DOGGER BANK D WIND FARM

Preliminary Environmental Information Report

Volume 1

Chapter 5 Site Selection and Consideration of Alternatives

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Appendix 5.1	Consultation Responses for Site Selection and Consideration of Alternatives

Glossary

Term	Definition
Area of Search	Broad geographical areas within which further site selection work would be undertaken to identify potential options for siting infrastructure elements associated with the Project.
Birkhill Wood Substation	The onshore grid connection point for DBD identified through the Holistic Network Design process. Birkhill Wood Substation which is being developed by National Grid Electricity Transmission and does not form part of the Project.
Black-Red-Amber-Green (BRAG) Assessment	An assessment used to evaluate potential options by classifying risks or opportunities associated with an option using a colour-coded criteria based on the scale of environmental or engineering risks to development.
Array Area	The area within which the wind turbines, inter-array cables and offshore platform(s) will be located.
Design	All of the decisions that shape a development throughout its design and pre-construction, construction / commissioning, operation and, where relevant, decommissioning phases.
Development Consent Order (DCO)	A consent required under Section 37 of the Planning Act 2008 to authorise the development of a Nationally Significant Infrastructure Project, which is granted by the relevant Secretary of State following an application to the Planning Inspectorate.
Energy Storage and Balancing Infrastructure (ESBI)	A range of technologies such as battery banks to be co-located with the Onshore Converter Station, which provide valuable services to the electrical grid such as storing energy to meet periods of peak demand and improving overall reliability.
Engineering Assumptions	Assumptions on the spatial requirements and design parameters needed to deliver the Project based on preliminary design information and professional judgment.
Environmental Statement (ES)	A document reporting the findings of the EIA which describes the measures proposed to mitigate any likely significant effects.
Evidence Plan Process (EPP)	A voluntary consultation process with technical stakeholders which includes a Steering Group and Expert Topic Group (ETG) meetings to encourage upfront agreement on the nature, volume and range of supporting evidence required to inform the EIA and HRA process.
Expert Topic Group (ETG)	A forum for targeted technical engagement with relevant stakeholders through the EPP.
Grid Connection	The offshore and onshore electricity transmission network connection to Birkhill Wood Substation.
Inter-Array Cables	Cables which link the wind turbines to the offshore platform(s).

Term	Definition
Jointing Bays	Underground structures constructed at regular intervals along the onshore export cable corridor to facilitate the joining of discrete lengths of the installation of cables.
Landfall	The area on the coastline, south-east of Skipsea, at which the offshore export cables are brought ashore, connecting to the onshore export cables at the transition joint bay above Mean High Water Springs.
Link Boxes	Structures housing electrical equipment located alongside the jointing bays in the onshore export cable corridor and the transition joint bay at the landfall, which could be located above or below ground.
Micro-Siting	An embedded mitigation measure that involves siting the specific location of the infrastructure to avoid or minimise impacts to receptors.
Offshore Development Area	The area in which all offshore infrastructure associated with the Project will be located, including any temporary works area during construction, which extends seaward of Mean High Water Springs. There is an overlap with the Onshore Development Area in the intertidal zone.
Offshore Export Cable Corridor (ECC)	The area within which the offshore export cables will be located, extending from the DBD Array Area to Mean High Water Springs at the landfall.
Offshore Export Cables	Cables which bring electricity from the offshore platform(s) to the transition joint bay at landfall.
Offshore Platform(s)	Fixed structures located within the DBD Array Area that contain electrical equipment to aggregate and, where required, convert the power from the wind turbines, into a more suitable voltage for transmission through the export cables to the Onshore Converter Station. Such structures could include (but are not limited to): Offshore Converter Station(s) and an Offshore Switching Station.
Onshore Converter Station (OCS) Zone	The area within which the Onshore Converter Station and Energy Storage and Balancing Infrastructure will be located in vicinity of Birkhill Wood Substation.
Onshore Converter Station (OCS)	A compound containing electrical equipment required to stabilise and convert electricity generated by the wind turbines and transmitted by the export cables into a more suitable voltage for grid connection into Birkhill Wood Substation.
Onshore Development Area	The area in which all onshore infrastructure associated with the Project will be located, including any temporary works area required during construction and permanent land required for mitigation and enhancement areas, which extends landward of Mean Low Water Springs. There is an overlap with the Offshore Development Area in the intertidal zone.

