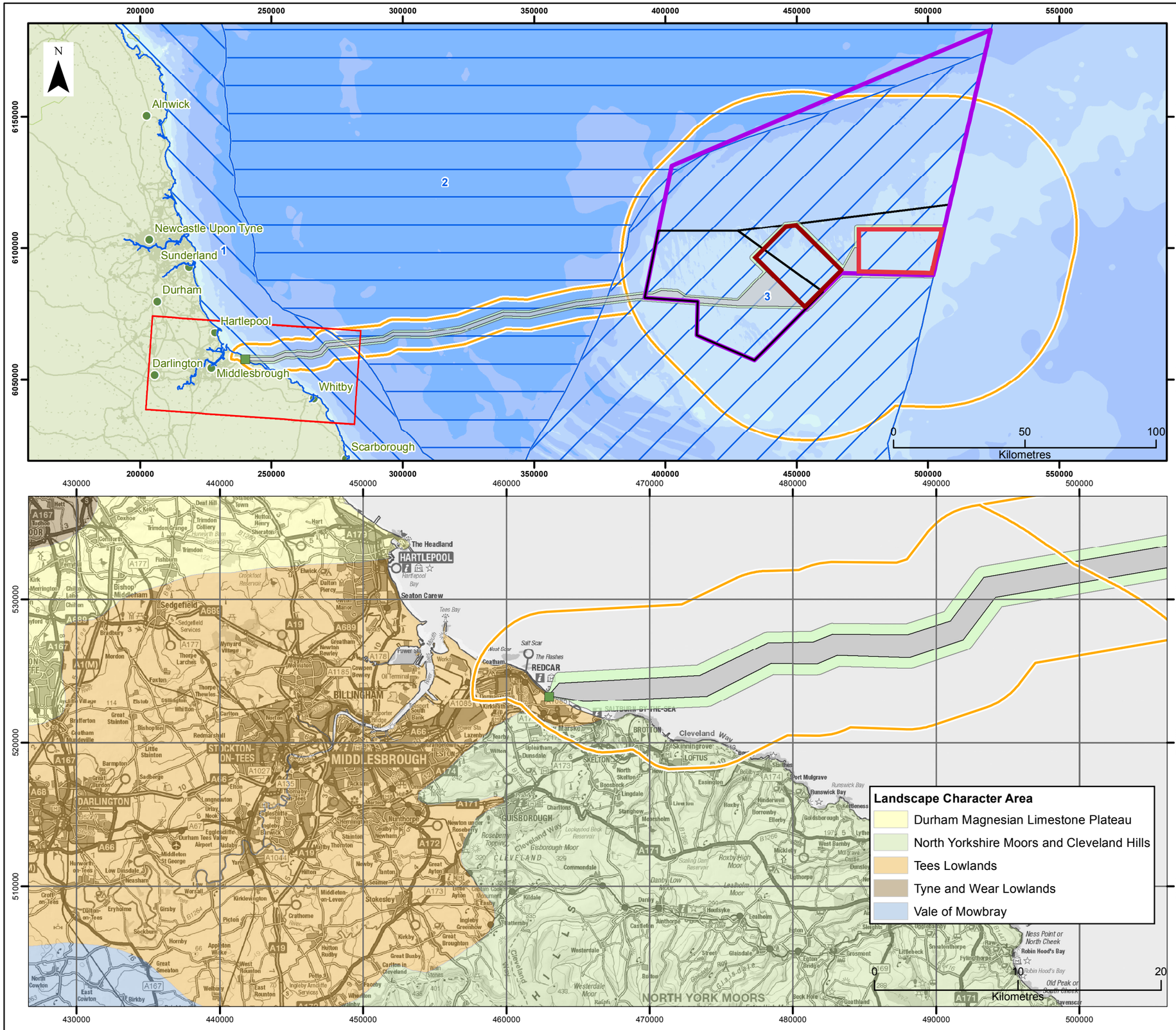

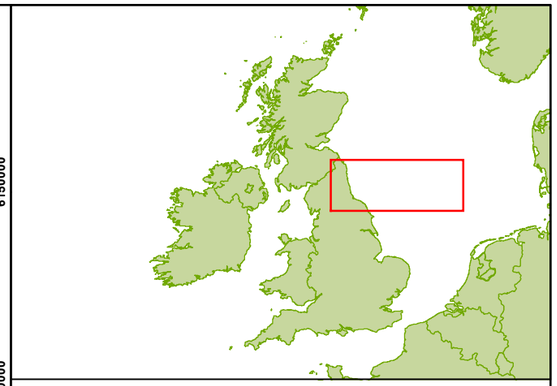

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Cable landfall envelope
- SVIA Study Area

Marine Plan Area

- 1. North East Inshore
- 2. North East Offshore
- 3. East Offshore

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.2 Landscape character and marine plan areas

VER	DATE	REMARKS	Drawn	Checked
1	11/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-402

SCALE	1:1,500,000	PLOT SIZE	A3	DATUM	WGS84 OSGB36	PROJECTION	UTM31N BNG

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4.2.8. Strategic seascape character assessments for the remainder of the Marine Planning Areas, including Marine Plan Areas 1 and 2 within the study area defined for this assessment, are likely to emerge in the future, but strategic characterisation studies are not currently available.

4.2.9. The coastal character of the landward part of the study area is described within the *Countryside Character of England, Volume 1: North East England landscape character assessment* published by Natural England (Countryside Commission, 1996). National Character Areas (NCAs) areas within the study area are shown on **Figure 4.2**. The landward part of the study area is located predominantly within *NCA 23 Tees Lowlands*. This character area comprises a broad, low-lying plain of gently undulating, predominantly arable farmland with wide views to distant hills. Part of the study area is also located within the *NCA 25 North Yorkshire Moors and Cleveland Hills*. NCA 25 is an area of upland plateau landscape which is dissected by a series of dales. A summary of the key relevant characteristics of the National Character Areas, as described in these studies, are provided below.

Table 4.2 National Character Areas: key characteristics

NCA 23 and NCA 25
NCA 23 Tees Lowlands: The *NCA 23 Tees Lowlands* character area, divided to the north and south by the River Tees, is characterised by the contrast of quiet rural areas and extensive urban and industrial development which is concentrated along the lower reaches of the Tees, the estuary and coast. Large scale chemical and oil refining works along the Tees estuary form a distinctive skyline by both day and night, and overhead transmission lines, pylons, motorway corridors and other infrastructure elements are widespread features, visible in views both along the coast and in views to land from the inshore waters. Woodland cover is generally sparse, with some local cover along the River Tees corridor and within parkland and managed estates. Extensive areas of mudflats, saltmarsh wetlands and dunes are located at the mouth of the River Tees, providing valuable habitats for wildlife and as such, are designated Sites of Special Scientific Interest (SSSI) and wildlife corridors in the Redcar and Cleveland Local Development Framework (RCLDF). NCA 25 North Yorkshire Moors and Cleveland Hills: *NCA 25 North Yorkshire Moors and Cleveland Hills* is an area of upland plateau landscape which is dissected by a series of dales. Towards the coast the landscape becomes more distinctive and dramatic, with high cliffs, small coves and bays, coastal towns and fishing villages.

Landfall and inshore area characterisation

4.2.10. The study area extends along a stretch of coast from Coatham Sands to the northwest Boulby to the southeast. Landward of MHW it extends across farmland and the settlements of Marske-by-the-Sea and the northern parts of Redcar, to the A174.

4.2.11. Across the area there are contrasts in the form, pattern and perceived naturalness of the coast, and more subtle contrasts in aspect and views. Tees Bay is enclosed by a generally low lying shoreline, centred on the Tees estuary, with narrow sand beaches. The edge is highly modified in areas associated with the mouth of the Tees estuary, Redcar and Hartlepool. The Tees estuary

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is characterised by major oil and chemical complexes, extensive port facilities and more recently the Teesside Offshore Windfarm, comprising 27 wind turbines, located at the mouth of the Tees. This is in contrast with the rugged cliffs and open farmland and incised wooded deans to the south of the area, where the North York Moors meets the coast.

4.2.12. To the south of Redcar, the shoreline is less modified. Wooden groynes and a concrete revetment between the town frontage and the beach at Redcar give way to low cliff banks and remnant dunes which characterise the shore at Marske Sands. There is a marked transition at the southern extent of the area, towards the headland at Warsett Hill and Huntcliff, where more elevated, rugged and varied topography predominates. To the southeast of Saltburn, the hinterland has a rural character and the coastal edge becomes progressively more sparsely settled. Within the south of the area high cliffs form an abrupt edge, allowing elevated views out to sea and along the coastline from the cliff edges.

4.2.13. The landfall is located towards the southern end of Marske Sands, to the north of Marske-by-the-Sea, immediately north of Long Beck, a small beck that is culverted at the A1085 and flows into the sea at Bydale Howle. Marske Sands comprises an intertidal sandy beach backed by low sandy cliff banks and remnant sand dunes. The beach itself is largely visually obscured from the flat agricultural land inland, away from the cliff edges. The A1085 follows the line of the coast, offset from the cliff edge by a narrow margin of grass and remnant dunes, and forms a prominent feature due to the movement of cars.

4.2.14. Long views are available from the low cliff banks and the Marske Sands beach to the south towards the headland at Warsett Hill. The headland forms the visual focus from this section of the coast, the dramatic high cliffs contrasting with the lower, densely developed coast to the north at Redcar and the mouth of the Tees. In views along the coastline, the sea itself forms the main focus, with its open and expansive nature contrasting with the large areas of industrial development and urban settlements that predominate inland. Large tankers and cargo ships are characteristic features on the skyline in seaward views, particularly in the direction of Teesmouth.

4.2.15. Within the area there are numerous coastal paths, including the long distance footpath The Cleveland Way. Redcar and Saltburn provide a local focus of recreational activity within the vicinity of the landfall, with numerous facilities available for land and sea-based recreation (see **Chapter 23**). The beach at Marske Sands is heavily used for recreation.

4.2.16. A summary of the attributes and qualities of the unit according to indicators of relative sensitivity to the proposed development and an evaluation of the overall sensitivity of the seascape unit are provided in **Table 4.3**.

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Table 4.3 Summary of landfall and inshore characterisation and sensitivity criteria

Landfall and inshore area	
Criteria / Evidence	**Evaluation**
Scale and openness Medium scale, predominantly open. Mostly with wide views available along the coast and to the sea, with some areas more enclosed, such as at Saltburn.	This is a medium scale and complex coastline, with high levels of human activity within the north of the area as well as and the inshore waters, indicating low sensitivity. The resources within the study area, which are considered to be of higher sensitivity, are recreational and include the beaches and networks of footpaths, the more natural features such as the rock outcrops, remnant sand dunes and cliffs. There is some existing activity within the inshore waters associated with large scale tankers, cargo vessels as well as fishing activity and recreational vessels, which indicates that the area could accommodate increased movement associated with the installation of the cable route without the character of the unit altering substantially. The sensitivity of the seascape unit is considered to be **low** overall.
Form Flat to gently undulating in the north, with narrow beaches, rock outcrops and modified coastal edges at the edges of Redcar and Hartlepool. More complex composition to the south, with high cliffs and wooded deans.	
Modifications/Remoteness/Sense of Naturalness Strong influence of large scale oil and chemical complexes, Teesport and other infrastructure particularly across the north of this seascape, with influence extending to the south of the area. Rock outcrops are present within the immediate inshore waters, and rugged cliffs contribute to a greater sense more naturalness within the south. However, this is predominantly a highly modified and managed coastal edge, with large scale industrial features and settlements present across much of the unit.	
Pattern and foci The pattern is relatively complex, with the coastline comprising partly enclosed stretches of beach along the bays, open elevated cliff tops and promontories where long views are available along the coast. Remnant dunes backing Marske Sands and enclosed deans (such as at Saltburn) form local areas where views are more contained. The headland at Warsett Hill forms an important focal point to the south and Hartlepool to the north.	
Lighting The area is extensively lit in the north by the industrial complexes across Teesside and coastal settlements. Within the inshore waters, existing lights present from large vessels.	
Movement There is movement associated with roads that follows close to the shoreline, the offshore wind farm and large vessels moving in and out of the Tees estuary. More natural, irregular, movement is associated with the cliffs to the south.	

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Landfall and inshore area	
Criteria / Evidence	**Evaluation**
Coastal aspect The aspect is predominantly to the east, northeast, or southeast. Coastal views are aligned towards the open sea, and the location of potential activities associated with the installation of the offshore cable route.	
How experienced The area is experienced from the beaches along the coastline, where focus is on beach activities, as well as footpaths that follow the shoreline. There are also a number of settlements with sea frontages, parking areas, and several recreational facilities dispersed along the coast. There are elevated positions along the coastline to the south, with views focused across the open sea as well as the expanse of Teesside.	
Quality/ condition The coastal edge is developed to the north, with modified edges, large areas of reclaimed and developed land at the Tees estuary. Parts of the hinterland are intensively farmed agricultural land of varying quality. The coastline is also subject to erosion, which in some localised areas, such as at the landfall, gives rise to a more degraded appearance.	

Offshore Export Cable Corridor

4.2.17. This unit is located within the North Sea, between the northeast coast of England and the area known as Dogger Bank. The area is composed entirely of open water, of depths ranging typically between 25m and 70m below Lowest Astronomical Tide (LAT), with no land mass present or discernible from within it.

4.2.18. The unit is visually simple, with subtle and transitional variations arising from changes in water depth, wave and water movement. There are no surface oil and gas platforms present within the Dogger Bank Teesside A & B Export Cable Corridor study area, as indicated in **Figure 4.3**, although large surface structures may be visible in surrounding seascape in distant views

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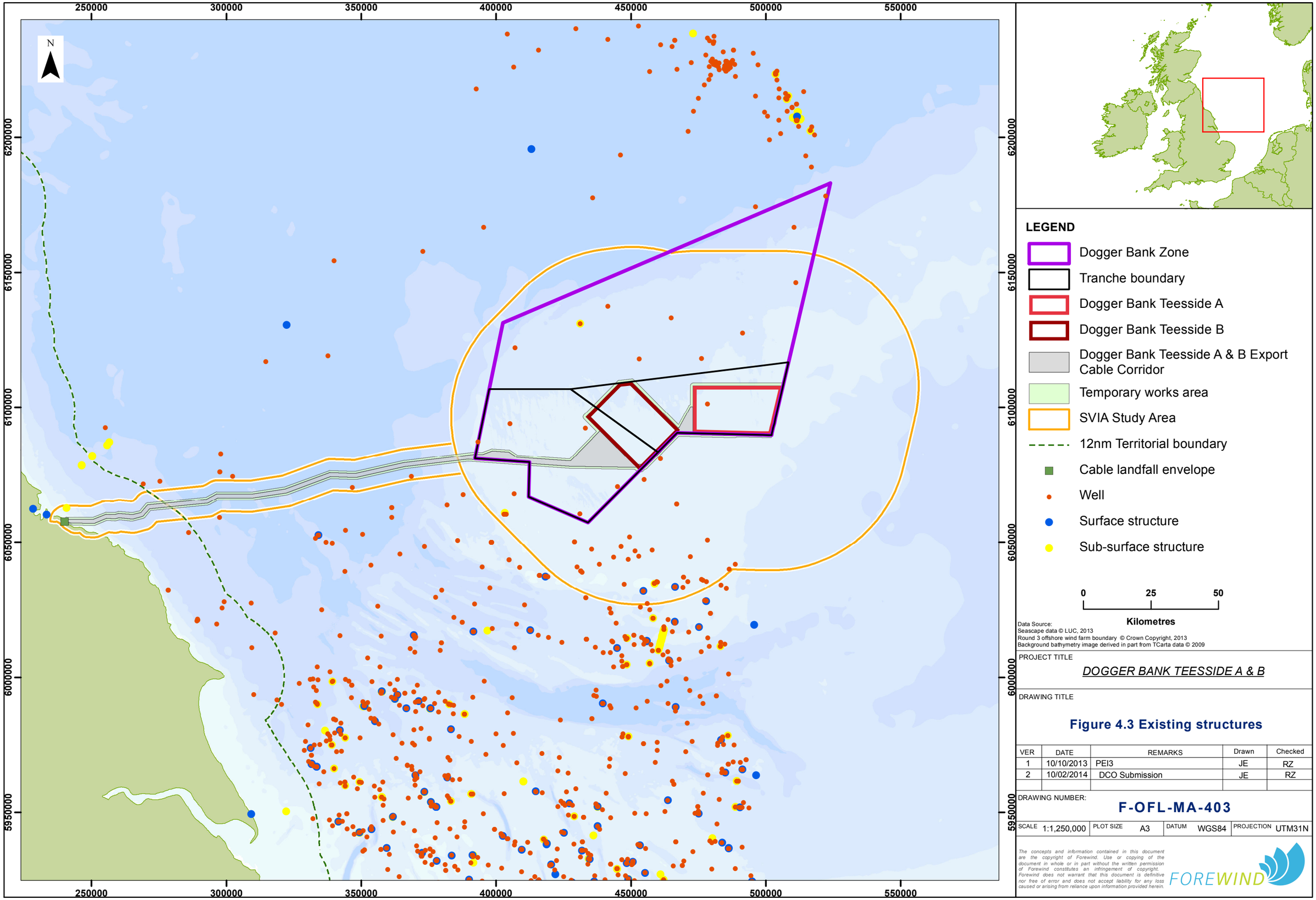

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- SVIA Study Area
- 12nm Territorial boundary
- Cable landfall envelope
- Well
- Surface structure
- Sub-surface structure

0 25 50

Kilometres

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.3 Existing structures

VER	DATE	REMARKS	Drawn	Checked
1	10/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-403

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,250,000	A3	WGS84	UTM31N

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4.2.19. Vessel activity, including commercial shipping, tankers and cargo vessels, passenger and fishing vessels, is most concentrated in the western parts of the route, towards the coast, as indicated by the marine traffic survey data presented in the Navigational Risk Assessment (NRA) Technical Report (**Appendix 16A**).

4.2.20. The Dogger Bank Teesside A & B Export Cable Corridor study area does not intersect with any RYA Cruising Routes. Localised areas may be valuable as recreational resources, centred on ship wreck sites used for diving. The density of sites decreases progressively towards the development area. The location of known wrecks within the offshore cable route area are shown in Figures 4.5 and 4.6 within **Chapter 23**

4.2.21. Key characteristics are:

- Open expanses of water;
- Dynamic and changing light and climatic conditions;
- Simple compositional relationship between sea, horizon and sky;
- Movement of recreational, commercial and fishing vessels; and
- 'Wildness' qualities, including remoteness and very limited visual evidence of human influences.

4.2.22. The attributes and qualities of the unit are provided in the following **Table 4.4** according to indicators of relative sensitivity to the proposed development. An evaluation is also provided of the overall sensitivity of the seascape unit.

Table 4.4 Summary of development area characterisation and sensitivity criteria

Offshore cable route area		
Criteria	**Evidence**	**Evaluation**
Scale and openness	Extensive area of open water of a vast scale, with extensive views to the horizon in all directions.	The area is extensive, large scale and simple in composition, which indicates a relatively low degree of sensitivity. Some perceptual qualities are more sensitive to change, particularly the low level of development and sense of remoteness from direct human influences. The area is broadly considered to be of **low** sensitivity overall.
Form	Simple, unified and horizontal.	
Modifications/ Remoteness/ Sense of Naturalness	Largely undeveloped seascape, with a high level of apparent naturalness. A high perceptual degree of remote and isolation. There is some surface infrastructure present to the northeast of the Export Cable Corridor, associated with oil and gas extraction, although this is limited across the remainder of the route.	

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Offshore cable route area		
Criteria	**Evidence**	**Evaluation**
Pattern and foci	Simple pattern and almost entirely lacking in elements or focal points that would allow a sense of orientation or location.	
Lighting	The area is largely unlit at night, with some limited lighting from vessels moving across the area.	
Movement	Movement across the area is highly natural.	
Coastal aspect	N/A	
How experienced	From passing passenger ferries, commercial shipping and fishing vessels.	
Quality/ condition	The area, as discernible at surface level, is largely intact, with few permanent man-made structures and limited influence form oil and gas extraction operations.	