Term	Definition
Onshore Export Cable Corridor (ECC)	The area within which the onshore export cables will be located, extending from the landfall to the Onshore Converter Station Zone and onwards to Birkhill Wood Substation.
Onshore Export Cables	Cables which bring electricity from the transition joint bay at landfall to the Onshore Converter Station zone (HVDC cables) and from the Onshore Converter Station zone onwards to Birkhill Wood Substation (HVAC cables).
Scoping Opinion	A written opinion issued by the Planning Inspectorate on behalf of the Secretary of State regarding the scope and level of detail of the information to be provided in the Applicant's Environmental Statement. The Scoping Opinion for the Project was adopted by the Secretary of State on 02 August 2024.
Scoping Report	A request by the Applicant made to the Planning Inspectorate for a Scoping Opinion on behalf of the Secretary of State. The Scoping Report for the Project was submitted to the Secretary of State on 24 June 2024.
Scour Protection	Protective materials used to avoid sediment erosion from the base of the wind turbine foundations and offshore platform foundations due to water flow.
Site Selection Principles	Environmental and engineering principles that were developed from the outset of the site selection process and adhered to at each stage to provide a systematic framework for decision-making.
Temporary Construction Compounds	Areas set aside to facilitate the construction works for the onshore infrastructure, which include the landfall construction compound, main and intermediate construction compounds for onshore export cable works and OCS and ESBI construction compounds.
The Applicant	SSE Renewables and Equinor acting through 'Doggerbank Offshore Wind Farm Project 4 Projco Limited'.
The Project	Dogger Bank D Offshore Wind Farm Project, also referred to as DBD in this PEIR.
Transition Joint Bay (TJB)	An underground structure at the landfall that houses the joints between the offshore and onshore export cables.
Wind Turbines	Power generating devices located within the DBD Array Area that convert kinetic energy from wind into electricity.

5 Site Selection and Consideration of Alternatives

5.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) presents an overview of the site selection process and consideration of alternatives undertaken for the Dogger Bank D Offshore Wind Farm (hereafter 'the Project' or 'DBD').

2. Site selection is an iterative process with selection and refinement of the development area ongoing throughout the pre-application stage. This chapter describes the process undertaken to date to identify the preferred option(s) for siting infrastructure components associated with the Project and explains the outcomes that have led to the identification of the Offshore and Onshore Development Areas assessed within the PEIR.

5.2 Key Project Components

3. The key offshore components of the Project comprise the following:

- Wind turbines;
- Foundation structures for wind turbines and offshore platforms;
- Scour and cable protection;
- Offshore platform(s), including Offshore Converter Station(s) and an Offshore Switching Station (hereafter collectively referred to as offshore platforms unless specified);
- Inter-array cables; and
- Offshore export cables.

4. The key onshore components of the Project comprise the following:

- Landfall and associated transition joint bay (TJB) and link box;
- Onshore export cables and associated jointing bays and link boxes; and
- Onshore Converter Station (OCS) and co-located Energy Storage and Balancing Infrastructure (ESBI).

5. Further details on the infrastructure components associated with the Project are provided in **Chapter 4 Project Description**.

5.3 Legislation, Policy and Guidance

6. The site selection process for offshore wind farms in the UK is governed by the existing legislative, policy and guidance framework for the development of energy infrastructure and environmental assessments (see **Chapter 3 Policy and Legislative Context**). **Table 5-1** summarises the key pieces of national, regional and local legislation, policy and guidance that informed the site selection methodology for the Project.

Table 5-1 Key Legislation, Policy and Guidance Considered during the Site Selection Process

Level	Legislation / Policy / Guidance	Description
Legislation		
National	The Planning Act 2008	The primary legislation setting the legal framework for applying for, examining and determining applications for Nationally Significant Infrastructure Projects (NSIP).
	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) ('The EIA Regulations')	The secondary legislation governing the Planning Act 2008 process with respect to the assessment of an NSIP's likely significant environmental effects and their consideration in the determination of development consents. Schedule 4 of the EIA Regulations requires that an ES includes: *'a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.'*
	The Conservation of Habitats and Species Regulations 2017 (as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (the 'HRA Regulations')	The legislation governing the process of preparing Habitats Regulation Assessment (HRA) to determine the potential for adverse effect on the integrity and features of a National Site Network site from a development. Where a "derogation" is required the HRA Regulations require developments to consider alternative solutions to inform the derogation case. Reasonable alternatives should be considered if they achieve the development's objectives, are financially, legally and technically feasible and are less damaging to the National Site Network or its interest features.