Dogger Bank Teesside A & B development area

4.2.23. Dogger Bank Teesside A & B are proposed within an area identified within the *Seascape Characterisation Around the English Coast* pilot study (Natural England, 2012), as Area 1: Dogger Bank. The key characteristics and description of the character area provided in this assessment are presented in **Table 4.5**.

Table 4.5 Dogger Bank Seascape Character Area

Dogger Bank (Character Area 1)	
Key Characteristics	• "*Extensive areas (sic) of relatively shallow waters;* • *Visually unified and expansive open water character;* • *Widespread sand bank habitat;* • *Expansive seascape with few surface features;* • *Important archaeological potential of 'Doggerland';* • *Large area designated for Round 3 wind farms."*
Description	The aesthetic and perceptual qualities are described as follows: *"Deeper waters of the North Sea are visually unified by merit of consistent horizons across extensive and unchanging tracts of open water. There is a much more remote and isolated quality to the seascape where sight of other marine vessels, swooping birds and other wildlife become more important within the sense of perception.*

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Dogger Bank (Character Area 1)	
	Unlike the shallower coastal waters where tidal dynamics, prevailing weather conditions and land based orientating landmarks are perceptible, there is a sense of disorientation due to a lack of visual cues. Views of the seascape become more searching in nature as a consequence and the presence of offshore activity and wildlife add a sense of familiarity to an otherwise remote environment. […] *With fewer visual associations views become much more panoramic in nature and the seascape becomes monochrome and monotonous in character. Climatic conditions influence the perception of seascape and sensory experiences of sounds and smells become more important."*

4.2.24. The area within which Dogger Bank Teesside A & B is proposed comprises a large shoal with shallow water depths averaging less than 30m. The area is composed entirely of open water, of depths ranging typically between 25m and 50m below LAT, with no land mass present or discernible from within it.

4.2.25. The area is today widely known as a fishing ground, and is of archaeological importance. The area is part of Doggerland, a low-lying landmass which is now submerged. There are wider cultural associations with the area as a sea area referred to in Radio 4's Shipping Forecast, delivered on behalf of the Maritime and Coastguard Agency.

4.2.26. The fishing vessels, cargo ships and tankers passing through the area are transient visible features.

4.2.27. Within the development area, small-scale navigation features provide some degree of visible orientation. There are no permanent larger scale surface features within the study area, such as platforms associated with oil and gas extraction. There is some existing surface infrastructure present within the vicinity of the Export Cable Corridor, including larger features associated with oil and gas extraction. These, as well as occasional navigational features, provide a degree of orientation and mark particular locations.

4.2.28. The following table provides a summary of the attributes and qualities of the unit according to indicators of relative sensitivity to the proposed development and an evaluation of the overall sensitivity of the seascape unit provided in **Table 4.6**.

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Table 4.6 Summary of development area characterisation and sensitivity criteria

Dogger Bank Teesside A & B development area	
Criteria	**Evaluation**
Scale and openness Vast scale area of open sea, with open views.	The area is extensive, large scale and simple in composition, which indicates a relatively low degree of sensitivity. However, some perceptual qualities are more sensitive to change, particularly the lack of development and sense of remoteness from direct human influences. The overall sensitivity of the area is considered to be low for all criteria.
Form Simple, flat and horizontal	
Modifications / Remoteness / Sense of Naturalness Largely undeveloped seascape, with a high level of apparent naturalness. A high perceptual degree of remoteness and isolation.	
Pattern and foci Simple pattern and almost entirely lacking in elements or focal points that would allow a sense of orientation or location.	
Lighting The area is largely unlit at night, with some limited impact of lights from sea traffic.	
Movement Movement across the area is highly natural. Passenger ferries and large commercial vessels pass through parts of the area at relatively frequent intervals	
Quality/ condition The area, as discernible at surface level, is undeveloped, with very few permanent man-made structures and limited influence from oil and gas extraction operations.	

4.3. Visual baseline

4.3.1. In order to assess short-term visual impacts during the construction phase, potential land-based visual receptors along the coast and sea-based receptors within the study areas were identified. All potential sea-based receptors identified are transitory, in contrast to the fixed locations identified for the land-based visual receptors. Broad categories of potential visual receptors are therefore recorded, based on survey RYA Cruising Routes GIS data (RYA 2010) and vessel tracking data presented in the NRA Technical Report (**Appendix 16A**).

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4.3.2. It is noted that the Sharing the Wind (RYA, 2004) report acknowledges that recreational sailing and powered vessels are highly seasonal and diurnal. The RYA information on recreational cruising routes classified as Heavy, Medium and Light Use. Within the defined study areas for this assessment a number of Medium Recreational Routes are plotted. These are classified as “Popular routes on which some recreational craft will be seen at most times during summer daylight hours” (RYA 2010). These are however not designated courses, but should be understood as generalised indications of directions of travel between specific destinations that have been identified as being popular with recreational craft.

Landfall and inshore area

4.3.3. Land-based receptors include residential receptors at the seafronts in Redcar, Marske-by-the-Sea and Saltburn, land-based recreational receptors using the beaches and the public rights of way that run parallel to Marske Sands and Redcar Sands, as well as those at Zetland Park and Warsett Hill. The indicative locations of land-based receptors are shown on **Figure 4.4**.

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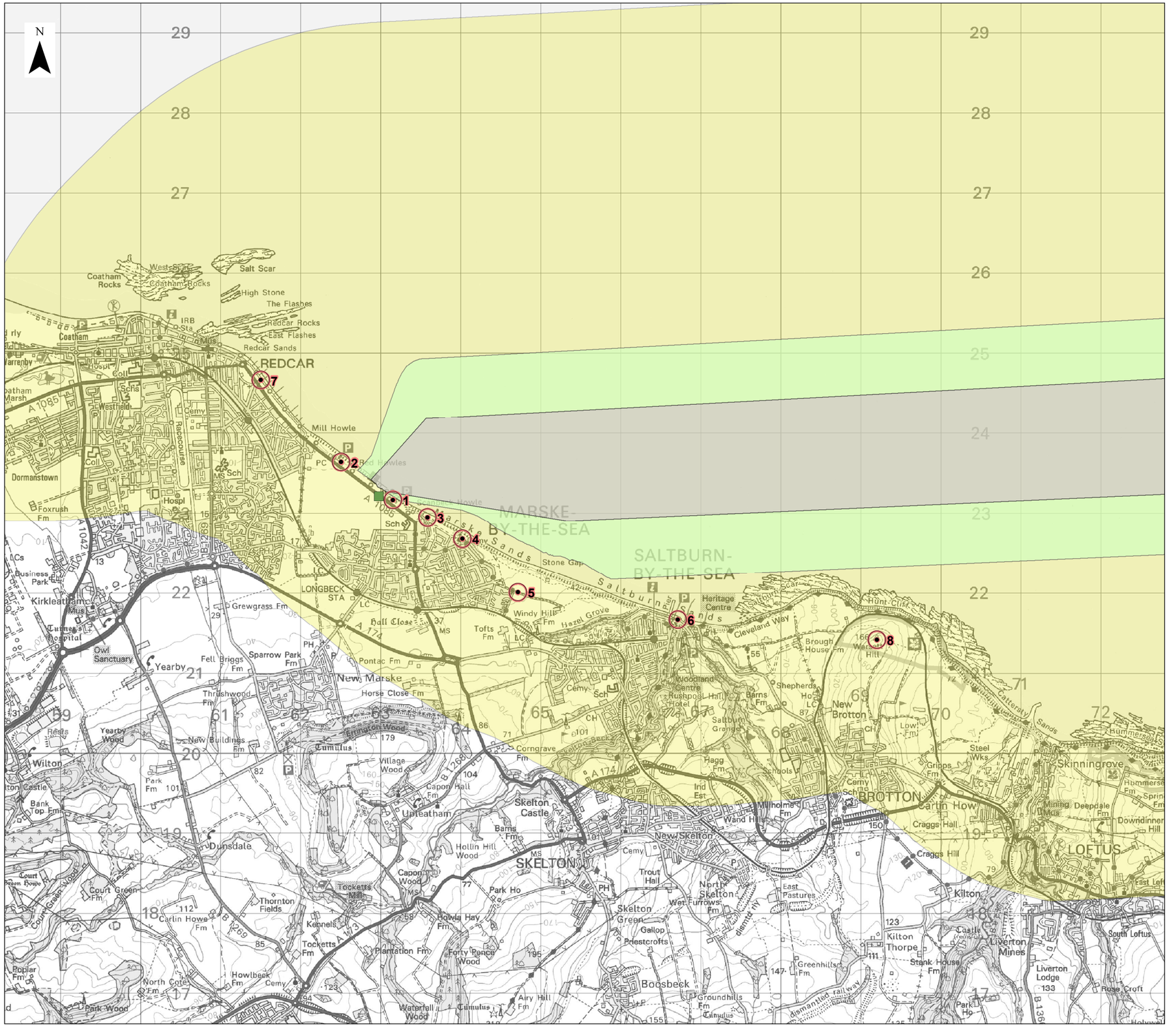

LEGEND

- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Cable landfall envelope
- SVIA Study Area
- Assessment location
  1. Bydale Howle, Marske Sands
  2. Millclose Howle Car Park
  3. Valley Gardens, Marske Sands
  4. Church Howle, Marske-by-the-Sea
  5. Windy Hill Farm and Windy Hill Lane, Marske-by-the-Sea
  6. Saltburn Pier and promenade
  7. Zetland Park, Redcar Sands
  8. Warsett Hill

0 1 2

Kilometres

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.4 Indicative locations of land-based receptors

VER	DATE	REMARKS	Drawn	Checked
1	10/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-403

SCALE	1:50,000	PLOT SIZE	A3	DATUM	OSGB36	PROJECTION	BNG

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4.3.5. Water-based receptors include recreational sailing vessels within the inshore area, with an active sailing club present at Redcar and popular cruising routes nearby. There may also be sea-based recreational vessels present within Hartlepool Bay, as well as further off-shore.

4.3.6. Land-based receptors and water-based receptors potentially affected by Dogger Bank Teesside A & B are identified in **Table 4.7**.

Table 4.7 Landfall and inshore study area visual receptors

Receptor	Type and sensitivity (H: Residential, R: Recreational, T: Travelling)	Description
1: Bydale Howle, Marske Sands	R, T Medium	Representative of views from the beach as well as from the low cliffs backing the beach. This receptor is also a proxy for travelling receptors along the A1085. A Public car park is located to the south, between the Marske Sands foreshore and the A1085.
2: Millclose Howle, Redcar Sands	H, R, T Medium	Representative of views from Redcar Sands, to the northwest of the landfall. A public car park is located in the vicinity, between the Marske Sands foreshore and the A1085. This receptor is also a proxy for travelling receptors along the A1085 and residential receptors at the edge of Redcar.
3: Valley Gardens, Marske Sands	H, R High	Representative of residential and recreational receptors on the beach at the northern edge of the north of Marske-by-the-Sea.
4: Church Howle, Marske-by-the-Sea	H, R High	Representative of views from the Church and Church yard as well as from the Public Right of Way (PRoW) that follows the top of a low mud cliff that backs Marske Sands. A number of properties at the northern edge of Marske-by-the-Sea with a seaward aspect are also present here.
5: Windy Hill Farm and Windy Hill Lane, Marske-by-the-Sea	H, R High	Representative of visual receptors at Wind Hill Farm, the residential properties facing into Wind Hill Lane with seaward views as well as users of the PRoW that follows the lane.
6: Saltburn Pier and promenade	H, R Medium	Representative of views from Saltburn, a seaside resort, from the lower promenade and a pier at the foot of a steep cliff. The town itself is more elevated, with views available overlooking the sea from the marine parade. This location lies at the northern boundary of the Heritage Coast, representing seaward views from the north-western extent of the area.
7: Zetland Park, Redcar Sands	H, R Medium	Representative of views from properties fronting Redcar Sands and recreational receptors at Zetland Park (an open and exposed strip of amenity grass between the beach and the town frontage, heavily used for recreation) and the beach on Redcar Sands.
8: Warsett Hill	R Medium	Representing recreational receptors on open access land at Warsett Hill (trig point) and a proxy for users of the Cleveland Way long distance footpath at Huntcliff. Located within the Heritage Coast, representing seaward views from the north-western extent of the area.

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Offshore Dogger Bank Teesside A & B Export Cable Corridor and Dogger Bank Teesside A and Dogger Bank Teesside B development area

4.3.7. Potential sea-based receptors include recreational receptors on sailing boats and cruising yachts, small to large scale fishing vessels, as well as receptors present on larger commercial shipping vessels. The sensitivity of these receptors are identified in **Table 4.8**.

4.3.8. As indicated in **Figure 4.5**, the Dogger Bank Teesside A development study area is intersected with a RYA cruising route, and a further route passes to the north of the Dogger Bank Teesside A & B development areas within approximately 10km at its nearest point. The RYA Cruising Routes are classified as medium use, indicating that there are some popular routes along which recreational craft may be regularly present. Further information on vessel types and frequency of movements is presented in the NRA Technical Report (**Appendix 16A**). The Dogger Bank Teesside A & B Export Cable Corridor study area is not intersected by any RYA Cruising Routes.

Table 4.8 Export cable route and development area visual receptors

Receptor	Type and sensitivity (H: Residential, R: Recreational, T: Travelling)	Description
Sailing vessels	R, Medium	Representing recreational vessels such as yachts.
Fishing vessels	T, Low	Representing receptors working on commercial fishing vessels.
Cargo ships and tankers	T, Low	Representing receptors working on cargo ships and tankers.

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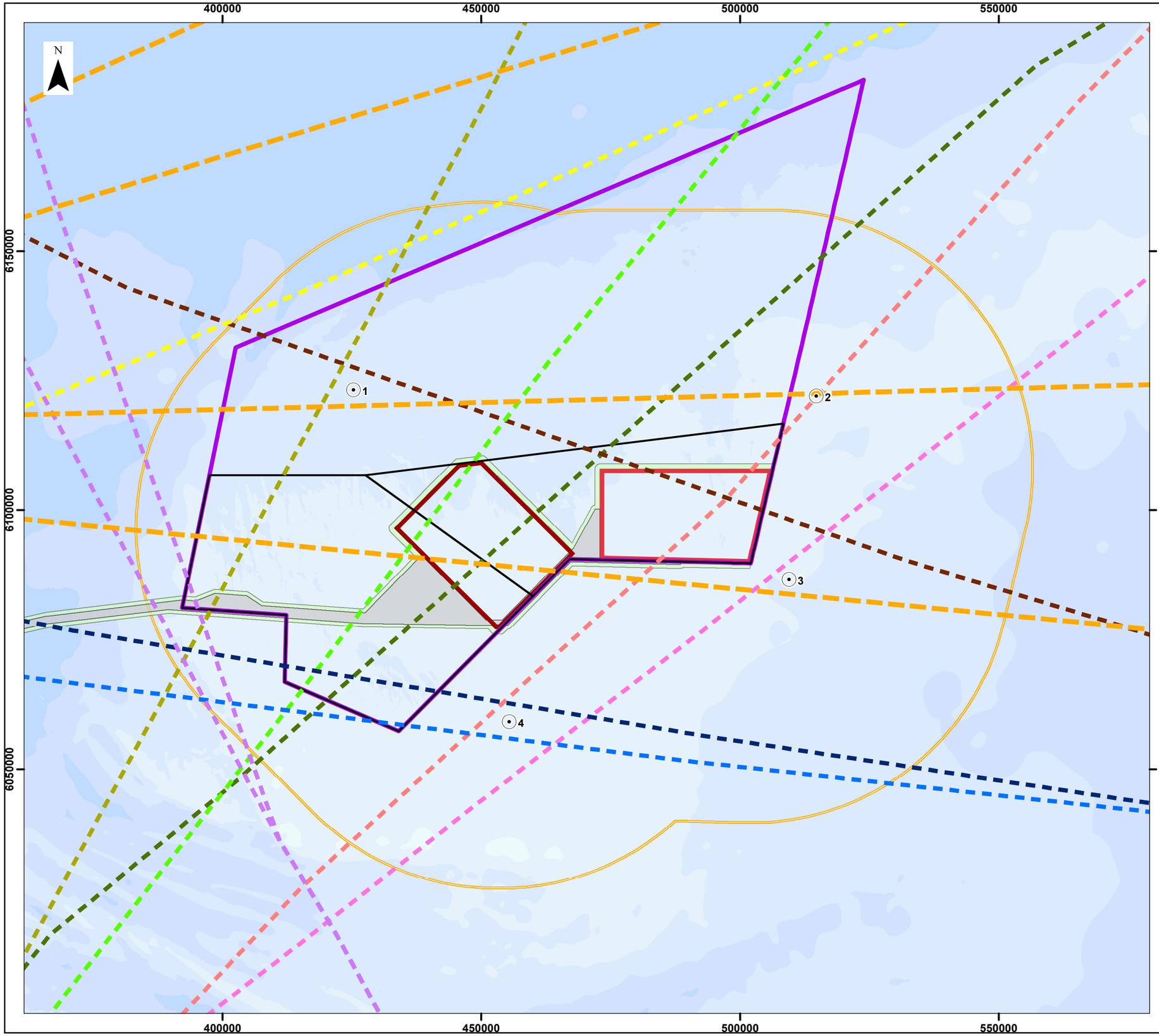

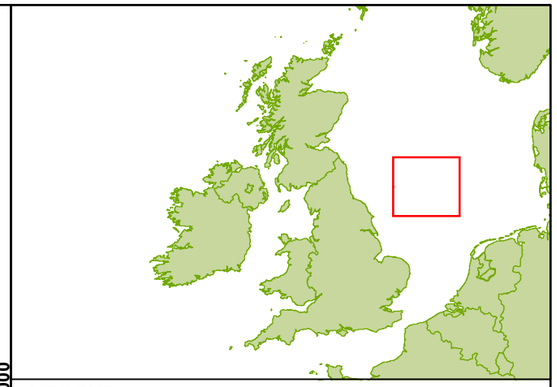

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Dogger Bank Teesside A & B - 50km buffer
- Indicative viewpoint
- RYA North East cruising route

Shipping routes

1 6
2 7
3 8
4 9
5 10

0 10 20
Kilometres

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.5 Indicative viewpoint locations

VER	DATE	REMARKS	Drawn	Checked
1	07/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-405

SCALE	1:750,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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4.3.9. Main routes identified within 50km of Dogger Bank Teesside A & B in the NRA Technical Report (**Appendix 16A**) indicates generalised routes based on Automatic Identification System (AIS) survey information. Information on the vessel types and numbers and route description is provided in the NRA Technical Report and summarised in **Table 4.9**. The routes are plotted on **Figure 4.5**.

Table 4.9 Export cable route and development area visual receptors

Route	Description	Vessel Numbers	Vessel Types
2	Immingham, UK and Tananger, Norway	1 vessel every 4 days	Predominantly cargo
3	Immingham, UK and Egersund, Norway	1 vessel every 13 days	Predominantly cargo and tankers
4	Hull/Grimsby, UK and Helsinki, Finland	1 vessel every 12 days	Predominantly cargo
6	Immingham, UK and Moss, Norway	1 vessel every 3 days	Predominantly cargo and tankers
8	Rotterdam, The Netherlands and Straumsvil, Reydarfjordur, Iceland	1 vessel every 5 days	Predominantly cargo
9	Newcastle, UK and Hamburg Germany	1 vessel every 13 days	Predominantly cargo
10	NE UK and Germany	1 vessel every 16 days	Predominantly cargo

4.3.10. A selection of indicative viewpoints have been selected to illustrate potential views of the wind farm development from areas where a higher concentration of receptors are likely to be present, based on both the main routes identified and RYA data. The locations of these are shown on **Figure 4.5**.

4.4. Historic seascape character

4.4.1. Descriptions and discussion of historic seascape character and sensitivity ratings are provided at the ‘sub-type’ level. Surface historic seascape areas within the study area are shown on **Figure 4.6** and **Figure 4.7**. This is considered to provide a level of detail commensurate with the predicted impacts of the proposed development. Where perceptions of historic seascape

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character are strongly linked to past uses, events or associations, these are highlighted separately, drawing information from the 'previous subtypes' recorded in the HSC dataset and associated documentation.