Level	Legislation / Policy / Guidance	Description
Policy		
National	Overarching NPS for Energy (EN-1) (DESNZ, 2023a)	Section 4.3 of NPS EN-1 notes that there are no requirements to consider alternatives or establish whether the proposed development represents the best option from a policy perspective. However, it highlights that a competent ES should include information of the reasonable alternatives studied and the main reasons for the selected option, accounting for environmental, social, economic, and where relevant, technical and commercial factors. With respect to decision-making, NPS EN-1 states that the consideration of alternatives should be undertaken in a proportionate manner and that *'only alternatives that can meet the objectives of the proposed development need to be considered.'* NPS EN-1 has been updated to reflect the revised policy position on coordination between developments. Section 3.3 notes that to reduce infrastructure costs and cumulative effects on communities and the environment, *'coordination of onshore transmission, offshore transmission, offshore generation and interconnector developments should be considered at both the strategic and more detailed project design levels.'*
	NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b)	Section 2.3 of NPS EN-3 states that with respect to site selection and design, the *'specific criteria considered by applicants and the weight they give to them will vary from project to project'*. Section 2.8 outlines factors influencing site selection and the design of offshore wind generating infrastructure such as seabed and wind resource availability and designated sites. The importance of a coordinated approach to offshore-onshore transmission planning is highlighted, noting that '*the design of wind farms…should seek to be sufficiently flexible so that they are future-proofed as far as possible to enable future connections with different types of offshore transmission or wind farms respectively, where these are proposed to be spatially proximate.'*
	NPS for Electricity Networks Infrastructure (EN-5) (DESNZ, 2023c)	Section 2.2 of NPS EN-5 highlights that the *'initiating and terminating points…of new electricity networks infrastructure is not substantially within the control of the applicant'* and are rather determined by the location of new generating infrastructure and grid connection requirements. However, NPS EN-5 notes that '*applicants retain control in managing the identification of routeing and site selection between the identified initiating and terminating points.'*
		NPS EN-5 details considerations of holistic and strategic network planning for offshore-onshore transmission infrastructure, specifically Section 2.13 describes the approach to demonstrating considerations of coordination within the applicant's assessment.
	National Planning Policy Framework (NPPF) (2024)	The NPPF sets out the UK Government's planning policies for England in relation to the Town and Country Planning Act 1990 and how they are applied when determining planning applications. The NPPF does not contain specific policies for NSIP, which are determined in accordance with the Planning Act 2008 and relevant NPS but may still be considered as a relevant matter in decision making. A number of core principles within the NPPF are therefore considered of relevance to the Project, including those relating to building a strong and competitive economy, promoting healthy and safe communities and conserving and enhancing the natural environment.
Regional	East Inshore and East Offshore Marine Plans 2014 – 2034 North-east Inshore and North-east Offshore Marine Plans 2021 - 2041	The Marine Policy Statement provides the overarching framework for the preparation of Marine Plans. Marine Plans provide policy and spatial guidance for UK waters and underpin the marine planning system in England, they are used in decision-making to ensure sustainable development. The are of search for the Project's offshore infrastructure overlaps the East and North-east marine plans. These plans include vision and policy objectives and set out relevant considerations for the Project and its development.
Local	East Riding Local Plan 2012 – 2029 Draft East Riding Local Plan 2020 – 2039	The East Riding Local Plan sets out the overarching framework for land use and development planning in East Riding of Yorkshire, which overlaps with the area of search for the Project's onshore infrastructure. The site allocations and policies in the local plan provides material considerations in the assessment of development proposals.
Guidance		
National	The Planning Inspectorate's Advice Note Seven (2020)	The Advice Notes provide supplementary guidance on NSIP applications in relation to the Planning Act 2008. Advice Note Seven states that a good ES should *'explain the reasonable alternatives considered and the reasons for the chosen option taking into out the effects of the Proposed Development on the environment.'*

Level	Legislation / Policy / Guidance	Description
	Cable Route Identification and Leasing Guidelines: Transmission Assets for Offshore Renewable Installations (The Crown Estate, 2024)	This document provides guidance for developers on preparing applications to The Crown Estate for a cable route linked to an offshore renewable energy installation. Appendix 1 of the document sets out the Cable Route Protocol, which comprises a series of principles and requirements for the planning of offshore transmission infrastructure to ensure due consideration for the environmental and other marine users. Compliance with the protocol must be demonstrated in a Cable Route Identification and Approval application as part of obtaining an Agreement for Lease for the transmission assets. Although intended specifically for offshore transmission infrastructure, The Crown Estate notes that the protocol can be applied to onshore transmission infrastructure planning.
	Guidelines on Substation Siting and Design ('The Horlock Rules') (NGC, 2006)	The Horlock Rules set out National Grid's best practice recommendations on the siting of onshore substations / converter stations and consideration of constraints such as amenity and nature conservation areas.
	EIA Guidance to Shaping Quality Development (IEMA, 2015)	This Institute of Environmental Management and Assessment's (IEMA) document establishes principles and framework for maximising the interaction between environmental mitigation and project design during the development process. The guidance notes that the earlier the interaction between the EIA and design processes, the more cost-effective and positive the outcomes. Consideration of alternatives with respect to location, layout and design are identified as early measures to avoid and minimise environmental effects.

5.4 Consultation

7. Consultation on site selection and alternatives has been undertaken with statutory and non-statutory consultees, communities, landowners and asset owners to communicate key project updates and seek feedback to refine the options considered for the Project. Consultation activities to date have included the following (see **Chapter 7 Consultation**):

- Scoping Opinion received from the Planning Inspectorate on 2nd August 2024 in response to the EIA Scoping Report;
- Ongoing Evidence Plan Process (EPP) and other technical consultation with key consultees;
- Non-statutory consultation undertaken from 10th September to 22nd October 2024 with local communities; and
- Ongoing direct discussions with landowners and asset owners, parish and town councils and interest groups.

8. Non-statutory consultation responses from local communities relating to site selection have informed the site selection process, shaping the identification of the Onshore Development Area boundaries in the PEIR. The evolution and refinement of the Project's proposals will continue to consider relevant feedback received through statutory consultation and information gathered through engagement with technical stakeholders alongside further environmental and technical assessments.

9. A dedicated Site Selection Expert Topic Group (ETG) meeting was held on the 7th August 2024 to provide an update on the site selection work undertaken and discuss the short listed options for the landfall and onshore infrastructure. The ETG meeting was attended by:

- East Riding of Yorkshire Council;
- Environment Agency;
- Historic England; and
- Natural England.

10. In addition to the above, the Applicant consulted with Natural England on 10th April 2024 regarding options for the potential routing of the offshore Export Cable Corridor out from the Array Area. Natural England provided its Discretionary Advice Service (DAS) advice on this matter on 23rd April 2024.

11. Stakeholder feedback has informed the Applicant's decisions on site selection and alternatives, and these are presented in the relevant sections of this chapter.

5.5 Array Area and Grid Connection Point

12. This section provides context on the Project's site selection process and describes the initiating point at the Array Area and terminating point at the grid connection point at the National Grid substation (Birkhill Wood), as illustrated on **Figure 5-1**.

5.5.1 Array Area

13. As part of its third licensing round in 2008, The Crown Estate identified the Dogger Bank Zone, located between 125 and 290km off the east coast of Yorkshire, as one of the nine offshore wind farm development zones in the UK. Following the 2008 licensing round, four project areas were identified within the zone to take to development consent, namely Creyke Beck A, Creyke Beck B, Teesside A and Teesside B. In 2015, development consent was granted for all four project areas.

14. In 2017, the four project areas were restructured under new ownership arrangements. Creyke Beck A, Creyke Beck B and Teesside A were renamed as Dogger Bank A (DBA), Dogger Bank B (DBB) and Dogger Bank C (DBC) respectively and would progress collectively as the Dogger Bank Wind Farm in three build-out phases by SSE Renewables, Equinor and Vårgrønn. Teesside B was renamed as Sofia Offshore Wind Farm and would be progressed separately from the Dogger Bank Wind Farm by RWE.

15. Advances in turbine technology have enabled DBC to generate its full consented capacity using significantly fewer turbines and using only the western half of the consented array area. Dogger Bank D (DBD) (a fourth phase of the Dogger Bank Wind Farm) was identified for development within the eastern portion of the DBC consented array area. Development of DBD enables additional capacity to be generated from areas which rights for offshore wind development have previously been granted but would otherwise not be fully utilised.