Landfall and inshore area

Description

4.4.2. The settlement of Redcar was a popular Victorian resort town, although it is currently more widely identified as an industrial area, with particularly strong links to steel-working and, latterly petrochemicals. The historic core of the town is situated around 2km northeast of the cable landfall.

4.4.3. The Teesside Offshore Windfarm, approximately 1.5km offshore at the mouth of the Tees is a large and visually distinctive feature across the area, immediately adjacent to the extensive industrial complex of the Teesside Works, Teesport and the Teesside Refinery.

4.4.4. Frequent, often large-scale, maritime traffic is a key feature of the inshore seascapes of the study area. Teesport is one of the largest commercial ports in the UK with notable numbers of container, bulk cargo and petrochemical vessels passing through the study area. Hartlepool, around 8km to the north, is also a major port and accounts for additional maritime traffic readily visible from shore.

4.4.5. Redcar maintains a small inshore fishing fleet, largely utilising traditional coble vessels often launched from trailers directly on the beach. They are a characteristic feature of the inshore seascape and an important link to the pre-industrial heritage of the area.

4.4.6. Recreational sailing is a feature of the inshore area, with an active sailing club in Redcar and popular cruising routes nearby. Similarly, recreational fishing is popular and ranges from small-scale shellfish collection and rod fishing from shore to organised day-trips on small vessels operating locally.

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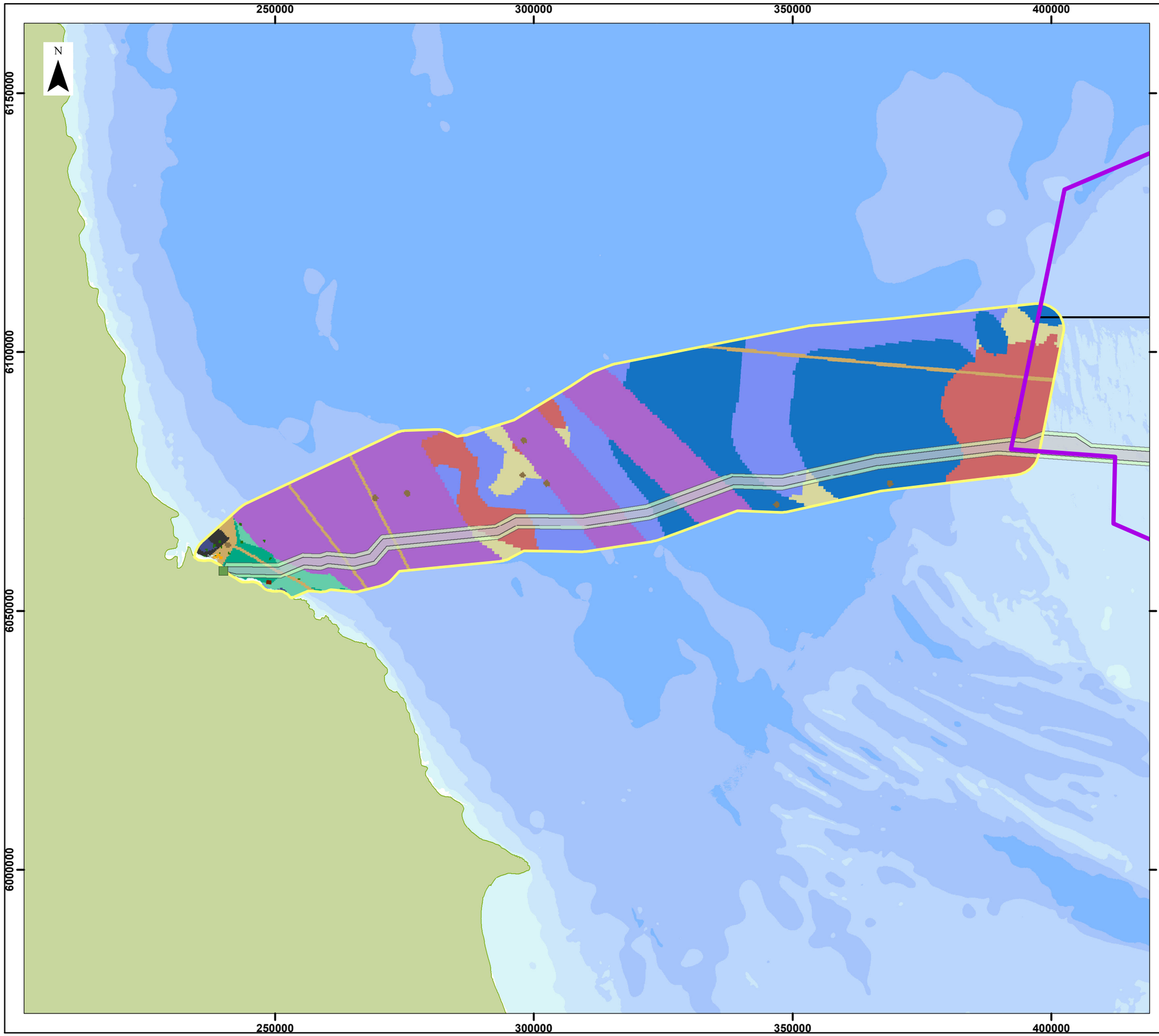

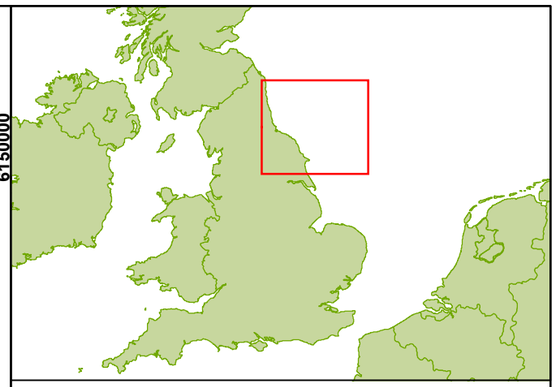

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A & B study area
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Cable landfall envelope

Historic seascape surface area

- Anchorage
- Dangerous wreck
- Demersal trawling
- Dive site
- Fishing ground
- Fixed netting
- Harbour
- Hydrocarbon installation
- Leisure fishing
- Leisure sailing
- Longlining
- Mixed maritime activity
- Navigation route/area
- Renewable energy installation
- Rocky foreshore
- Seine netting

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

0 10 20
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.6 Dogger Bank Teesside A & B export cable corridor historic seascape areas

VER	DATE	REMARKS	Drawn	Checked
1	10/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-406

SCALE	PLOT SIZE	DATUM	PROJECTION
1:750,000	A3	WGS 84	UTM 31

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400000
450000
500000
6150000
6100000
N

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Dogger Bank Teesside A & B study

Historic seascape surface areas

- Anchorage
- Demersal trawling
- Dive site
- Fishing ground
- Fixed netting
- Harbour
- Hydrocarbon installation
- Leisure fishing
- Leisure sailing
- Longlining
- Mixed maritime activity
- Navigation route/area
- Pelagic trawling
- Renewable energy installation
- Seine netting

0 10 20
Kilometres

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.7 Dogger Bank Teesside A & B historic seascape areas

VER	DATE	REMARKS	Drawn	Checked
1	10/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-407

SCALE	1:500,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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Sensitivity of surface HSC sub-types

4.4.7. The sensitivity ratings provided relate to construction activities only, as the presence of sub-sea export cables will have no residual effect on the perception of surface historic seascape character.

4.4.8. It should be noted that assessment of sensitivity relates to the HSC sub-types as receptors, rather than associated users (e.g. the sensitivity of leisure sailing as an aspect of character – as opposed to recreational sailors as a receptor of effects). This is discussed separately in **Table 4.10** below.

Table 4.10 Sensitivity of inshore sea surface HSC sub-types

Sea surface HSC sub-type	Sensitivity	Notes / rationale
Leisure sailing	Medium	The sails of small vessels are visible over a considerable distance from the shore, and are part of the character of the inshore seascape. Their temporary absence or relocation due to cable-laying operations could result in a short term change in character and, as such, sensitivity is medium.
Leisure fishing	Low	The presence of recreational fishing vessels contributes to a general sense of the inshore area being well used. However, their presence is not historically or culturally notable. Vessels are unlikely to be read as a single class by viewers. As such, sensitivity is low.
Dangerous wreck	Low	The ability to discern and appreciate the presence of such sites from the surface depends either on detailed historical knowledge, access to hydrographical charts or an interest in diving. However, cable-laying operations will not alter this, as vessels (and cables) will continue to avoid these locations (likely to be the principal surface expression of this element of HSC). Sensitivity is low.
Navigation route/area	Low	Frequently-trafficked shipping routes may be an expression of the continuation of the wider region's maritime heritage and overseas links. However, it is likely that the traffic to Teesport and Hartlepool is sufficiently frequent that the general presence of cable-laying vessels will not be remarkable. Similarly, any disruption to patterns of shipping is likely to be so short-lived as to be imperceptible. Sensitivity is low.
Hydrocarbon installation	Low	No surface installations are present. Therefore, the ability to discern and appreciate the presence of such sites depends either on detailed knowledge, or access to technical industry information/hydrographical charts. Cable-laying will not alter the perception or appreciation of such locations. Sensitivity is low.
Long-lining	Low	The presence of (generally relatively small) long-lining vessels is intermittent and geographically varied. It is, therefore, assumed that any change in patterns of use will be imperceptible in the context of wider variations in presence and distribution of

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Sea surface HSC sub-type	Sensitivity	Notes / rationale
		such vessels (e.g. resulting from weather conditions or location of target species). Sensitivity is low.
Renewable energy installation	Low	The planned development is of the same type, therefore cable-laying operations are broadly consistent with the character of the existing offshore wind farm. Sensitivity is low.
Harbour	Low	The industrialised character of the Teesport complex means that the sensitivity of the harbour area and approaches to the presence of cable-laying vessels is low – as these are generally consistent with the large-scale commercial traffic of the port (albeit holding position for longer periods).
Fixed netting	Medium	The working of inshore fixed nets is culturally notable, and maintains links with the area's pre-industrial maritime heritage. Fixed nets are more spatially-specific than other inshore finfish fisheries. Sensitivity is medium.
Dive site	Medium-low	Although the activity of diving in itself is not culturally notable, it is understood that the inshore wrecks (notably that of the Montauban, the Dimitris and the Hendrika) are popular with recreational divers. Whilst divers are a high sensitivity receptor, the character of the type itself is unlikely to be affected. Sensitivity is medium to low.

Past character

4.4.9. Redcar and Cleveland, like the majority of the coastal UK, has a long history of fishing and seafaring. The lack of natural harbours in the long, sandy coastline, and the consequent development and retention of beach launched cobles as the dominant inshore vessel type means that the historic settlements in the study area do not have a harbour at their heart[3]. Instead, the cobles are parked on trailers along the esplanade in Redcar, creating a more diffuse, but strongly apparent, connection to the now much-reduced fishing industry. In Marske-by-the-Sea, cobles are hauled up the beach to the end of the High Street, which retains the form (if not the buildings) of its post-medieval origins.

4.4.10. The presence of this small-scale traditional fishery ensures continuity with the past uses of the inshore area that is readily perceptible to local people and visitors alike.

[3] Unlike, for instance, Staithes or Whitby on the rockier coast of the North York Moors National Park to the south

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Additional receptors

4.4.11. In the inshore area, it is likely that the effects on historic seascape character will principally be experienced by recreational users and the small inshore fishing fleet. This represents a diverse group of interests comprising:

- Leisure sailing craft and motor vessels;
- Recreational anglers and shellfish collectors;
- Recreational divers; and
- Commercial fishing crews.

4.4.12. This group are likely to have a greater degree of interest in and appreciation of the maritime heritage of the area.

Dogger Bank Teesside A & B Export Cable Corridor

4.4.13. Sensitivity ratings are provided in **Table 4.11** below, and relate to construction activities only, as the presence of sub-sea export cables will have no residual impact on the perception of surface historic seascape character.

Table 4.11 Sensitivity of offshore cable route, sea surface HSC sub-types

Sea surface HSC sub-type	Sensitivity	Notes / rationale
Navigation route/area	Low	Frequently-trafficked shipping routes may be an important expression of the continuation of the wider region's maritime heritage and overseas links. Observed data suggests that high levels of usage of the seaways by large-scale commercial traffic – particularly en route to Teesport and Hartlepool – reduces the sensitivity of this character type to the presence of cable-laying vessels. While their movement patterns will be different, they will also be a short-lived transient presence (unlike, for instance, jack-up turbine installation vessels that are both strikingly different in form and remain stationary for long periods). Sensitivity to such a change is low.
Seine netting	Low	The presence of seine-netters is intermittent and geographically varied, in response to presence/absence of target species, tide and weather conditions. Sensitivity is low.
Hydrocarbon installation	Low	No surface installations are present. Therefore, the ability to discern and appreciate the presence of such sites (capped wells/former rig locations) depends either on detailed knowledge, or access to technical industry information/hydrographical charts. Cable laying will not alter the perception or appreciation of such locations. Sensitivity to such a change is low.
Long-lining	Low	The presence of (generally relatively small) long-lining vessels is intermittent and geographically varied. It is assumed that any change in patterns of use will be imperceptible in the context of wider variations in presence and distribution of such vessels (e.g. resulting from weather conditions or location of target species). Sensitivity to such a

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Sea surface HSC sub-type	Sensitivity	Notes / rationale
		change is low.
Fishing ground	Low	The presence of unspecified commercial fishing vessels is also likely to be intermittent, due to similar factors. Sensitivity to such a change is low.
Seine netting		
Demersal trawling	Low	Demersal trawlers are potentially more strongly influenced by seabed conditions and may be slightly more restricted in their distribution than those pursuing pelagic species. However, sensitivity to change is judged to be low.
Leisure sailing	Medium	Three cruising routes cross the study area, although are unlikely to be a key aspect of character. Traffic is likely to be intermittent. Sensitivity to such a change is medium.

Past character

4.4.14. Much of the route passes through a former[4] submarine exercise area (although this is recorded in relation to the water column in the HSC data, it is included for completeness here). The wider perception of this is likely to be limited to submariners and fishermen working the area while it was active. Intrinsically, submarine activity will be largely imperceptible on the surface.

4.4.15. The majority of past uses/character recorded for the cable route relates to historical fishing activity and navigation activity.

Additional receptors

4.4.16. Additional receptors within the offshore cable corridor will be fishermen, other professional seafarers and passengers on commercial vessels. Professional sailors are likely to have a detailed understanding of the physical form of the seabed from hydrographic charts and, particularly in the case of demersal trawlers, from sonar. However, their level of appreciation of historic seascape character on the surface is potentially limited. Local fishermen are likely to have some appreciation of the historical patterns of fishing practiced in particular areas. Naval personnel are more likely to be aware of the former submarine exercise area, although it is not considered to be of particular historical importance.

Dogger Bank Teesside A & B development area

4.4.17. Sensitivities in relation to both construction and operational phases are provided in **Table 4.12**.

[4] It is understood that current Royal Navy submarine exercise areas are located off the west coast of Scotland, in the Irish Sea and off the Devon and Cornwall coast. http://www.dft.gov.uk/mca/mcga-mnotice.htm?textobjid=DFC8865FF76CA909 (This Maritime and Coastguard Agency, 2012)

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Table 4.12 Development area, sea surface HSC sub-types

Sea surface HSC sub-type	Sensitivity		Notes / rationale
	Construction	Operational	
Leisure sailing	Low	Medium	Leisure sailing within the development area is likely to be restricted to offshore cruising routes. However, use will be sporadic and changes will be largely imperceptible to all but users of the routes. As far as can be discerned, the routes within the development area have no specific historical value.
Hydrocarbon installation	Low	Low	There are no active installations within the development area; these examples of the sub-type are likely to be former rig, well or other infrastructure locations. While these sites may be recorded on charts, wider perceptions of their physical location, as opposed to the perception of hydrocarbon extraction at a more general level, are likely to be very limited.
Pelagic trawling	Low	Low	The presence of trawlers is likely to be intermittent and perceptible principally to other fishing vessels and commercial vessels using main shipping lanes.
Seine-netting	Low	Low	
Demersal trawling	Low	Low	

Past character

4.4.18. Much of the development area lies within the assumed engagement area for at least three historical naval battles, including:

- 1781 Battle of Dogger Bank:
  - During the fourth Anglo-Dutch War (part of the American War of Independence);
- 1904 ‘Dogger Bank Incident’, during the Russo-Japanese War;
  - Russian warships en route to the Far East somehow mistook a fleet of British trawlers for Japanese torpedo boats and fired on them, and each other, resulting in loss of life on both ‘sides.’ This caused a major diplomatic incident between Britain and Russia. The event is commemorated by a memorial erected in Hull to the three trawlermen who died in the incident;
- 1915 Battle of Dogger Bank:
  - Relatively minor engagement, consisting of British interception of a smaller German squadron resulting in the sinking of the German cruiser SMS Blucher; and

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- 1916 Battle of Dogger Bank:
  - Attack by German torpedo boats on four British minesweepers.

4.4.19. However, although some of this history is likely to be known to seafarers using the area, the position of the engagements is likely to be generic to the whole bank, rather than specific areas.

4.4.20. The development site is located on the Dogger Bank, formerly 'Doggerland,' a land-bridge connecting eastern England to the continent, an area of high Palaeolithic and Mesolithic archaeological potential that was inundated during the early Holocene. Despite this, outside of archaeological community knowledge, understanding and appreciation of this aspect of the North Sea's history is very limited. Fishermen working on bottom trawlers may have a better understanding of the cultural heritage of Dogger Bank due to the occasional recovery of cultural material in fishing nets.

Additional receptors

4.4.21. Additional receptors within the vicinity of Dogger Bank Teesside A & B will be fishermen, other professional seafarers and passengers on commercial vessels.

4.4.22. As noted above, the perceptions of professional seafarers will be strongly coloured by their activities and understanding of the heritage of the region. The extent to which the majority of navigators will be aware of the importance of Dogger Bank as a fishing ground will vary depending on their origins, although knowledge of the range of techniques employed, and in which locations, is likely to be limited. British, and particularly local, fishermen are likely to have a much stronger appreciation of the historical patterns of exploitation in the area.

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5. Assessment of Impacts – Worst Case Definition

5.1. Introduction

5.1.1. This section establishes the realistic worst case scenarios for seascape and visual receptors as a basis for the subsequent assessment. Full details of the range of development options being considered by Forewind are provided within **Chapter 5** of this ES. For the purpose of the seascape and visual assessment, the realistic worst case scenario, taking these options into consideration, is set out in **Table 5.1**.

5.1.2. The design parameters detailed under each specific impact are those which have the main potential to influence the level of impact experienced by the relevant receptor. If the design parameter is not detailed, it is not considered that it will have a material bearing on the outcome of the assessment.

5.1.3. The realistic worst case scenarios identified here are also applied to the Cumulative Impact Assessment. When the worst case scenarios for the project in isolation do not result in the worst case for cumulative impacts, this is addressed within the Section 10 and summarised in **Chapter 33 Cumulative Impact Assessment** of this ES.

5.2. Construction scenarios and realistic worst case

5.2.1. There are a number of key principles relating to how the projects will be built, and that form the basis of the Rochdale Envelope[5] (see **Chapter 5**).These are:

- The two projects may be constructed at the same time, or at different times;
- If built at different times, either project could be built first;
- Offshore construction will commence no sooner than 18 months post consent, but must start within seven years of consent (as an anticipated condition of the development consent order); and
- Assuming a maximum construction period per project of six years, and taking the above into account, the maximum construction period over which the construction of Dogger Bank Teesside A & B could take place is 11 years and six months.

[5] As described in **Chapter 5** the term 'Rochdale Envelope' refers to case law (R.V. Rochdale MBC Ex Part C Tew 1999 "the Rochdale case"). The 'Rochdale Envelope' for a project outlines the realistic worst case scenario or option for each individual impact, so that it can be safely assumed that all lesser options will have less impact.

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5.2.2. To determine which offshore construction scenario is the worst realistic case for a given receptor, two types of effect exist with the potential to cause a maximum level of impact on a given receptor:

- Maximum duration effects; and
- Maximum peak effects.