16. In addition, a small area of overlap with DBC has been included within the DBD array area to seek to maximise the use of spare DBC turbine locations (illustrated on **Figure 5-2**). It should be noted that the DBC foundation installation campaign is yet to begin at the time of writing, and the use of this overlap within the Project is therefore dependent on DBC not requiring the identified spare locations. DBDs use of these spare locations is therefore subject to the outcomes of the foundation installation at DBC. At the time of writing, the DBD Array Area is 262km2 in size and is located 210km from the UK coast at its nearest point.

17. In 2023 The Crown Estate confirmed that a Plan-Level Habitats Regulation Assessment (HRA) would be undertaken to assess the collective environmental impact at plan level of DBD together with six other offshore wind projects identified in either The Crown Estate's Offshore Wind Leasing Round 3, or The Crown Estate's 2021 Offshore Wind Extensions opportunity, collectively known as the Capacity Increases Programme (CIP). In March 2025, The Crown Estate notified the Secretary of State of the conclusions reached under the Plan-Level HRA. In May 2025, the Secretary of State confirmed that TCE has adequately assessed the impacts of the plan on protected sites within the National Site Network and endorsed the outcome of the Plan-Level HRA to proceed with the CIP.

5.5.2 Grid Connection Point

18. Due to the network capacity required to connect large-scale generation infrastructure, offshore wind farms such as DBD need to be connected to a high voltage electricity transmission system. The national electricity transmission network in England (and Wales) is owned and maintained by the National Grid Electricity Transmission (NGET), while National Energy System Operator (NESO) – formerly known as National Grid Electricity System Operator (NGESO) – is responsible for the planning and operations of Great Britian's energy system. The Project's interface with the electricity transmission system is linked to the grid connection point identified by NESO through strategic network planning at the national level.

19. The historical approach to connecting offshore wind farms to the electricity transmission system involves individual radial connections developed on a project-by-project basis. The UK Government's announcement to deliver 50GW of offshore wind power by 2030 highlighted the need to reinforce existing offshore-onshore transmission infrastructure and build new infrastructure to accommodate the increasing generation capacity and electricity demand. However, within the NPS for energy infrastructure (EN-5, paragraph 2.13.5 to 2.13.8), the UK Government notes that a more coordinated approach to delivering offshore wind farms and transmission infrastructure is needed to reduce infrastructure costs and cumulative impacts on the environment and communities.

20. Therefore, the Offshore Transmission Network Review (OTNR) was initiated by the UK Government in 2020, which resulted in a strategic review of the UK's framework to delivering its future energy system. One of the core outputs of the OTNR was the Holistic Network Design (HND) exercise undertaken by NESO.