5.2.3. To ensure that the Rochdale Envelope incorporates all of the possible construction scenarios (as outlined in **Chapter 5**), both the maximum duration effects and the maximum peak effects have been considered for each receptor. Furthermore, the option to construct each project in isolation is also considered ('Build A in isolation' and 'Build B in isolation'), enabling the assessment to identify any differences between the two projects. The three construction scenarios for Dogger Bank Teesside A & B considered within the assessment of seascape and visual impacts are therefore:

- Build A or Build B in isolation;
- Build A and B concurrently – provides the worst 'peak' impact and maximum working footprint; and
- Build A, followed by a potential gap before B is built (sequential) – provides the worst duration of impact.

5.2.4. Any differences between the two projects, or differences that could result from the manner in which the first and the second projects are built (concurrent or sequential, and the length of any gap) are identified and discussed in the impact assessment section of this chapter (Section 6).

5.2.5. For each potential impact only the worst case construction scenario for two projects is presented, i.e. either concurrent or sequential. The justification for what constitutes the worst case is provided, where necessary, in Section 6.

5.2.6. As such, the construction scenarios presented within the impact assessment are:

- Single project (Dogger Bank Teesside A or Dogger Bank Teesside B in isolation); and
- Two projects – concurrent or sequential (Dogger Bank Teesside A and Dogger Bank Teesside B together).

Landfall Construction

5.2.7. There are three installation alternatives for the exit points for the horizontal directional drilling (HDD):

- On the beach above high-water mark (option 1);
- In the intertidal zone between LW and HW (option 2); and
- Offshore in the sub-tidal zone (option 3).

5.2.8. The worst case for landscape, seascape and visual impacts are likely to arise if options 1 or 2 are used for the exit point of the HDD, as the works would be more visible, and closer to onshore receptors, such as people using the beach for recreation.

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5.2.9. As described in **Chapter 5** of this ES, multiple subsea cables may be used to export the electricity generated by Dogger Bank Teesside A & B, and the landfall works may be completed in phases, with the HDD equipment being present for short durations, and then being removed from the site after each phase. In this event, there may be a gap of up to five years (dictated by the onshore construction programme, see **Chapter 5**) in between construction phases at the landfall. Each period of construction at the landfall will be short term, approximately eight weeks in duration for cliff-top works and up to 8 weeks of intertidal and shallow sub-tidal works. Therefore, for the landfall works the worst case scenario assessed is the installation of the two projects sequentially, with a gap of up to 5 years.

5.2.10. Realistic worst case construction phasing scenarios assumed for the SVIA are summarised in **Table 5.1**.

Table 5.1 Realistic worst case construction scenarios assessed for offshore works

Impact	Realistic worst-case scenario	Rationale
Seascape and visual	*Single project isolation:* • Maximum duration of construction activities: 6 years • Maximum period of landfall HDD and construction activities: up to 24 weeks • Maximum duration of intertidal and shallow sub-tidal works: 8 weeks; • Total number of vessels present offshore during peak construction year: 66 • Maximum width of beach open trenching to bury cables: 10m • Maximum cofferdam dimensions: 15x10mx3m	Represents the maximum ranges provided within Project description for a single project.
Seascape and visual	*Two projects (concurrent):* • Maximum duration of construction activities: 6 years • Maximum period of landfall HDD and construction activities: up to 38 weeks • Maximum duration of intertidal and shallow sub-tidal works: 14 weeks • Total number of vessels present offshore during peak construction year: 132 (66 per project) • Maximum width of beach open trenching to bury cables: 20m • Maximum cofferdam dimensions: 15x10mx3m	Represents the maximum peak i.e. intensity of construction activity
Seascape and visual	*Two projects (sequential):* • Maximum duration of construction activities: 12 years • Maximum period of landfall HDD and construction activities: up to 48 weeks (two discrete periods of 24 weeks per project) • Maximum duration of intertidal and shallow sub-tidal works: two discrete periods of 8 weeks with up to 5 years gap • Total number of vessels present offshore	Represents maximum duration of construction Impacts.

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Impact	Realistic worst-case scenario	Rationale
	during peak construction years: 66 per project at two intervals • Maximum width of beach open trenching to bury cables: 2 x 10m • Maximum cofferdam dimensions: 15x10mx3m	

5.3. Operational realistic worst case

5.3.1. A range of potential wind turbine sizes are being considered by Forewind, ranging in output from 6MW to 10+MW. Maximum wind turbine height and minimum spacing required between turbines varies between these models.

5.3.2. Initial modelling carried out and previous SVIA work undertaken indicated that while larger wind turbines would be visible over greater distances, a denser layout of a greater number of smaller wind turbines may in some instances be considered a worst case.

5.3.3. Therefore, for the purposes of this SVIA, two maximum impact scenarios have been defined, based on the turbine options being considered:

- A 'maximum number and density' scenario, representing the greatest number of turbines, at closest spacing; and
- A 'maximum height' scenario, representing the maximum extent of visual influence.

5.3.4. Indicative layouts for both scenarios are based on the parameters defined in **Chapter 5** of this ES, the Wind Farm Layout Rules. The maximum height scenario (10+MW model with 120 turbine positions per project) and maximum density scenario (6MW model with 200 wind turbine positions per project) are shown on **Figures 5.1** and **5.2**. In the event that a 6MW wind turbine is chosen, an array based on wind turbines positioned at the minimum spacing of 750m within the total development area would require a greater number of wind turbines than the maximum number (200) that could be constructed in this scenario. The layout for this scenario is, therefore, based on the maximum density at the outer perimeter of the development area, and a lower density within the centre of the area, in order to allow for variations in detailed layout design.

5.3.5. The impacts resulting in the maximum height scenario, in which a wind turbine size of 10+MW is used, and the maximum density scenario, in which a wind turbine size of 6MW is used, are assessed for a single project (either Dogger Bank Teesside A or Dogger Bank Teesside B) and both projects operating together.

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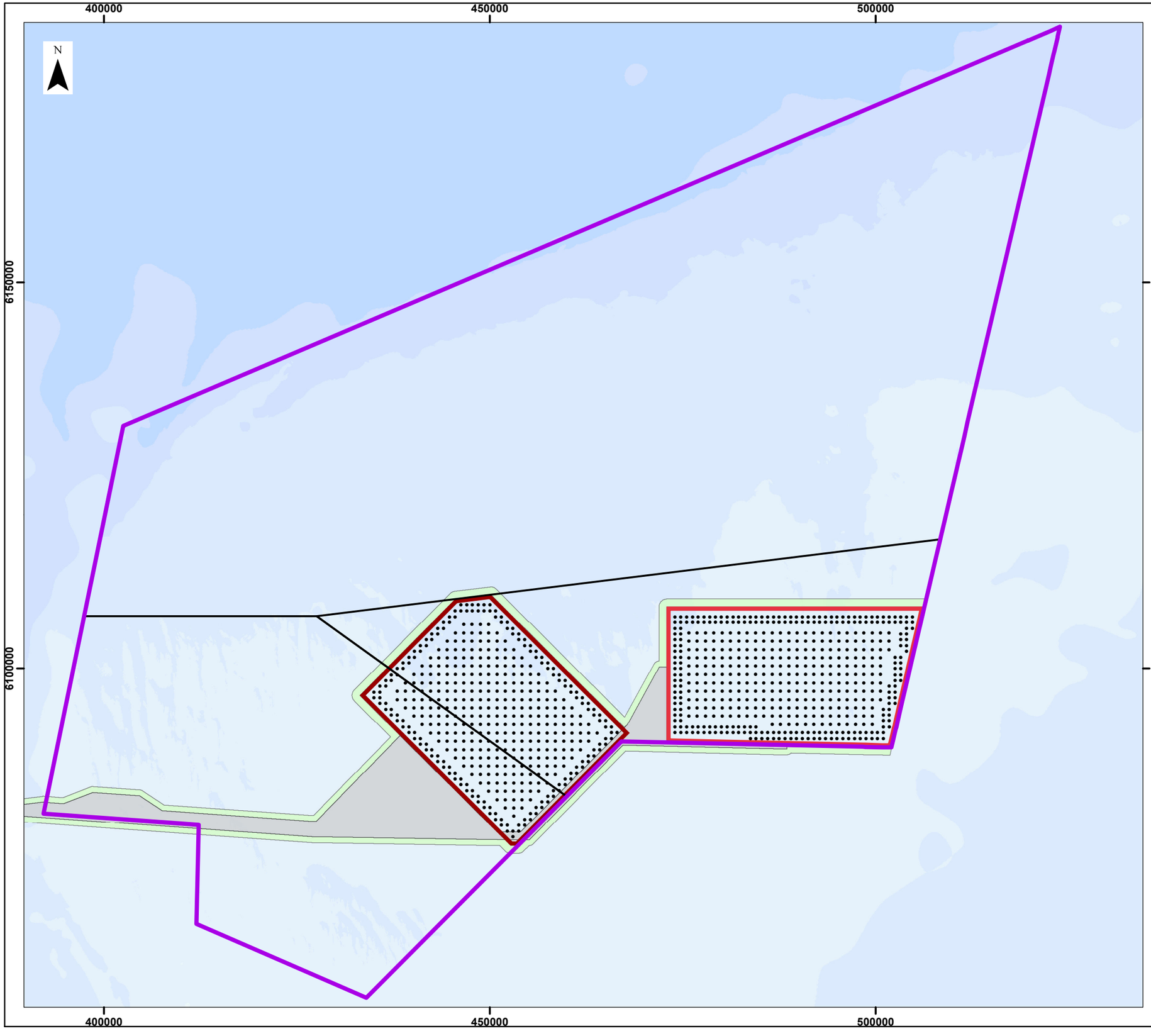

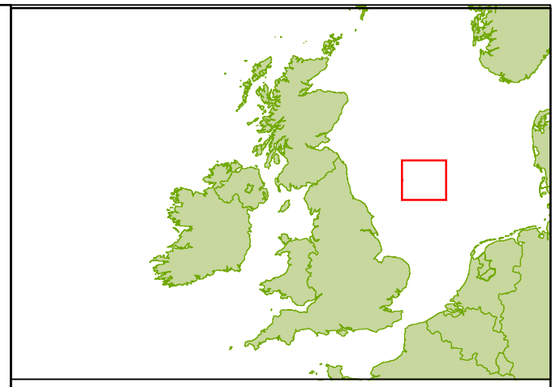

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Minimum turbine spacing (inner 1080m/outer 750m)

0 10 20

Kilometres

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 5.1 Indicative worst case scenario- maximum density for 6MW turbines

VER	DATE	REMARKS	Drawn	Checked
1	10/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-408

SCALE	1:500,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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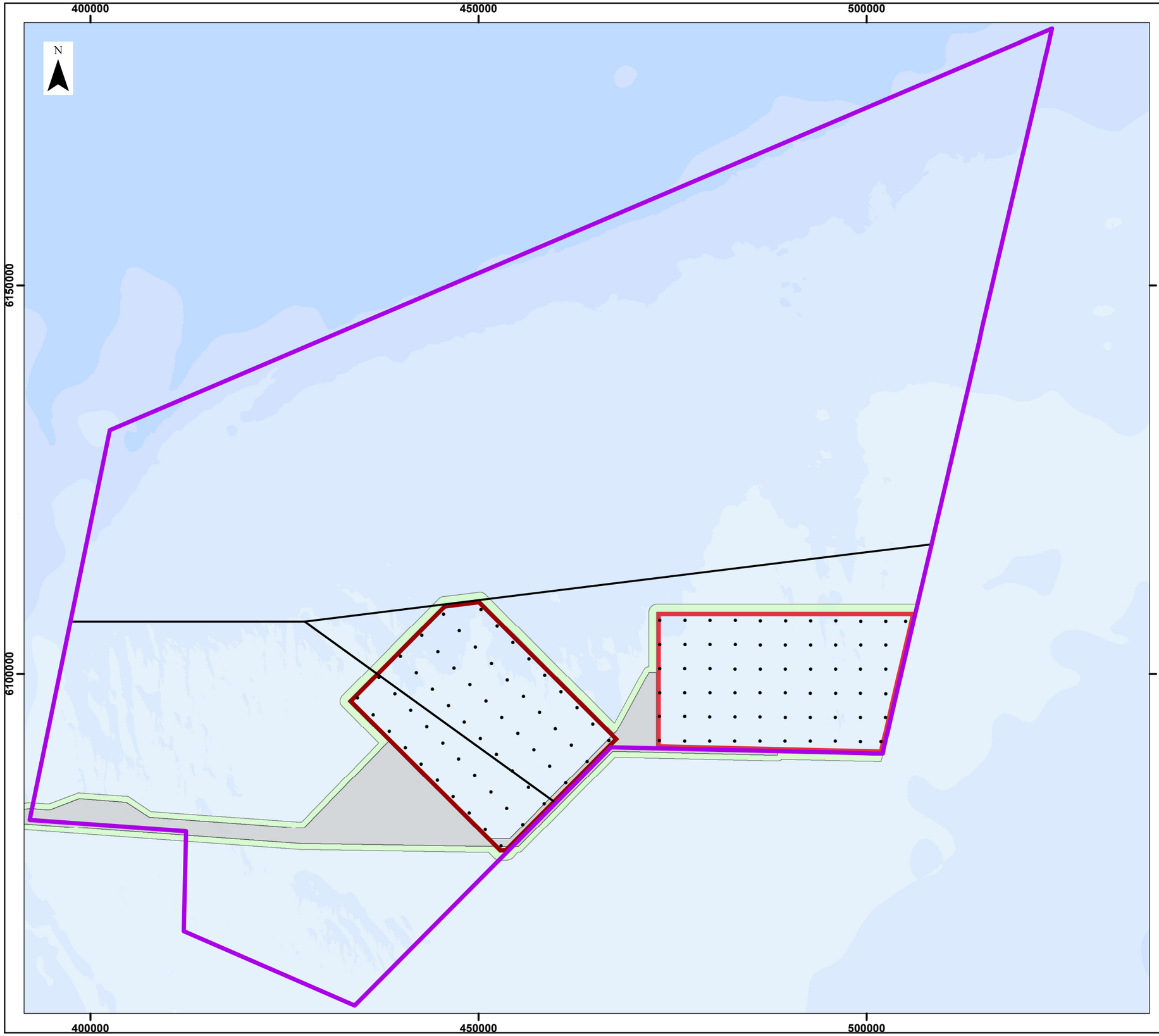

LEGEND

- Dogger Bank Zone
- Tranche boundary
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside A & B Export Cable Corridor
- Temporary works area
- Turbine layout (max 120 turbines)

0 10 20

Kilometres

Data Source:
Seascape data © LUC, 2013
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Background bathymetry image derived in part from TCarta data © 2009

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 5.2 Indicative worst case scenario- maximum height for 10+MW turbines

VER	DATE	REMARKS	Drawn	Checked
1	10/10/2013	PEI3	JE	RZ
2	10/02/2014	DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-409

SCALE	1:500,000	PLOT SIZE	A3	DATUM	WGS84	PROJECTION	UTM31N

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5.3.6. Other features of the operating wind farm are relevant to the assessment:

- The wind turbines will be painted a pale grey colour;
- Navigation lighting will be required on at least some of the wind turbines, as detailed in **Chapter 16** of this ES. Navigation lights are likely to be mounted on the corner turbines, with intermediate lights of nominal range 5nm (8.5km). These nominal ranges represent the minimum required visibility, but the upper limit of visibility depends on a range of factors, and cannot be precisely determined. It is, therefore, assumed that lighting will be visible from any location where visibility of the tower would be expected. This has been considered in the assessment of impacts on views; and
- Aviation lighting will be required on some of the turbines. Aviation lighting is expected to be in the form of directional 'uplighting' and may be infrared, in which case it would not be visible. Directional uplighting would not be visible to observers within close range on the sea surface, but would be seen from further away in the event that infrared lighting is not used. Aviation lighting is not discussed further in this chapter, but is described in **Chapter 19 Military Activities and Civil Aviation** of this ES.

5.3.7. The assessment of operational impacts is based on the realistic worst case scenarios, as defined in **Table 5.2**.

Table 5.2 Realistic worst case operational scenarios assessed

Impact	Realistic worst-case scenario	Rationale
Seascape	*Single project with 6MW turbine size (maximum number and density scenario):* • Maximum number of wind turbines installed: 200 • Maximum tip height above HAT: 267m • Maximum rotor diameter: 167m • Minimum wind turbine spacing: 750m • Maximum number of collector platforms: 4 • Indicative platform topside height of converter platforms: above HAT 65m (including crane 85m): • Maximum number of converter platforms: 1 • Maximum number meteorological masts: 5 • Accommodation/helicopter platforms: 2 • Maximum number of mooring buoys: 10	Represents the 'worst case' number and density scenario, based on the maximum ranges for the 6MW turbine type provided within Project description, for a single project.
Visual	*Single project with 10+MW turbine size (maximum extent of visibility scenario):* • Maximum number of wind turbines installed: 120m • Maximum tip height above HAT: 315m • Maximum rotor diameter: 215m • Minimum wind turbine spacing: 1,080m • Maximum number of collector platforms: 4 • Indicative platform topside height of converter platforms: above HAT 65m (including crane 85m) • Maximum number of converter platforms: 1	Represents the 'worst case' scenario in terms of the distances over which turbines will be visible, based on the maximum ranges for the 10+MW turbine type provided within Project description, for a single project.

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Impact	Realistic worst-case scenario	Rationale
	• Maximum number meteorological masts: 5 • Accommodation/helicopter platforms: 2 • Maximum number of mooring buoys: 10	
Seascape	*Dogger Bank Teesside A & B operational with 6MW turbine size (maximum number and density scenario):* • Maximum number of wind turbines installed: 400 • Maximum tip height above HAT: 267m • Maximum rotor diameter: 167m • Minimum wind turbine spacing: 750m • Maximum number of collector platforms: 4 • Indicative platform topside height of converter platforms: above HAT 65m (including crane 85m) • Maximum number of converter platforms: 1 • Maximum number meteorological masts: 5 • Accommodation/helicopter platforms: 4 • Maximum number of mooring buoys: 20	Represents the 'worst case' number and density scenario, based on the maximum ranges for the 6MW turbine type provided within Project description, for Dogger Bank Teesside A & B operating together.
Visual	*Dogger Bank Teesside A & B operational with 10+MW turbine size (maximum extent of visibility scenario):* • Maximum number of wind turbines installed: 240 • Maximum tip height above HAT: 315m • Maximum rotor diameter: 215m • Minimum wind turbine spacing: 1,080m • Maximum number of collector platforms: 2x4 • Indicative platform topside height of converter platforms: above HAT 65m (including crane 85m) • Maximum number of converter platforms: 2x1 • Maximum number meteorological masts: 2x5 • Accommodation/helicopter platforms: 4 • Maximum number of mooring buoys: 20	Represents the 'worst case' scenario in terms of the distances over which turbines will be visible, based on the maximum ranges for the 10+MW turbine type provided within Project description, for both Dogger Bank Teesside A & B operating together.

5.4. Decommissioning scenarios

5.4.1. **Chapter 5** of this ES provides details of the decommissioning scenarios for Dogger Bank Teesside A & B. Exact decommissioning arrangements will be detailed in a Decommissioning Plan (which will be drawn up and agreed with DECC prior to construction); however, for the purpose of this assessment it is assumed that decommissioning of Dogger Bank Teesside A and Dogger Bank Teesside B could be conducted separately, or at the same time.

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6. Assessment of Impacts – during Construction

6.1. Introduction

6.1.1. This assessment is based upon the construction programme contained in **Chapter 5** of the ES.

6.1.2. The assessment of impacts arising from the construction of the offshore wind turbines, ancillary structures and offshore export cable systems considers three 'worst case' (maximum effect) construction scenarios, as described in Section 5, as:

- Construction Scenario I: Single project;
- Construction Scenario II: Build Projects A and B concurrently - worst case 'peak' effect; and
- Construction Scenario III: Build Projects A and B sequentially - worst case 'duration' of effect.