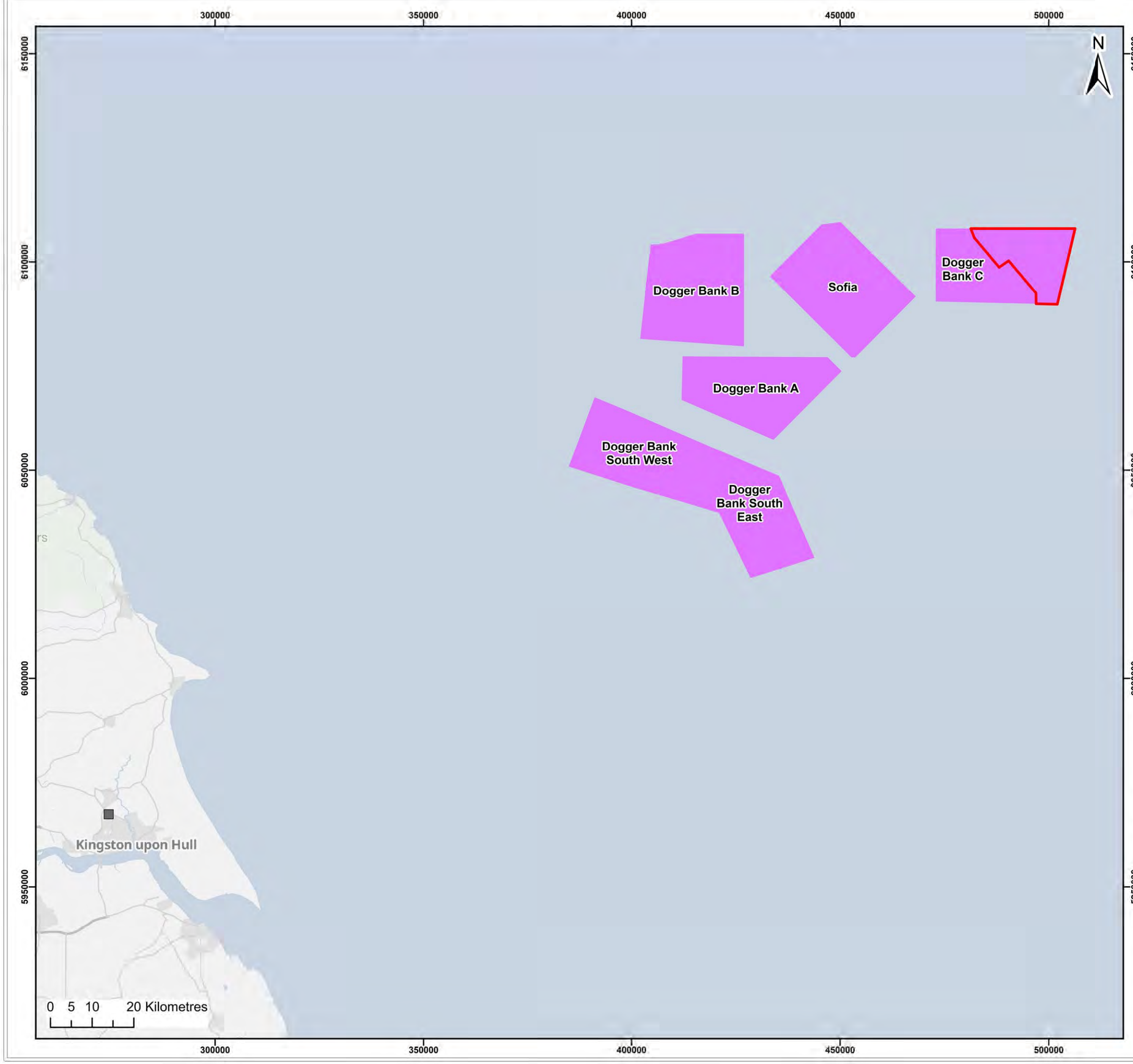
21. The HND sought to optimise the design of new onshore and offshore transmission infrastructure associated with offshore wind farms based on the criteria of economic cost, deliverability and operability, environmental and community impacts. Key outcomes of the HND were recommendations of grid connection points for new offshore wind farms and whether a coordinated connection design would be considered preferable to the counterfactual radial connection design (i.e. direct point-to-point connection between an offshore wind farm and the UK electricity transmission network).

22. The Project was included in the first HND exercise, which involved a comparative evaluation of grid connection options by regional zones. The Project formed part of the East Coast region due to its spatial and temporal proximity with other Round 4 offshore wind projects, and the outcomes of this HND exercise were published in the "Pathway to 2030" report in 2022.

23. In early 2024, NESO published the "South Cluster HND Impact Assessment", which revised the original HND design recommended to offshore wind projects off the east coast of England (including DBD). A radial connection to a new substation to be built in proximity to the existing Creyke Beck Substation in East Riding of Yorkshire (known as "Birkhill Wood Substation") was confirmed as the revised and optimal design for the Project.

24. The site selection exercise undertaken by the Applicant has been progressed based on an indicative location of the Birkhill Wood Substation provided by NESO and therefore aligns with outcomes of strategic network planning at the national level.

25. The Birkhill Wood Substation will be developed by NGET as part of "The Great Grid Upgrade" initiative and therefore does not form part of the Project or the DCO application. The precise location and layout of Birkhill Wood Substation will be determined by NGET and therefore does not fall within the scope of this Project's site selection exercise.



Legend:

- Dogger Bank D Array Area
- The Crown Estate's Offshore Wind Leasing Area
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Initiating and Terminating Points of the Dogger Bank D Site Selection Exercise

Figure: 5-1
Drawing No: PC6250-RHD-XX-ON-DR-GS-0170

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
03	20/05/2025	JH	AB	A3	1:900,000
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Co-ordinate system: WGS 1984 UTM Zone 31N

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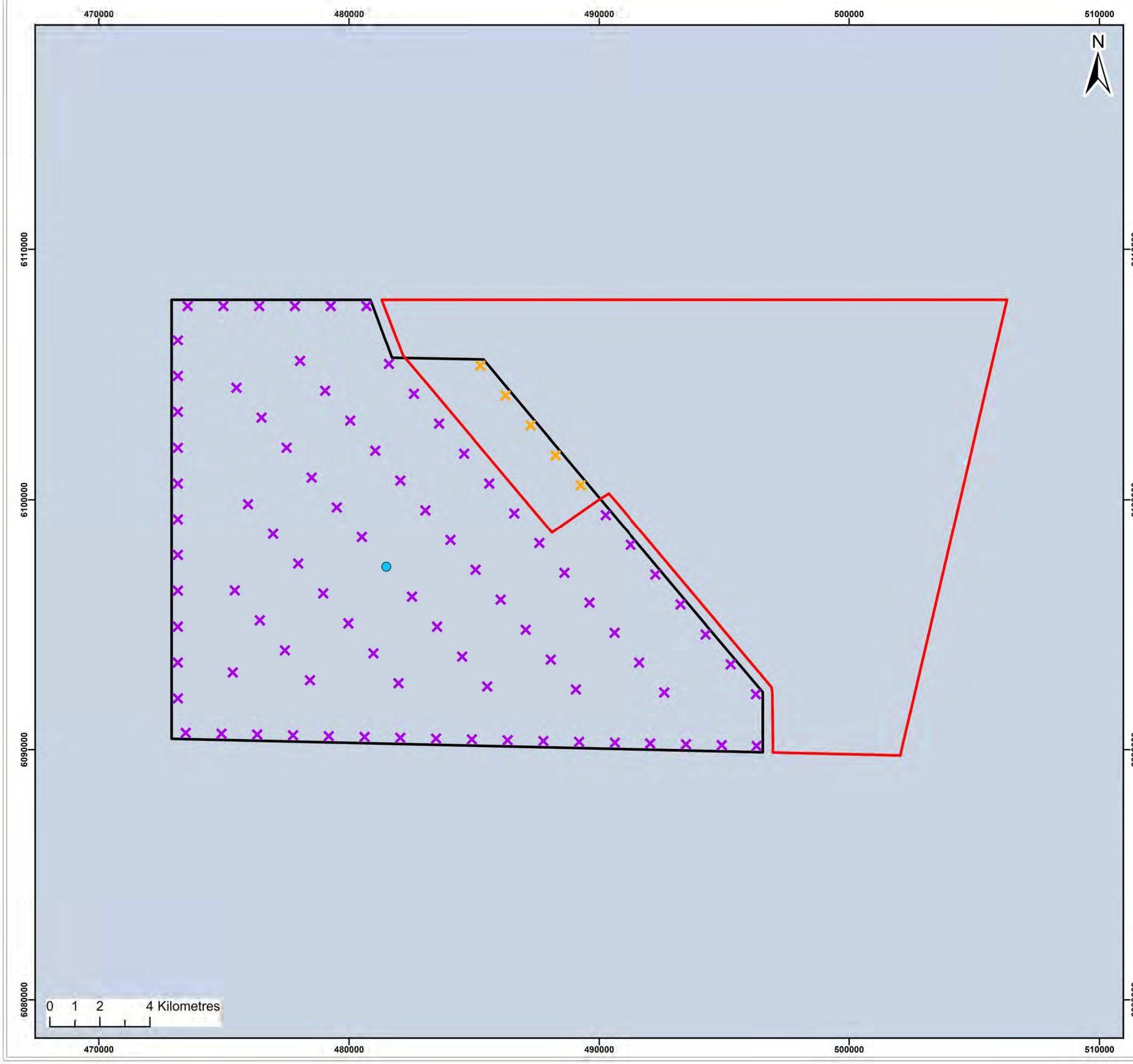

Legend:

- Dogger Bank D Array Area
- Dogger Bank C Boundary
- Dogger Bank C Turbine Layout
- Dogger Bank C Spare Turbine Locations
- Dogger Bank C Offshore Platform Location

Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Dogger Bank D Array Area Identification and Refinement

Figure: 5-2
Drawing No: PC6250-RHD-XX-OF-DR-GS-0540

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	10/02/2025	JH	AB	A3	1:150,000

Co-ordinate system: WGS 1984 UTM Zone 31N

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5.6 Consideration of Project Alternatives

26. A number of project-level alternatives with respect to design and technology have been considered as part of the site selection and project development process, which are detailed in **Table 5-2**.