6.1.3. During the construction period, a number of activities will take place in the development area, as described in **Chapter 5** of the ES. Impacts on seascape and views may arise as a result of the following construction activities:

- Movement of boats, cranes and other equipment visible at the landfall, and along the offshore Export Cable Corridor; and
- Views of offshore wind turbines and other structures under construction in and around the wind farm development area.

6.1.4. Construction activities may affect seascape character and views, across areas from where they will be seen. The extent of visibility of the development will increase as construction progresses and more wind turbines are erected.

6.2. Mitigation

6.2.1. Construction activities will be temporary in nature and mitigation measures to reduce impacts upon the landscape/seascape at the landfall and on views, during the works to install undersea structures, are not considered to be practical or required. Wider mitigation measures, for example in terms pollution avoidance, will in themselves also reduce seascape and visual impacts. The assessment, therefore, identifies and presents impacts taking account of general environmental mitigation proposed in other chapters, but without proposed additional mitigation.

6.3. Construction impacts

6.3.1. As outlined in Section 3 of this report, seascape and visual assessments are separate but interlinked processes. Impacts are described on the basis of the sensitivity of the receptor (seascape or viewer) and the nature and magnitude of the change to that receptor (including, when relevant, reference to them being

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long or short-term, intermittent or continuous, direct or indirect, widespread or localised etc.). The variables are all considered and brought together in order to make a judgement as to the overall level of each impact.

Landfall and inshore area

Direct and indirect impacts on seascape character and resources

6.3.2. At the landfall, the presence of onshore construction vehicles, HDD work, cofferdams (up to 10m wide and 15m long) and beach open trenching will give rise to temporary direct and indirect impacts on the seascape character of the coast.

6.3.3. The construction works will not alter the profile of the dune system and on completion of the works, all temporary structures will be removed and the profile of the beach re-instated. The use of HDD will avoid direct impacts on cliff features and the beach, and, therefore, any long-term impacts on coastal features at the landfall. Sensitive features, such as the rock outcrops and the large cliffs within the south of the study area will be unaffected.

6.3.4. Impacts on seascape character will result primarily from the visibility of barges and other construction vessels within the inshore waters and the presence of machinery from the wider area inland, between Marske-by-the-Sea and Redcar. The duration and intensity of activities will vary slightly according to the construction phasing adopted, but the nature of the activities will be the same. Overall it is not considered that the magnitude of change will be discernibly different between the different scenarios. Change will be temporary and short term in nature, of a medium magnitude for a short duration and reducing to negligible post-construction.

6.3.5. Views of large cargo vessels, tankers and a variety of other vessels are characteristic of the inshore areas within the vicinity of the Tees estuary, due to the presence of large scale port and dock facilities at Teesside. Although the scale and type of vessels that are likely to be used in construction will be of a different type to those typically present in this area, activity will be locally concentrated, and from onshore locations, seen in the context of larger commercial shipping activity. Indirect impacts on the seascape character of the wider unit will diminish with distance from the landfall and cable route.

6.3.6. A summary of impacts arising in all construction phasing scenarios is provided in **Table 6.1**.

6.3.7. Overall, the works associated with the construction activities at the landfall and the installation of the offshore export cable in all construction phasing scenarios is judged to result in a low magnitude of change on the seascape character of the unit. The level of impact overall will be **minor adverse**.

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Table 6.1 Impacts on seascape character of the landfall and inshore area

Criteria	Level of impact (Scenario I, II, III)
Scale and openness Medium scale, predominantly open. Mostly with wide views available along the coast and to the sea, with some areas more enclosed.	This is a medium scale, varied coastline with greater complexity to the south. The temporary works at the landfall will increase the presence of activity, light and perception of a modified coastal edge within a localised area on the beach between Marske-by-the-Sea and Redcar. This will however be set within the context of a highly modified coastline to the northwest at Redcar. At this scale and given the temporary, short term and reversible nature of the landfall works, construction activities will not affect the overall profile or pattern of this stretch of coast line, nor will Warsett Hill be affected as a key focal point. Views of large scale tankers and cargo ships are common place in the inshore areas. Although the scale and type of vessels that are likely to be used in construction will be of a different type to those typically present in this area, activity will be locally concentrated. Increased movement associated with the installation of the export cables will result in short-term, indirect impacts, in the context of existing activity within the inshore waters associated with the high volume of activity within Tees Bay. The construction works will give rise to changes be discernible across the seascape, but these will be short term and reversible. The magnitude of change within the seascape unit will be of a medium level overall during the period of construction, reducing to negligible post-construction. The level of impact will be **minor adverse** overall.
Form Flat to gently undulating in the north, with narrow beaches, rock outcrops and modified coastal edge at the edges of Redcar and Hartlepool. More complex composition to the south, with high cliffs	
Modifications/ Remoteness/ Sense of Naturalness Strong influence of large scale oil and chemical complexes, Teesport and other infrastructure particularly across the north of this seascape, with influence extending to the south of the area. Rock outcrops are present within the immediate inshore waters, and rugged cliffs contribute to a greater sense more naturalness within the south. However, this is predominantly a highly modified and managed coastal edge, with large scale industrial features and settlements present across much of the unit.	
Pattern and foci The pattern is relatively complex, with the coastline comprising partly enclosed stretches of beach along the bays, open elevated cliff tops and promontories where long views are available along the coast. Remnant dunes at Marske and enclosed deans (such as at Saltburn) form local areas where views are more contained. The headland at Warsett Hill forms an important focal point to the south and Hartlepool to the north.	
Lighting The area is extensively lit in the north by the industrial complexes across Teesside and coastal settlements. Within the inshore waters, existing lights present from large vessels.	
Movement There is movement associated with roads that follows close to the shoreline, the offshore wind farm and large vessels moving in and out of the Tees estuary. More natural, irregular, movement is associated with the cliffs to the south	
How experienced The area is experienced from the beaches along the coastline, where focus is on beach activities, as well as footpaths that follow the shoreline. There are also a number of settlements with sea	

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Criteria	Level of impact (Scenario I, II, III)
frontages, parking areas, and several recreational facilities dispersed along the coast. There are elevated positions along the coastline to the south, with views focused across the open sea as well as the expanse of Teesside.	
Aspect The aspect is predominantly to the east, northeast, or southeast. Coastal views are aligned towards the open sea, and the location of potential activities associated with the installation of the offshore cable route.	
Quality/condition The coastal edge is highly developed to the north, with modified edges, large areas of reclaimed and developed land at the Tees estuary. Parts of the hinterland are intensively farmed agricultural land of varying quality. The coastline is also subject to erosion, which in some localised areas, such as at the landfall, gives rise to a more degraded appearance.	

Visual Impacts

6.3.1. Visual impacts arising from construction works landward of MHWS, including the HDD works that will take place within the agricultural fields inland of the A1085 are assessed in detail in the LVIA Technical Report (**Appendix 21A**). The construction works taking place within the intertidal and shallow sub-tidal area, including the movement of machinery, vehicles and vessels, the establishment of cofferdams and beach open trenching will be visible from the beaches extending northwest towards Redcar and southwest towards the edge of Marske-by-the-Sea. However, from areas inland of the mud cliff that back the beach, including from the A1085, views will be more limited due to the slight rise in landform towards the cliff top and the hinterland being relatively flat. Vessel movements within and inshore waters further away from the beach as well as taller machinery will however be visible from the wider area inland, including the edges of Marske-by-the-Sea and Redcar.

6.3.2. Visual change in all three construction phasing scenarios will be temporary and short term in nature, of a high magnitude for a short duration and reducing to none post-construction. The construction works will not alter the profile of the mud cliff and restoration works following open trenching on the beach will mean that there will be no residual visual change to the area post-construction.

6.3.3. The landfall works and laying of the offshore export cables will be discernible to recreational water-based receptors using the inshore waters within and in the vicinity of Tees Bay. These transitory receptors may gain views of the landfall works when passing within ranges of 1-5km[6]. These will be seen as part of the

[6] Limits of visual significance out to sea as discussed in DIT Guidance (DTI, 2005) and Hill M. et al (2001) suggests that at between 3km to 5km from the shore details of the coastline are small and generally

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wider coastal edge, which is already highly influenced by development. Visual impacts will be temporary, of a short duration and of a medium magnitude, reducing to none post-construction.

6.3.4. A summary of visual impacts arising in relation to specific visual receptors is provided in **Table 6.2**.

Table 6.2 Residual visual impacts at the landfall and inshore waters during construction

Receptor	Type, sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact (Scenario I, II, III)
Bydale Howle, Marske Sands	R, T Medium	Close range views of the landfall works on the beach and within the intertidal waters will be available from this location. The construction works will be clearly visible in the view and form an important element of views directed to the northeast out to sea and along the coast to Redcar. The change in view will be short term and reversible. The magnitude of change will be **high** during periods of construction, reducing to **negligible** post-construction.	**Moderate adverse** reducing to **none** post-construction
Millclose Howle, Redcar Sands	H, R, T Medium	Clear views of the landfall works on the beach and within the intertidal waters will be available in views along the coast to the southeast from this location. The construction works will be visible in the middle distance, forming part of the foreground to the edge of Marske-by-the-Sea and the Warsett Hill and cliffs in the distance beyond. The change in view will be short term and reversible. The magnitude of change will be **high** during periods of construction, reducing to **negligible** post-construction.	**Moderate adverse** reducing to **none** post-construction
Valley Gardens, Marske Sands	H, R High	Views of the landfall works on the beach and within the intertidal waters will be available in long views along the coast towards Warsett Hill to the southeast from this	**Minor adverse** reducing to **none** post-construction

indistinct, except for landmarks, such as hills or large built structures. It is therefore that construction works taking place at the landfall will be discernible beyond this distance.

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Receptor	Type, sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact (Scenario I, II, III)
		location. The construction works will be visible, although at some remove, forming part of the foreground to the edge of Marske-by-the-Sea. The change in view will be short term and reversible. The magnitude of change will be **low** during periods of construction, reducing to **negligible** post-construction.	
Church Howle, Marske-by-the-Sea	H, R High	From this location views of the landfall will not be available. Views of vessels along the export cable route will be visible, forming a concentration of activity within the inshore waters for a short duration. Overall the magnitude of change will be **low**, reducing to **none** post-construction.	**Minor adverse** reducing to **none** post-construction
Windy Hill Farm and Windy Hill Lane, Marske-by-the-Sea	H, R High	From this location views of the landfall will not be available. Views of vessels along the export cable route will be visible, forming a concentration of activity within the inshore waters for a short duration. Overall the magnitude of change will be **low**, reducing to **none** post-construction.	**Minor adverse** reducing to **none** post-construction
Saltburn Pier and promenade	H, R High	From this location views of the landfall will not be available. Views of vessels along the export cable route will be visible, forming a concentration of activity within the inshore waters for a short duration. Overall the magnitude of change will be **negligible**, reducing to **none** post-construction.	**Negligible** reducing to **none** post-construction
Zetland Park, Redcar Sands	H, R Medium	Open views from properties fronting Redcar Sands and recreational receptors at Zetland Park are available along the coast, although views to the beaches at Marske Sands beach are largely obscured by the low cliffs backing the beach. From lower-lying areas of Redcar beach, views will be	**Minor adverse** reducing to **none** post-construction

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Receptor	Type, sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact (Scenario I, II, III)
		available to the intertidal and sub-tidal works, giving rise to a change in view of a **low** magnitude at this distance.	
Warsett Hill	R Medium	Panoramic, long distance views are available from this location, with views focused out to sea. Activities at the landfall during construction and along the export cable route will be visible, but given the highly developed nature of the adjacent landscape will not form a noticeable or distinct feature. The change in view will be **negligible** during the construction period, reducing to **none** post-construction.	**Negligible** reducing to **none** post-construction
Sailing vessels	R Low	The landfall works and laying of the offshore export cable will be visible to recreational water-based receptors up to approximately 3-5km from the landfall. Guidance (DTI, 2006) indicates that at this distance the details of the coast line become small and indistinct and therefore the works will be barely discernible. Along the export route there will be a concentration of additional vessel movement. The works will be seen as part of the wider developed coastal edge and highly industrialised hinterland of Teesside. Visual impacts will be temporary, of a short duration, and of a **low** magnitude.	**Minor adverse** reducing to **none** post-construction

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Impacts on historic seascape character

6.3.5. In the inshore area, effects on surface historic seascape character will be highly transitory and will be confined to the period of cable-laying operations.

6.3.6. Other than the direct visual effects of the presence of large cable-laying vessels close to shore, potentially disrupting normal patterns of maritime traffic, the potential of the development to affect surface historic seascape character is limited. No significant effects on surface historic seascape character are predicted at either the whole sub-type level or more locally as a result of construction activities. The temporary presence of construction vessels during the construction phase will have no effect on the ability to perceive, understand or appreciate either current or past historic seascape character.

6.3.7. The level of effect is therefore judged to be **negligible**.

Dogger Bank Teesside A & B Export Cable Corridor

Impacts on seascape character

6.3.8. Temporary, short-term impacts will arise from the increased activity along the Dogger Bank Teesside A & B Export Cable Corridor. The magnitude of change will be barely perceptible and the impact on seascape character will be **negligible** overall.

Visual impacts

6.3.9. The visual receptors identified within the study area are transitory, and include predominantly cargo ships, tankers, and fishing vessels, which are of low sensitivity.

6.3.10. RYA data indicates the route is crossed by four medium use cruising routes, the passengers upon which will be of medium sensitivity to this type of change.

6.3.11. In all construction phasing scenarios, there is not likely to be a notable change in views experienced by these receptors. Limited change will arise due to the increased number of vessels and activity within the area occurring in the context of existing dispersed industrial structures and activities and shipping. The magnitude of change will be barely perceptible and the impacts **negligible**.

Historic seascape character

6.3.12. Effects on surface historic seascape character in the Dogger Bank Teesside A & B Export Cable Corridor will be temporary and will be perceptible to a limited range of receptors. Effects will be limited to the presence of cable-laying vessels and perceptible changes in marine traffic in the duration of cable installation. Effects on surface historic seascape character will be **negligible** during the construction phase.

Dogger Bank Teesside A & B development area

Direct and indirect impacts on seascape character

6.3.13. The visibility of partially completed wind turbines, accommodation platforms, collector substations and other ancillary infrastructure, will not exceed the visibility of the operational scheme. The potential for impacts will increase

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incrementally over the construction period, and be similar to those for operational impacts.

6.3.14. The pattern of impacts would be largely the same for construction activities as for operational activities, in all three construction phasing scenarios. There are likely to be significant impacts (**moderate adverse**) arising from views of the wind farm under construction, which will give rise to direct and indirect impacts on the seascape character. Impacts will be temporary in nature, of medium term duration of up to six years in Scenarios I and II and up to 11.5 years for Scenario III.

6.3.15. A summary of impacts on seascape character during construction is provided in **Table 6.3**.

Table 6.3 Summary of level of impact during construction

Criteria	Level of impact (scenario I, II, III)
Scale and openness Vast scale area of open sea, with open views.	The area is extensive, large scale, unified and simple in composition. It is judged to be of low sensitivity. Construction activities, including the movement of vessels, cranes and lighting will alter the perception of an extensive area largely undeveloped to one undergoing substantial modification. Perceptual qualities, particularly remoteness from direct human influences will be considerably affected during the construction of the scheme. The overall magnitude of change to the character of the study area is considered to be **high**. The level of impact is considered to be **moderate adverse**.
Form Simple, unified.	
Modifications/ Remoteness/ Sense of Naturalness Largely undeveloped seascape, with a high level of apparent naturalness. There is some surface infrastructure present within the outer extents of the study area to the south, associated with oil and gas extraction, although this is limited across the remainder of the development areas.	
Pattern and foci Simple pattern and almost entirely lacking in elements or focal points that would allow a sense of orientation or location.	
Lighting The area is largely unlit at night, with some limited impacts of lights from sea traffic.	
Movement Movement across the area is highly natural. There are higher levels of fishing activity concentrated in the northern extent of Dogger Bank Teesside A and large commercial vessels pass through parts of the area at relatively frequent intervals.	
Quality/condition The area, as discernible at surface level, is largely intact, with few permanent man-made structures and limited influence from oil and gas extraction operations.	

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Visual impacts

6.3.16. Receptors are predominantly transitory, including shipping, recreational vessels and fishing vessels, and are of medium to low sensitivity. Visual impacts resulting from the visibility of partially completed wind turbines, accommodation platforms, collector substations and Met masts will be of a similar nature but generally of a lower magnitude to those reported for the construction phase. Impacts on visual receptors are, therefore, as those reported in Section 7 of this report.

Historic seascape character

6.3.17. The construction of the proposed wind farm will result in a high magnitude of relatively local changes to surface historic seascape character, especially when this is considered in the wider context of the North Sea. The typology of the entire hierarchy from sub-seabed to surface will be changed within the development footprint, from the current sub-type to a 'renewable energy installation.' These sub-types are generally of low sensitivity. The extent and totality of the change will be of high magnitude. However, the heritage values of these receptors are relatively limited.

6.3.18. Overall, in the context of the affected HSC sub-types, the impacts are judged to be **minor adverse** in relation to the wider surface historic seascape character of the study area and with reference to the heritage value of the affected areas. For direct physical effects on marine heritage assets, and the HSC of the water column, seabed and sub-seabed see **Chapter 18** of this ES.

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7. Assessment of Impacts – during Operation

7.1. Introduction

7.1.1. This assessment considers the impacts during the operation of Dogger Bank Teesside A & B. The assessment of seascape and visual impacts during operation of the landfall and offshore Dogger Bank Teesside A & B Export Cable Corridor is not considered, as the subsea cable will not be discernible once installation is complete.

7.1.2. Operational impacts will continue for the life span of the wind farm. Dogger Bank Teesside A and Dogger Bank Teesside B may be in situ for up to 50 years, although it is assumed that replanting will be necessary at the end of its design life of 20 to 30 years. Replanting would be subject to a separate consent and SLVIA process and is, therefore, not considered here.

7.2. Potential impacts

7.2.1. Long term impacts on seascape and views may arise as a result of 'worst case' scenarios, definitions of which are set out in Section 5. This would result in potential changes to the perception of seascape character, and to the views experienced by different groups that may pass through the study area. There will be direct impacts on an area of open sea, of approximately 560 km^2 and 593km^2 in extent for Dogger Bank Teesside A & B respectively. There will be no direct impacts on the seascape within the wider study area or upon landscape character, at this distance from the shore. Indirect impacts upon seascape character and views will however arise.

7.2.2. Maintenance activities will require regular vessel movements to and from the wind farm. Vessel movements at the wind farm site will contribute to seascape and visual impacts, but will not increase the level of impact over and above that resulting from the wind turbines themselves. Increased boat movements at an onshore base will also result in some seascape and visual impacts. At present, the location of the onshore base, and the extent of vessel movements, is undetermined. Increases in vessel movements would be seen in the context of existing port activity, and as such are unlikely to result in any significant impacts.

7.3. Mitigation

7.3.1. Traditional methods of landscape and visual mitigation, such as planting vegetation, are ineffective, impractical or not necessary for offshore wind farm development. Mitigation for wind farms is generally limited to the reduction of potential direct impacts through detailed siting, and the reduction in adverse aesthetic impacts through wind farm design, as well as the design and detailing of ancillary infrastructure such as signage and lighting. This is made clear in *Siting and Designing Wind Farms in the Landscape* (SNH 2009).

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7.3.2. The marine horizon is flat and uninterrupted, and all offshore wind farms are seen as rows of turbines. Simple, regular patterns are, therefore, generally preferred (DTI 2005) in contrast to the more organic layouts sought for onshore schemes. Detailed siting of offshore turbines is driven by a range of physical and environmental constraints including localised geological conditions, ecology, aviation, navigation, wind resource, and marine archaeology. As noted by current guidance, it is essential that mitigation of the visual impacts of offshore wind turbines is considered in the context of requirements for the safety of shipping and navigation interests.

7.3.3. Requirements for the marking of offshore wind turbines, so as to be conspicuous by day and night, have the potential to be at odds with recommendations in guidance to minimise turbine visibility for sensitive onshore receptors. However, there are no potential shore-based visual receptors who would experience such impacts. Measures to reduce impacts of lighting on transitory, sea-based visual receptors are not considered practical, or to be required, in this context. Standard measures such as the use of directional uplighting will be adopted, as described in **Chapter 16** of this ES.

7.3.4. The assessment identifies and presents impacts without proposed additional mitigation.

7.4. Operational Impacts

Seascape character

7.4.1. Indirect impacts on the seascape character of the Dogger Bank Teesside A & B area will arise from the presence of the offshore wind turbines, converter stations, accommodation platforms and Met masts in views from potential marine-based receptors, which may affect the perception of the seascape.

7.4.2. Impacts on the seascape character will be long term, and affect key qualities of largely empty open horizon line and remoteness. An extensive area of open sea will be affected. The magnitude of change will be high, affecting a receptor of low sensitivity and, in the local context, a **moderate adverse** level of impact is predicted overall, for all scenarios.

7.4.3. Within the context of the wider North Sea, the impacts will be relatively localised and affect a very small number of receptors.

7.4.4. An assessment of the residual impacts on seascape character, which applies for all scenarios, is presented in **Table 7.1**.

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Table 7.1 Impacts on the seascape character of the development area during construction

Criteria	Magnitude of change and level of impact
Scale and openness Vast scale area of open sea, with open views.	This area is extensive, large scale and simple in composition of low sensitivity. Perceptual qualities including the lack of development and sense of remoteness from direct human influences will alter notably as a result of the development. The overall magnitude of change to the character of the study area is considered to be high. The level of impact is considered to be **moderate adverse** for all scenarios.
Form Simple, flat and horizontal	
Modifications/ Remoteness/ Sense of Naturalness Largely undeveloped seascape, with a high level of apparent naturalness. A high perceptual degree of remote and isolation. There is some surface infrastructure present to the southwest of the Dogger Bank Teesside A development area associated with oil and gas extraction, although this is limited across the remainder of the development areas.	
Pattern and foci Simple pattern and almost entirely lacking in elements or focal points that would allow a sense of orientation or location.	
Lighting The area is largely unlit at night, with some limited impact of lights from sea traffic.	
Movement Movement across the area is highly natural. There are higher levels of fishing activity concentrated in the northern extent of Dogger Bank Teesside A and passenger ferries and large commercial vessels pass through parts of the area at relatively frequent intervals.	
Quality/condition The area, as discernible at surface level, is almost entirely undeveloped, with few permanent man-made structures and limited influence form oil and gas extraction operations southwest of the Dogger Bank Teesside A development area.	

Visual impacts

7.4.5. RYA data and AIS Radar tracking information recorded during the maritime traffic surveys (see **Chapter 16** of this ES) indicate that recreational vessels may pass intermittently, relatively close to the offshore development area, depending on their precise route.

7.4.6. Indicative wirelines are presented in **Figure 7.1** – **Figure 7.8.** These are based on positions within the development study area along the Medium Use Cruising

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Routes plotted using RYA Cruising Routes (2009), and where these intersect with commercial vessel main routes (see **Chapter 16**) and high fishing vessel activity to the northwest and to the east of Dogger Bank Teesside A & B. The locations are shown on **Figure 4.5**.

7.4.7. Recreational receptors may view the wind turbines, platforms and other ancillary infrastructure as features of interest or a new focal point on their journey as they pass by, and are likely to see the offshore development for a relatively short period of their voyage. The presence of the wind turbines is unlikely to affect the overall experience of receptors travelling across the North Sea.

7.4.8. Meteorological data presented in Section 3 suggests that there will be no visibility beyond approximately 20km for in the order of 46% of the time, suggesting that the wind turbines would not be visible beyond approximately 20km of the outer edges of Dogger Bank Teesside A & B for approximately 167 days per year and that visibility beyond 50km will be limited to approximately 12 days per year.

7.4.9. The magnitude of visual change will be high within areas up to 15-20km from the development area boundary, in clear weather conditions, affecting a relatively low number of transitory visual receptors of medium to low sensitivity. For all scenarios, relatively localised impacts of a **moderate adverse** level are predicted within 20km, with impacts diminishing to a **minor adverse** level beyond 20km

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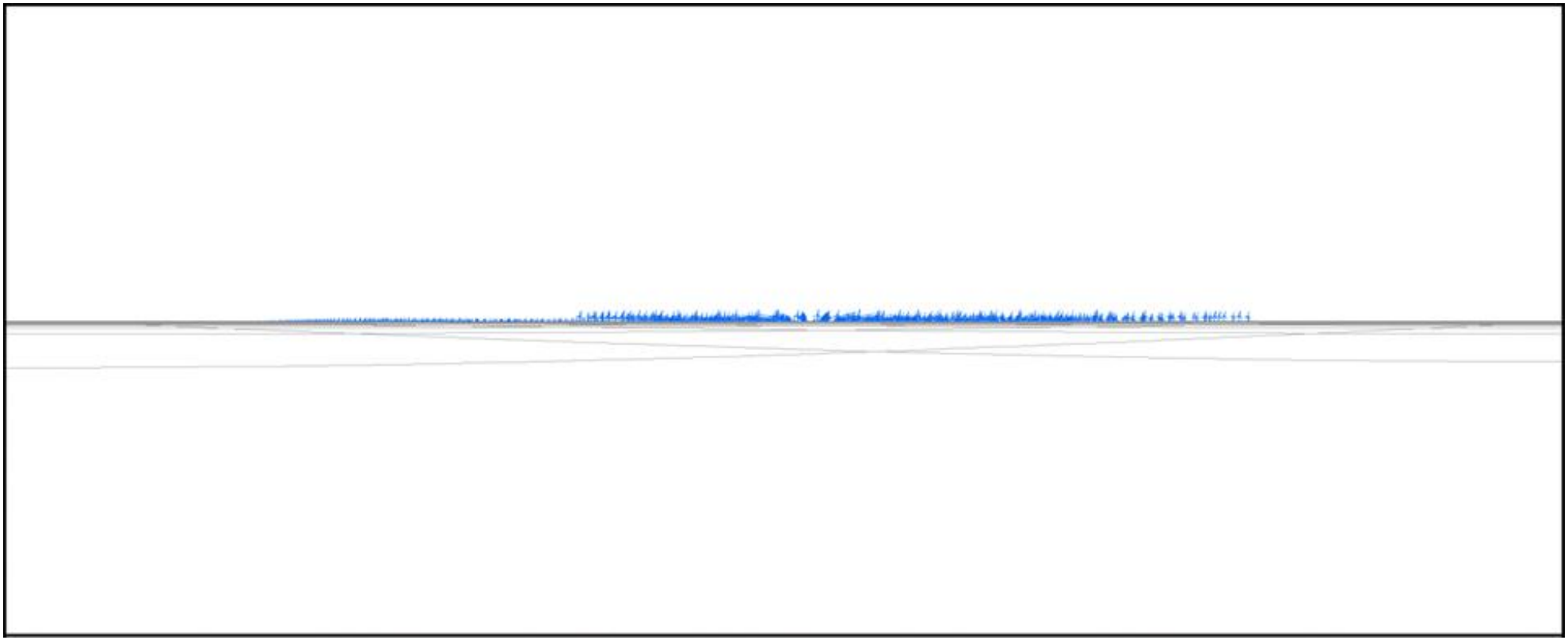

Figure 7.1 Viewpoint 1: Worst Case Scenario - Maximum Density for 6MW Turbines

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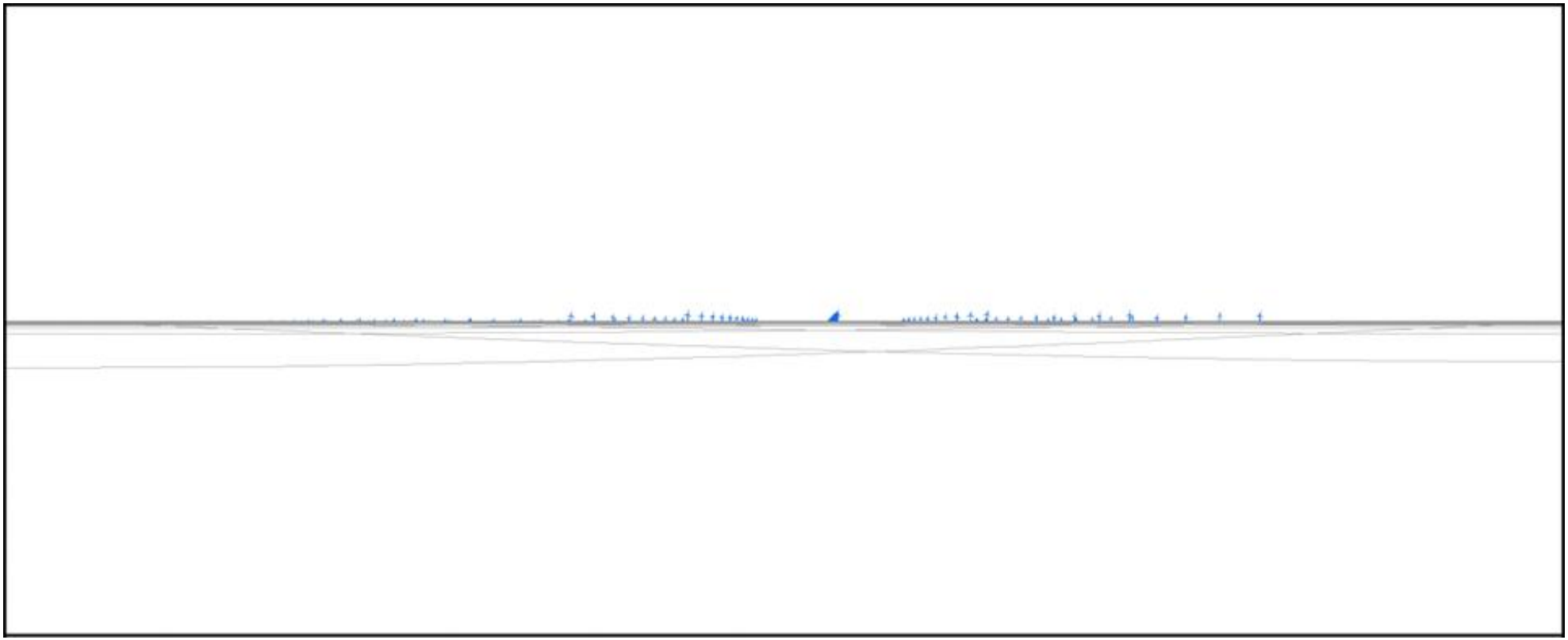

Figure 7.2 Viewpoint 1 Worst Case Scenario - Maximum Height for 10+MW Turbines

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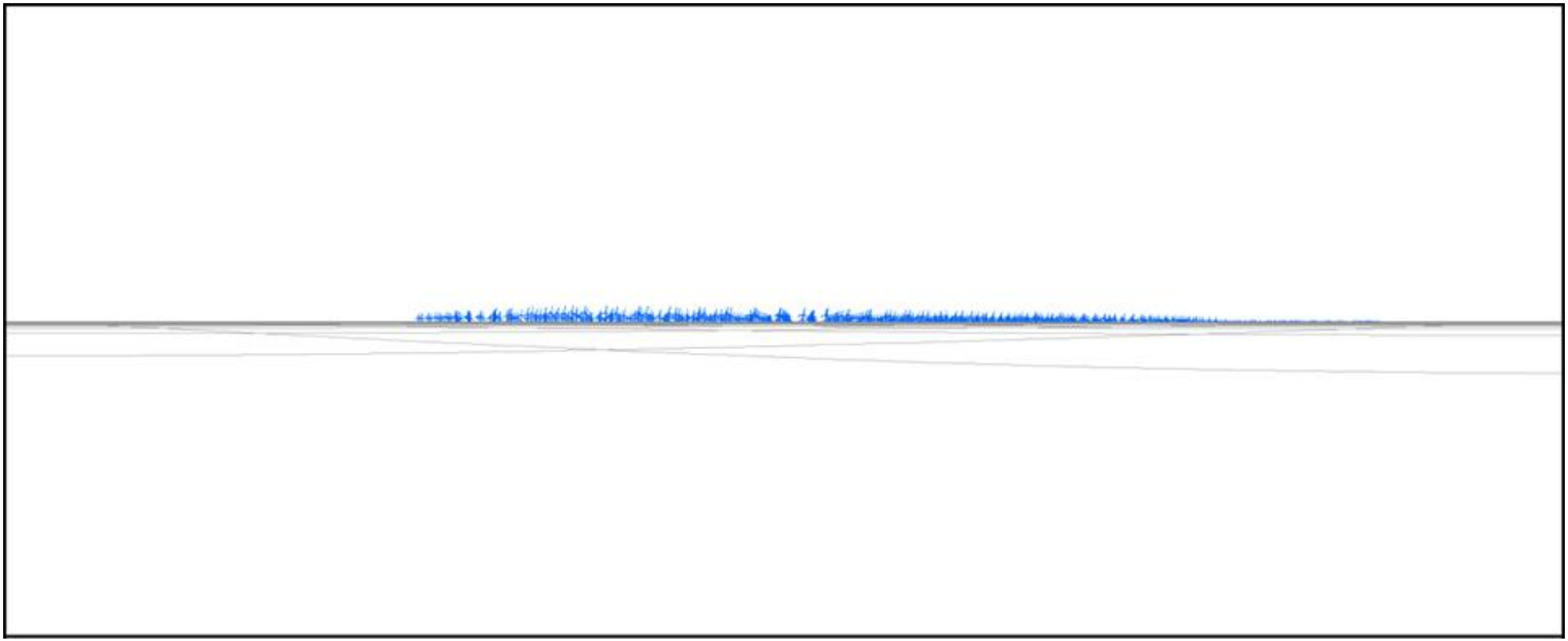

Figure 7.3 Viewpoint 2 Worst Case Scenario - Maximum Density for 6MW Turbines

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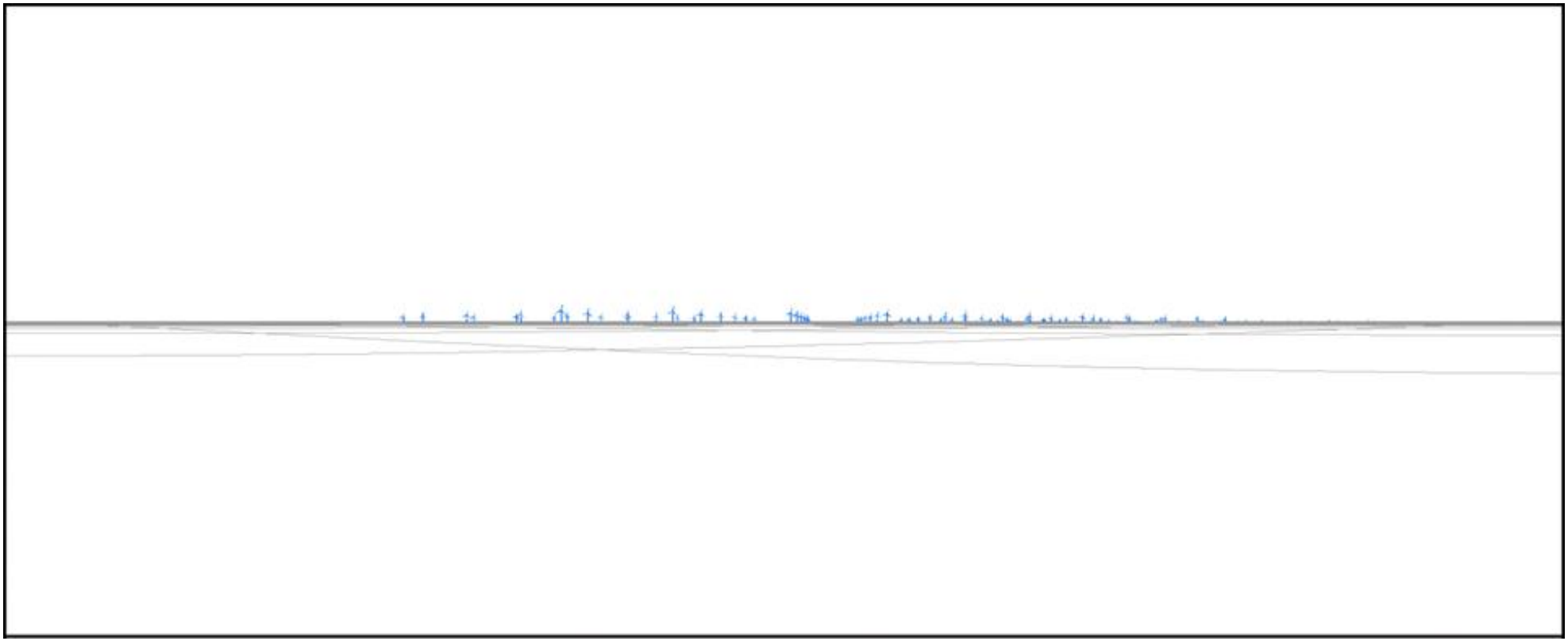

Figure 7.4 Viewpoint 2 Worst Case Scenario - Maximum Height for 10+MW Turbines

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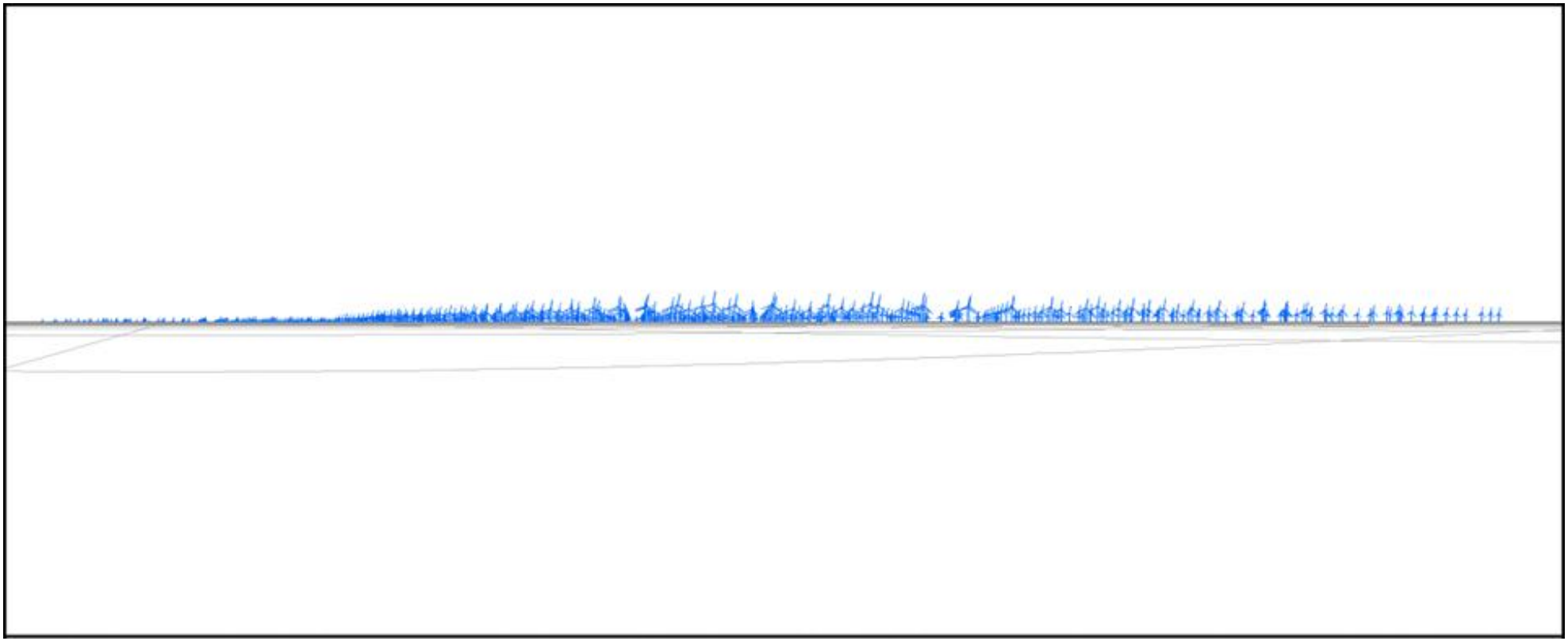

Figure 7.5 Viewpoint 3 Worst Case Scenario - Maximum Density for 6MW Turbines

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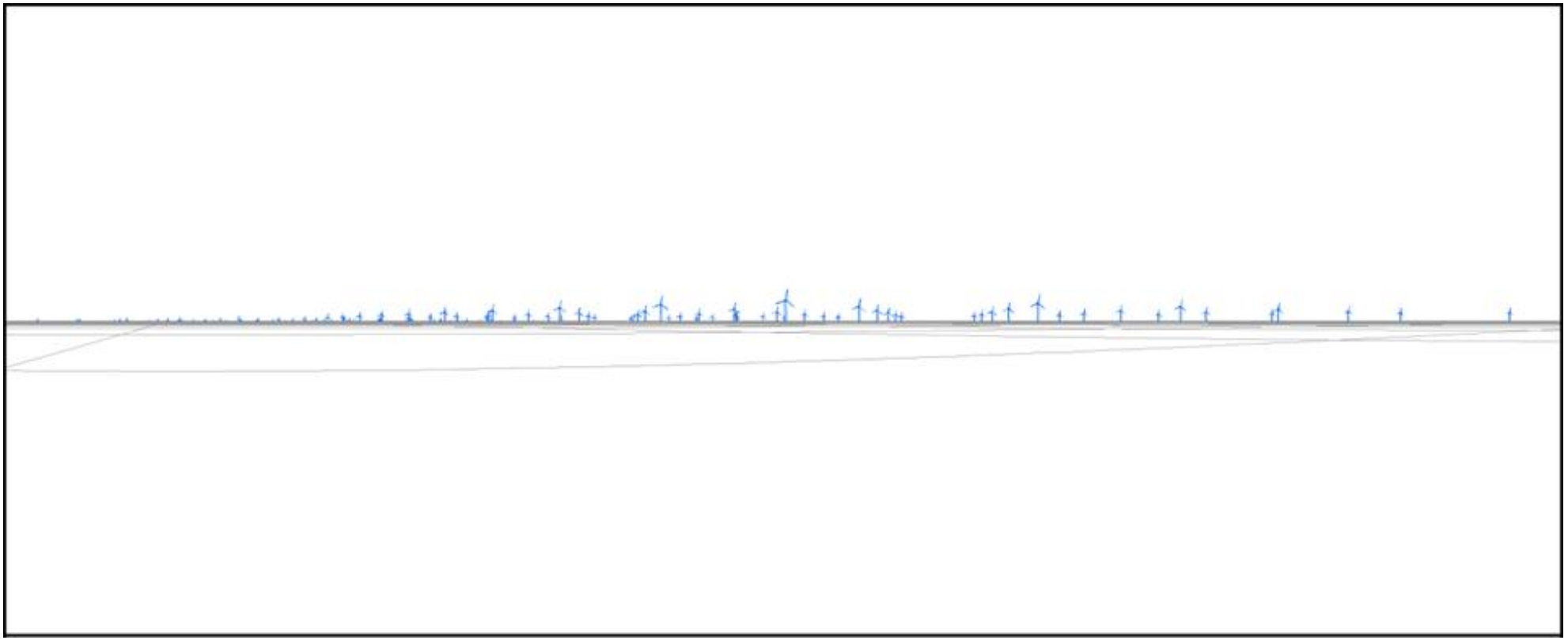

Figure 7.6 Viewpoint 3 Worst Case Scenario - Maximum Height for 10+MW Turbines

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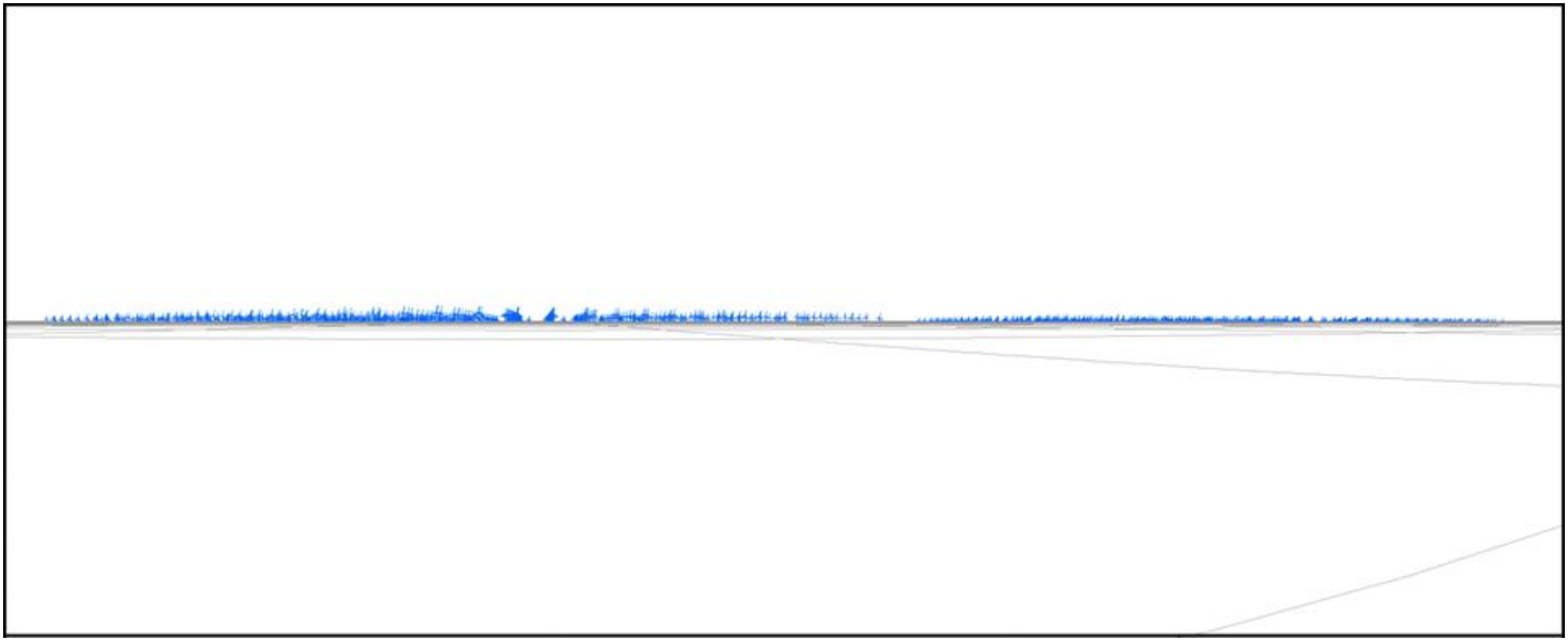

Figure 7.7 Viewpoint 4 Worst Case Scenario - Maximum Density for 6MW Turbines

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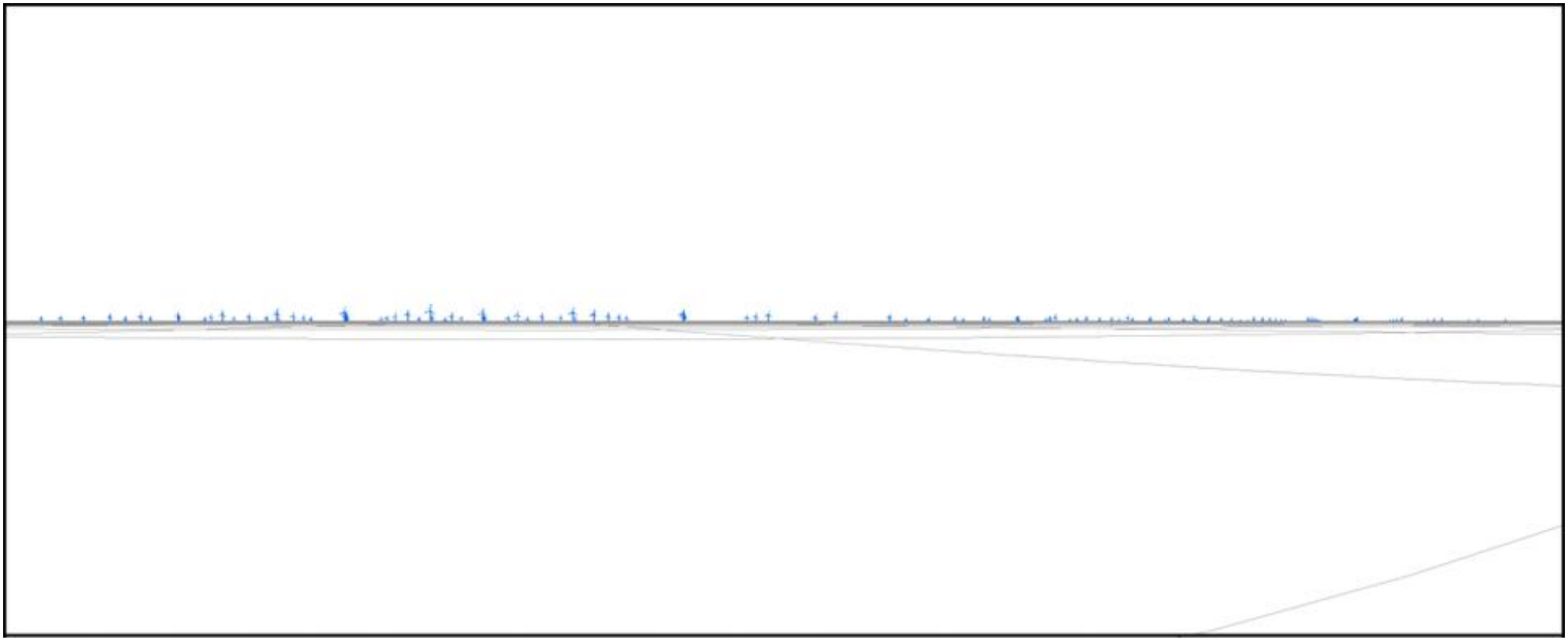

Figure 7.8 Viewpoint 4 Worst Case Scenario - Maximum Height for 10+MW Turbines

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Historic seascape character

7.4.1. The operation of the proposed wind farm will result in a medium magnitude of relatively local changes to surface historic seascape character, especially when this is considered in the wider context of the North Sea. The typology of the hierarchy from sub-seabed to surface will progressively be changed within the development footprint, as turbines are installed, from the current sub-type to a 'renewable energy installation'. These sub-types are generally of low sensitivity. The extent and totality of the change will be of a high magnitude. However, the heritage values of these receptors are limited.

7.4.2. Overall, in the context of the affected HSC sub-types, the impacts are judged to be **minor adverse** in relation to the wider context of the North Sea, and with reference to the heritage value of the affected areas. For direct physical effects on marine heritage assets, and the HSC of the water column, seabed and sub-seabed see **Chapter 18** of this ES.

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8. Assessment of Impacts – during Decommissioning

8.1.1. This section considers the impacts during the decommissioning of the wind farms. The requirements for decommissioning of the cable at the landfall are not known at this time, although it is likely the cables will remain in situ, except for a short section at the landfall. This is assessed within Section 10 of the LVIA Technical Report (**Appendix 21A**).

8.1.2. The decommissioning of the wind turbines, offshore platforms, offshore cabling and other ancillary structures is described in full in **Chapter 5** of this ES. The process of decommissioning these elements is expected to involve the reverse of the installation process and include the dismantling and removal of all surface structures. It is anticipated that the resulting impacts will be of a similar nature but generally of a lower magnitude to those reported for the construction phase. Impacts on seascape and views, and on historic seascape character, are therefore the same as those reported in Section 6.

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9. Inter-relationships

9.1. Introduction

9.1.1. In order to address the environmental impacts as a whole, this section highlights the potential inter-relationships between seascape and visual receptors and other physical, environmental and human receptors.

9.1.2. Potential for inter-related impacts are predominantly associated with the linkages between impacts on the seascape and views with those associated with:

- Onshore works for Dogger Bank Teesside A & B during construction;
- Marine archaeology and the historic environment; and
- Tourism and recreational interests.

9.1.3. The EIA highlights these potential inter-relationships to ensure that a holistic account of all potential interactions on any one receptor are captured and understood. For example:

- Impacts upon views may be experienced by recreational users, which may affect tourism and socio-economics;
- The presence of development might affect the setting of historic resources or activities and uses historically linked to particular marine areas;
- Changes can affect the perception and appreciation of landscape character at the coastal edge, where there are views to the sea; and
- Changes to coastal processes and the physical composition of the coast can affect the character of the seascape.

9.1.4. **Table 9.1** summarises the potential inter-relationships that are considered of relevance to landscape and visual receptors and identifies where they have been considered within the ES.

Table 9.1 Inter-relationships relevant to the assessment of seascape impacts

Inter-relationship	Section where addressed	Linked chapter
All phases		
Land-based recreational receptors using Public Rights of Way (PRoW) and related impacts on recreation and tourism on land	Section 6 and 7	**Chapter 23 Tourism and Recreation**
Water-based recreational receptors using the intertidal and offshore area.	Section 6 and 7	**Chapter 23 Tourism and Recreation**

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Inter-relationship	Section where addressed	Linked chapter
All phases		
Impacts on receptors of ecological value	Section 6 and 7	**Chapter 12 Marine and Intertidal Ecology**
Impacts on sea-based visual receptors, fishing vessels and shipping vessels	Section 6 and 7	**Chapter 15 Commercial Fisheries,** **Chapter 16 Shipping and Navigation** **Chapter 17 Other Marine Users**
Impacts on physical processes	Section 6 and 7	**Chapter 9 Marine Physical Processes**
Impacts on landscape character	Section 6 and 7	**Chapter 21 Landscape and Visual Impact Assessment**

9.2. Combined impacts on landscape character and visual receptors

Onshore and offshore works during construction

Landscape character

9.2.1. The offshore and onshore works will coincide at the landfall for the relatively short period of the landfall works, which may be up to 24 weeks for the onshore HDD works and eight weeks for the beach or inter-tidal works for a single project, as described in Section 6. As such, the combined duration of the works will remain temporary. No long-term impacts are anticipated as all disturbed areas will be reinstated, and no permanent structures will be present at the landfall during the operational phase.

9.2.2. The combined cumulative impacts of the onshore and offshore works will be short-term and reversible, and post-construction overall the level of impact will be **negligible**.

Visual impacts

9.2.3. Offshore construction activities and onshore work as a whole could potentially be on-going in sequence for in the order of eight years for one project. The onshore and offshore works at the landfall and within the inshore waters will not be seen at the same time as the construction of the offshore wind turbines, as the latter will be beyond the visual limit of these areas. Being close together, coincident work in the inshore and intertidal areas and landward section of the HVDC cable route close to the A1085 will be experienced as being part of the same overall project, and may be seen in views from the coastal edge, including the edges of Redcar and Marske-by-the-Sea. Construction works along the onshore HVDC cable route and that of the offshore cabling will be apparent to onshore viewers in combined views. Potentially there may be

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sequential views available of the onshore and offshore works for travelling receptors, such as users of the public rights of way between Redcar and Marske-by-the-Sea, and more elevated areas at the northern edge of the Eston Hills, such as at Errington Wood, as part of the same overall project.

9.2.4. Short term changes in views will be of a high magnitude for close range land-based visual receptors, affecting users of the public rights of ways, beaches, and the A1085 that follows the coastal edge. These will be short term and impacts are predicted to be low overall. Visual receptors present at Marske Sands, the northern edge of Marske-by-the-Sea and the northern edge of Redcar will experience short term change of a medium magnitude, resulting in a **minor adverse** level of impact.

9.2.5. The onshore works at the landfall and the offshore works out to approximately 3-5km from the coast may be visible simultaneously, should the works be undertaken at the same time. This would give rise to short term, localised visual impacts, of a **minor adverse** level.

9.2.6. The combined cumulative impacts of the onshore and offshore works will be short-term and reversible, and post-construction overall the level of impact will be **negligible**.

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10. Cumulative Impact Assessment

10.1. Introduction

Overview and relevant guidance

10.1.1. This section describes the cumulative impacts for seascape and visual receptors, taking into consideration other plans, projects and activities. A summary of the Cumulative Impact Assessment is presented in **Chapter 33** of this ES.

10.1.2. The cumulative impact of a set of developments is described in *Offshore Renewables Guidance on Assessing the Impact on Coastal Landscape and Seascape: Guidance for Scoping an Environmental Statement* (SNH 2012, paragraph 7.1) as:

- 'The combined effect of all the developments, taken together; that is a development with other types of the same development – for example, wind farms and other wind farms; or
- The effect of a development in combination with other, different projects and activities – for example, wind farms in combination with aquaculture, or in combination with oil rigs.'

10.1.3. Although both SLVIA and cumulative seascape and visual impact assessment consider effects on seascape and views, there are differences in the baseline against which the assessments are carried out.

10.1.4. For the SVIA, the baseline includes existing wind farm developments which are present in the landscape at the time of undertaking the assessment, which may be either operational or under construction. Potential impacts arising as a result of the introduction of Dogger Bank Teesside A & B in the context of a baseline consisting of existing developments and schemes under construction (for example Teesside Offshore Wind Farm located to the east of Teesport) have been assessed as part of the SVIA. These schemes are therefore not included in the cumulative assessment.

10.1.5. In the cumulative assessment, the baseline is partially speculative and to some extent uncertain. In accordance with Scottish Natural Heritage's guidance Assessing the Cumulative Impact of Onshore Wind Energy Developments (March 2012) and the GLVIA the assessment will consider the following within the cumulative assessment:

- The addition of Dogger Bank Teesside A & B in the context of consented developments, and submitted planning applications/ schemes at appeal which are currently awaiting determination by the relevant consenting authority

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Approach taken by Forewind

10.1.6. Forewind has developed a strategy for the assessment of cumulative impacts in consultation with statutory stakeholders including the MMO, the Joint Nature Conservation Committee (JNCC), Natural England and the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Details of the approach to the assessment of cumulative impacts which is adopted are provided in **Chapter 4** of the ES. In its simplest form, the Cumulative Impact Assessment assesses:

- Whether impacts on a receptor can occur on a cumulative basis between the wind farm project(s) subject to the application(s) and other wind farm projects, activities and plans in the Dogger Bank Zone (either consented or forthcoming); and
- Whether impacts on a receptor can occur on a cumulative basis with other activities, projects and plans outside the Dogger Bank Zone (e.g. other offshore wind farm developments), for which sufficient information regarding location and scale exist.

Identification of projects

10.1.7. A list of the projects, activities and plans within 100km of Dogger Bank Teesside A & B which are judged to be of relevance to seascape character and views is provided in **Table 10.1.** These are presented together with a screening exercise to establish whether there is sufficient confidence in the data and information to take these forward into the assessment and whether the developments are likely to have visual interaction with the proposed development.

10.1.8. Projects located in excess of 100km from the Dogger Bank Teesside A & B development areas have not been considered within the cumulative assessment. The visual extent of Dogger Bank Teesside A & B is 75km (described in Section 4 of this report). Intervisibility between Dogger Bank Teesside A & B and other surface structures may be possible within this area, however this will diminish with distance from the wind turbines. Taking a precautionary approach, projects up to approximately 100km away from Dogger Bank Teesside A & B have been considered as beyond this distance there is no potential for significant cumulative effects to occur[7].

10.1.9. This process identifies which schemes could potentially result in significant impacts together with Dogger Bank Teesside A & B and is based on a consideration of the following aspects:

- Scale and type of development; and
- Distance from the Dogger Bank Zone, Dogger Bank Teesside A & B Export Cable Corridor and landfall area.

[7] The assessment is focused on projects that have the potential to give rise to significant cumulative effects and therefore does not consider sequential visual effects across the wider study area of the North Sea beyond 100km. It is possible that there may be some sequential views experienced by people travelling across the wider North Sea, but this will not include sensitive receptors (as no passenger ferries or RYA routes pass between the two areas).

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10.1.10. A total of six projects, located within 100km of the development area of Dogger Bank Teesside A & B, were identified as being developments of a scale and within sufficient proximity to give rise to potential impacts. These schemes include consented wind farms, and proposals at application stage, specifically:

- Dogger Bank Creyke Beck A & B (within the Dogger Bank Zone);
- Dogger Bank Teesside C & D (within the Dogger Bank Zone);
- Hornsea Round 3 Zone Project One;
- Hornsea Round 3 Zone Project Two;
- Cygnus A HUB; and
- Cygnus B NPAI.

10.1.11. Locations of these are illustrated in **Figure 10.1** below.

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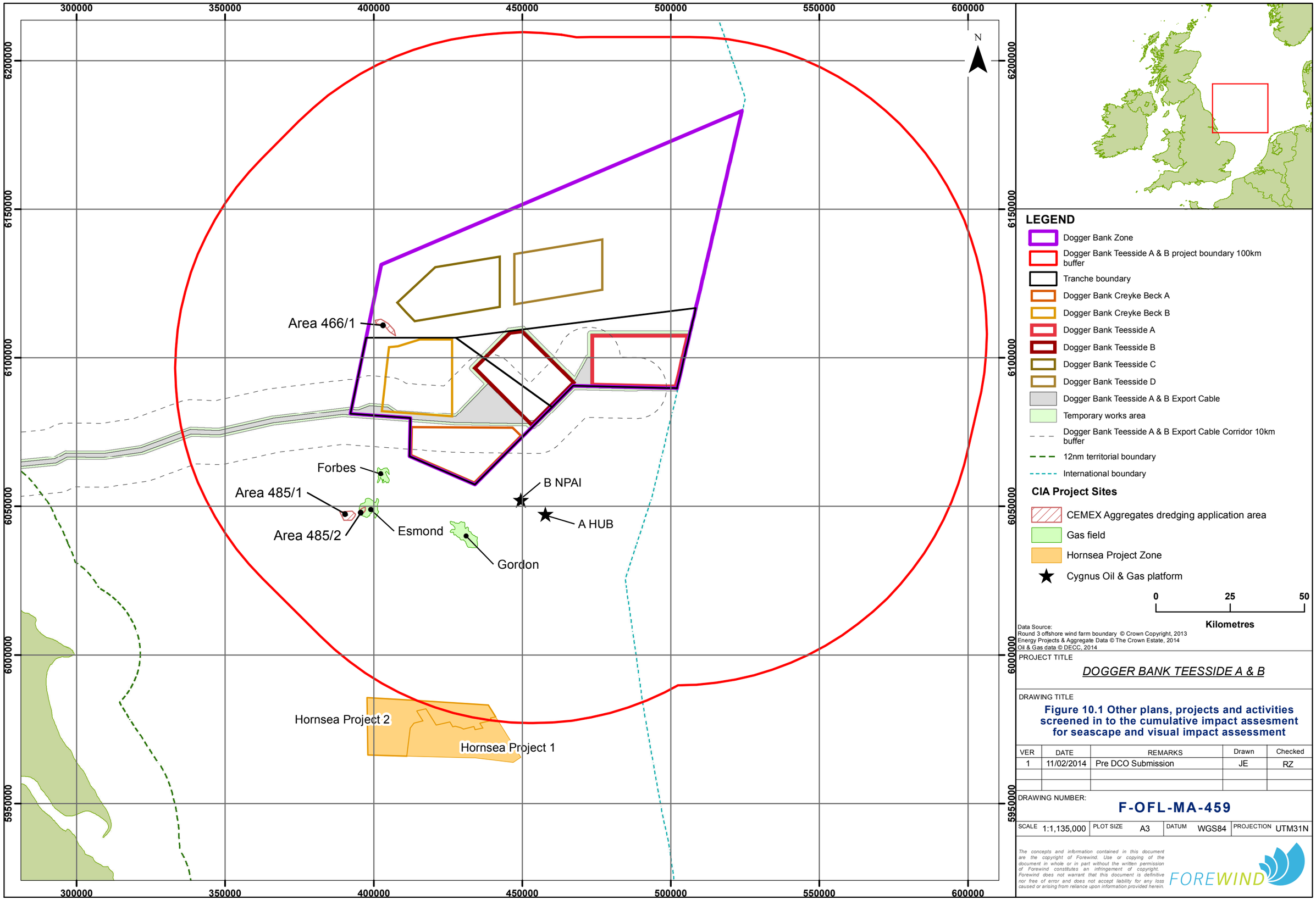

LEGEND

- Dogger Bank Zone
- Dogger Bank Teesside A & B project boundary 100km buffer
- Tranche boundary
- Dogger Bank Creyke Beck A
- Dogger Bank Creyke Beck B
- Dogger Bank Teesside A
- Dogger Bank Teesside B
- Dogger Bank Teesside C
- Dogger Bank Teesside D
- Dogger Bank Teesside A & B Export Cable
- Temporary works area
- Dogger Bank Teesside A & B Export Cable Corridor 10km buffer
- 12nm territorial boundary
- International boundary

CIA Project Sites

- CEMEX Aggregates dredging application area
- Gas field
- Hornsea Project Zone
- Cygnus Oil & Gas platform

0 25 50

Kilometres

Data Source:
Round 3 offshore wind farm boundary © Crown Copyright, 2013
Energy Projects & Aggregate Data © The Crown Estate, 2014
Oil & Gas data © DECC, 2014

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 10.1 Other plans, projects and activities screened in to the cumulative impact assesment for seascape and visual impact assessment

VER	DATE	REMARKS	Drawn	Checked
1	11/02/2014	Pre DCO Submission	JE	RZ

DRAWING NUMBER:

F-OFL-MA-459

SCALE	PLOT SIZE	DATUM	PROJECTION
1:1,135,000	A3	WGS84	UTM31N

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Table 10.1 Cumulative Assessment Screening summary

Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A&B	Confidence in project details	Confidence in project data	Carried forward to cumulative impact assessment?
Offshore wind farm	Hornsea Round 3 Zone Project One	Pre-application	Unknown	122 / 101km from Teesside A / B (wind farm boundary)	Medium	Medium	Yes
Offshore wind farm	Hornsea Round 3 Project Two	Pre-application	Unknown	112.59/ 94.92km from Teesside A / B (wind farm boundary)	Medium	Medium	Yes
Offshore wind farm	Dogger Bank Creyke Beck A & B	Examination	Unknown	28.05 / 4.05km from Teesside A / B (wind farm boundary 45.97 / 6.20km from Teesside A / B (wind farm boundary	High	High	Yes
Offshore wind farm	Dogger Bank Teesside C & D	Pre-application	Unknown	31.10 / 8.06km from Teesside A / B (wind farm boundary 13.46 / 8.08km from Teesside A / B (wind farm boundary)	Medium	Medium	Yes
Oil and gas	Gordon gasfield	Inactive	N/A	62.46 / 39.33km from Teesside A / B (wind farm boundary)	Low	Low	No

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Type of project	Project title	Project status	Predicted construction period	Distance from Dogger Bank Teesside A&B	Confidence in project details	Confidence in project data	Carried forward to cumulative impact assessment?
Oil and gas	Forbes gasfield	Inactive	N/A	73.75 / 49.96km from Teesside A / B (wind farm boundary)	Low	Low	No
Oil and gas	Esmond gasfield	Inactive	N/A	80.85 / 56.78km from Teesside A / B (wind farm boundary)	Low	Low	No
Platform	Cygnus B NPAI	Approved	2012 - 2014	47.20 / 27.14km from Teesside A / B (wind farm boundary)	Medium	High	Yes
Platform	Cygnus A HUB	Approved	2012 - 2014	47.31 / 30.09km from Teesside A / B (wind farm boundary)	Medium	High	Yes
Aggregates area	Cemex (Area 466/1)	Application	Unknown	65 / 28km from Teesside A / B (wind farm boundary)	High	High	No. Although some vessel movement will be visible, the scale of activities is not of a comparable nature or scale and it will not give rise to seascape and visual impacts.
Aggregates area	Cemex (Area 485 A)	Application	Unknown	90 / 63km from Teesside A / B (wind farm boundary)	High	High	
Aggregates area	Cemex (Area 485 B)	Appilcation	Unknown	86 / 59km from Teesside A / B (wind farm boundary)	High	High	

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Types of cumulative impact

10.1.13. Current guidance (SNH 2012) distinguishes cumulative landscape impacts (which can also be taken to include seascape) and cumulative visual impacts. The potential cumulative impacts on seascape and views that are assessed therefore include:

- Impacts on seascape character; and
- Impacts on views.

10.1.14. The guidance for assessing the cumulative impact of onshore wind energy developments (SNH 2012) describes different types of potential visual impacts in relation to wind farms, and which are broadly applicable to this assessment:

- Combined or successive visual impacts, where two or more wind farms will be visible from a single location, with a viewer needing to turn their head to experience a successive impact; and
- Sequential visual impacts, where one or more wind farms will be seen in sequence as the observer moves along a linear route, for example, a road or long-distance footpath.

10.2. Cumulative impacts of Dogger Bank Teesside A & B with Dogger Bank Teesside C & D and Dogger Bank Creyke Beck A & B

10.2.1. Dogger Bank Teesside C & D is the third phase of the Dogger Bank development and will comprise two wind farms, each with a generating capacity of up to 1.2GW, and will connect to the National Grid just south of the Tees Estuary.

10.2.2. At this stage, the construction phasing is not known, and the projects could be developed concurrently or in sequence. The construction of Dogger Bank Teesside C & D has the potential to give rise to cumulative impacts at the landfall and within the inshore waters, as the landfall is located within approximately 1km of Dogger Bank Teesside A & B. No cumulative impacts are anticipated in relation to the landfall and export cable route works for Dogger Bank Creyke Beck due to the distance between the two landfall areas.

10.2.3. When operational, Dogger Bank Teesside A & B will have the potential to give rise to combined cumulative impacts with Dogger Bank Teesside C & D and Dogger Bank Creyke Beck.

10.2.4. The ‘worst case’ (maximum impact) scenario defined is based on the following assumptions:

- Construction of the Dogger Bank Teesside A & B projects, including the construction of the offshore turbines and ancillary structures and export cable routes, will occur concurrently with Dogger Bank Teesside C & D and Dogger Bank Creyke Beck; and
- Dogger Bank Teesside A & B will be operational at the same time as Dogger Bank Teesside C & D and Dogger Bank Creyke Beck, and the

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wind turbines and ancillary surface features will exist concurrently for up to 50 years.

Impacts during construction

10.2.5. The Dogger Bank Teesside C & D Export Cable Corridor will come onshore to the south east of Redcar, approximately 0.8km to the north of the Dogger Bank Teesside A & B landfall.

10.2.6. The extent of additional construction work along this stretch of coast line is likely to lead to some localised, temporary changes of a low magnitude in landscape and seascape character on the area between Redcar and Marske. Activities will give rise to short term change on the seascape character of a medium magnitude, reducing to negligible in the long term as restoration works for both projects are carried out. The additional cumulative impacts on the seascape resulting from the construction of Dogger Bank Teesside C & D are predicted to be **minor adverse**.

10.2.7. The construction activities will be visible in combined and successive views from the beach, inshore waters and inland areas. Visual receptors at the edge of Redcar and Marske-by-the-Sea (land-based visual receptors 1, 2 and 3 in **Table 4.5** will experience short-term, reversible additional changes in seaward views and views along the coast of a medium magnitude. Water-based visual receptors within the inshore waters will gain combined and successive views of construction activities at two points along the coast out to approximately 2-3km from the shore, as well as the additional movement of construction vessels within the inshore waters associated with the laying of the off-shore export cable for Dogger Bank Teesside C & D. Visual receptors located further away to the south (land-based visual receptors 4-8) are not predicted to experience additional cumulative change in views, as the Dogger Bank Teesside C & D landfall will not be visible from these locations.

10.2.8. Additional cumulative visual impacts affecting land-based visual receptors within approximately 1km of the landfall and sea-based visual receptors out to approximately 2-3km from the shore will be **moderate adverse** during the periods of construction, reducing to **none** post-construction.

Impacts during operation

10.2.9. The projects will form distinct wind turbine arrays. The turbines will be associated with the views from the open sea, affecting similar types of marine based receptors, i.e. receptors on vessels passing through the area.

10.2.10. Additional cumulative impacts on the seascape and views will arise as a result of development being present over a larger area, increasing the extent and duration of views of wind turbines available to receptors potentially present around the development area.

10.2.11. Within the wider context of the southern North Sea, the additional magnitude of change will be low, and the cumulative seascape and visual impacts over and above those resulting from the projects in isolation will be **low**.

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10.3. Cumulative Impacts of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck A & B with other schemes

Hornsea Round 3 Zone Projects One and Two

10.3.1. Hornsea Round 3 Zone Projects One and Two cover an area of approximately 407km^2 and 400km^2 respectively, they are located approximately 89km offshore from the East Riding of Yorkshire coast. The projects will consist of up to 332 turbines within Project One and 360 turbines within Project Two. At their closest point they lie approximately 77km to the south of the Dogger Bank Zone. Therefore, should the area be developed, there is theoretically the potential for intervisibility between the two schemes from the areas of the North Sea which lie between the Hornsea Round 3 Zone and the Dogger Bank Zone. This would only be during periods of very clear atmospheric conditions.

10.3.2. The 'worst case' (maximum impact) scenario defined is based on the following assumptions:

- Construction of the Hornsea Round 3 Projects One and Two, including the construction of the offshore turbines and ancillary structures and export cable routes, will occur concurrently with Dogger Bank Teesside A & B, Dogger Bank Creyke Beck A & B and Dogger Bank Teesside C & D;
- The Hornsea Round 3 Projects One and Two will be operational at the same time as Dogger Bank Teesside A & B, Creyke Beck A & B and Teesside C & D, and the wind turbines and ancillary surface features will exist concurrently up to 50 years.

10.3.3. The Hornsea Round 3 Projects One and Two will be of a large scale, and likely to be widely visible across an extensive area of the open sea as well as being visible from the coast. There will be no cumulative impacts on the character of seascape units immediately adjoining the coast, or visual impacts on land-based visual receptors arising as a result of the addition of the Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck A & B wind farms, as these will not be visible from the coast or inshore waters.

10.3.4. Successive and sequential views of the projects may be available for sea-based receptors, including predominantly commercial vessels and fishing vessels of low sensitivity, travelling across the North Sea to or from Hull. RYA data indicates no cruising routes that pass within 50km of Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck A & B that will also pass the Hornsea Round 3 Zone.

10.3.5. Assuming a worst case scenario in which construction activities for the installation of the offshore cable routes for both Dogger Bank Teesside A & B, Dogger Bank Teesside C & D and Dogger Bank Creyke Beck A & B, the additional magnitude of change will be low and the level of cumulative seascape and visual impacts will be **minor**.

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Cygnus B NPAI and Cygnus A Hub

10.3.6. The Cygnus Oil and Gas Field is located to the south of the Dogger Bank Zone. Infrastructure visible above the sea surface will include the Cygnus Bravo platform approximately 27km to the south west of Dogger Bank Teesside B and 47km to the south west of Dogger BankTeesside A, and the Alpha Platform, located 30km to the south west of Dogger Bank Teesside B and 47km to the south west of Dogger Bank Teesside A. At these distances, there will be intervisibility between the projects during the operational phase. Effects will occur as a consequence of the additional lighting and vessel movements as well as the presence of the surface structures themselves.

10.3.7. The introduction of an extensive area of wind turbines within relatively close proximity to the oil and gas platform will give rise to effects on the character of the seascape within the development area and within the vicinity of the platforms of a high magnitude, but this is considered to be an area of low sensitivity. Overall the level of additional cumulative effects on seascape character will be minor within this localised area, reducing to negligible in the context of the southern North Sea.

10.3.8. Visual effects will potentially occur where transitory receptors travel between Dogger Bank Teesside A & B or within approximately 25km of the Cygnus B and Cygnus A developments. The magnitude of change will reduce with distance from the developments. The receptors potentially present are of low sensitivity and the overall resulting cumulative effect will be minor, reducing to negligible beyond approximately 25km of Cygnus B and A (the approximate limit of theoretical visibility of these projects, assuming clear weather conditions).

10.3.9. The construction of the Cygnus platforms will not coincide with construction of the wind farms and therefore no cumulative construction effects are anticipated.

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11. Transboundary Effects

11.1.1. This section has considered the potential for transboundary impacts (impacts across international boundaries) to occur on sea-based visual receptors as a result of the construction, operation or decommissioning of Dogger Bank Teesside A & B.

11.1.2. Visibility of the development, in all four operational scenarios, will not be possible from areas beyond the UK continental shelf limit, including Germany, Netherlands, Norway and Denmark. Transboundary impacts will be limited to sequential views of operational wind farms experienced by transitory receptors travelling across the North Sea, and who may potentially pass a number of offshore wind farms.

11.1.3. When considered in the context of the southern North Sea, the magnitude of change will be low and the transboundary cumulative seascape and visual impacts will be **negligible**.

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12. Summary

12.1.1. This chapter of the ES has assessed the potential impact of Dogger Bank Teesside A & B on the baseline seascape and visual environment, and on surface historic seascape character.

12.1.2. The SVIA identified no significant impacts on the seascape character at the landfall, across inshore waters and the cable route study areas. There will be no significant impacts on the coastal character of the study area as a result of the construction of the landfall and installation of the offshore export cables. There will be no significant impacts on these areas as a result of the construction and operation of the offshore development due to the distance of the wind turbines offshore.

12.1.3. Moderate impacts on the seascape character of the development area are predicted, although within the context of the North Sea, these will be **minor adverse**.

12.1.4. The level of visual impact as a result of the presence of wind turbines within areas up to 15-20km from the development area boundary will be **moderate adverse** in clear weather conditions, affecting a small number of transient recreational receptors. Beyond this, the visual impact will be **minor adverse** or **negligible**. As distances increase, the development will be seen at diminishing scales and will occupy an increasingly small extent of the skyline. The overall experience of receptors travelling across the North Sea is unlikely to be affected.

12.1.5. The Dogger Bank Teesside A & B development will alter surface historic seascape character from the currently recorded types to (following the terms advised in the National Method Statement) 'Renewable energy installation'. While the existing recorded types are generally of low sensitivity, the extent and totality of the change is of high magnitude. However, in the context of the affected HSC sub-types, the impacts are not judged to be significant.

12.1.6. Potential cumulative impacts were considered in relation to Dogger Bank Creyke Beck A & B (within the Dogger Bank Zone), Dogger Bank Teesside C & D (within the Dogger Bank Zone), Hornsea Project One and Two, Westermost Rough Wind Farm, and Humber Gateway Wind Farm. No significant cumulative impacts are predicted.

12.1.7. Negligible transboundary impacts are predicted for seascape and visual receptors.

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Table 12.1 Summary of predicted impacts of Dogger Bank Teesside A & B on landscape and visual receptors

Description of Impact	Key Mitigation Measures	Residual Impact (Worst Case Scenario)
Construction Phase		
Landfall and inshore area		
Direct and indirect impacts on seascape character and resources	None proposed, see Section 6.2: Mitigation.	**Minor adverse**
Visual impacts		
Bydale Howle, Marske Sands	See above	**Moderate adverse** reducing to **none** post-construction
Millclose Howle, Redcar Sands		**Moderate adverse** reducing to **none** post-construction
Valley Gardens, Marske Sands		**Minor adverse** reducing to **none** post-construction
Church Howle, Marske-by-the-Sea		**Minor adverse** reducing to **none** post-construction
Windy Hill Farm and Windy Hill Lane, Marske-by-the-Sea		**Minor adverse** reducing to **none** post-construction
Saltburn Pier and promenade		**Negligible**
Zetland Park, Redcar Sands		**Minor adverse** reducing to **none** post-construction
Warsett Hill		**Negligible**
Sailing vessels		**Minor adverse**
Impacts on historic seascape character	See above	**Negligible**
Offshore export cable		
Impacts on seascape character	See above	**Negligible**
Visual impacts		**Negligible**
Historic seascape character		**Negligible**
Dogger Bank Teesside A & B development area		
Direct and indirect impacts on seascape character	See above	**Moderate adverse**
Visual impacts		**Minor adverse**
Historic seascape character		**Minor adverse**
Operational Phase		
Seascape character	Detailed siting, design and detailing of ancillary infrastructure such as lighting and signage, according to such guide as *Siting and Designing Wind Farms in the Landscape* (SNH 2009).	**Moderate adverse**
Visual impacts		**Minor adverse**
Historic seascape character		**Minor adverse**
Decommissioning		
As for construction		

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13. References

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