27. Further details on alternatives considered with respect to the location of the Project's infrastructure is described in **Section 37** onwards.

Table 5-2 Project-Level Alternatives Considered Related to Design and Technology

Category	Alternatives Considered	Decision	Rationale
Design	Onshore transmission via overhead lines and pylons versus buried export cables	Onshore transmission via buried export cables (see Commitment IDs CO60 and CO61 in **Volume 2, Appendix 6.3 Commitments Register**)	Compared to overhead lines and pylons, buried onshore export cables would result in significant reductions in environmental and community impacts from permanent landscape and visual impacts and land take.
Design	Alternative landfall construction methodologies	Landfall cable installation using trenchless installation techniques (see Commitment ID CO23 in **Volume 2, Appendix 6.3 Commitments Register**)	Compared to open cut trenching at landfall, trenchless installation techniques would result in significant reductions in environmental impacts by minimising the excavation footprint and avoiding sensitive receptors on the coast. Trenchless installation techniques would also reduce community impacts by avoiding prolonged periods of access restrictions or closures to the beach during construction (with the exception of emergency landfall works where short periods of restricted access would be required).
Design	Alternative onshore export cable construction methodologies	Open cut trenching as the primary method of onshore export cable installation + trenchless installation techniques for major obstacle crossings (see Commitment IDs CO32, CO77 and CO83) in **Volume 2, Appendix 6.3 Commitments Register**)	To minimise the width of the temporary construction corridor, open cut trenching was determined to be the preferred method of onshore export cable installation. Where major obstacles are present within the corridor, trenchless installation techniques will be used to avoid the obstacle or minimise impacts on environmental and community receptors. Major obstacles are defined as: • Main rivers, Internal Drainage Board (IDB) owned or maintained drains and the Environment Agency's flood defences; • Railway lines; • Major roads (motorways, A roads and B roads); • Internationally, nationally and locally designated ecological sites and other sensitive ecological / landscape features such as ancient woodlands; and • Major utilities (national gas mains, pipelines and onshore transmission assets associated with other energy infrastructure developments).
Technology	Inclusion of ESBI into the Project	ESBI included into the Project Design Envelope	To provide valuable services to the electrical grid such as storing energy to meet periods of peak demand and improving overall reliability.
Technology	HVAC versus HVDC transmission design	HVDC transmission design	Due to distance from shore, several offshore compensation platforms would have been required within the offshore ECC for an HVAC transmission design. Selection of an HVDC transmission design significantly reduces the Project's offshore environmental impacts by reducing the level of infrastructure required.

5.7 Site Selection Process Overview

28. The aim of the site selection process is to identify preferred options for siting infrastructure components associated with the Project based on a balanced consideration of constraints and reasonable alternatives. The process aims to ensure that the options taken forward to consenting and development are deliverable whilst also avoiding and minimising environmental and community impacts as far as practicable.

29. The key steps of the site selection process are illustrated on **Plate 5-1**. While described as a staged approach, in practice, site selection is an iterative and ongoing process, and the steps shown were sometimes undertaken in parallel or were revisited as more information became available. The site selection process was supported by a multi-disciplinary team of environmental, consenting, engineering, land and stakeholder engagement specialists to enable holistic decision-making.

30. Based on the Array Area and the grid connection point described in **Section 5.5**, the site selection process was undertaken to identify areas to locate the offshore and onshore infrastructure components, which are: the landfall, offshore and onshore export cable corridors (ECC) and wider zones to co-locate the OCS and co-located ESBI known as the OCS zone.

31. Environmental and engineering site selection principles were developed using industry guidance and professional judgment and adhered to throughout the site selection process where practicable. These principles ensured that the avoidance and minimisation of environmental impacts were considered during decision-making. Key site selection principles are presented by infrastructure component in **Section 37** to **Section 5.11.**

32. In addition, engineering assumptions on the spatial and design parameters that would be required to deliver the Project were established to ensure options are technically feasible. Land, consenting, economic and stakeholder considerations were also factored into the decision-making at relevant stages of the site selection process.

33. The first step of the site selection process involved defining the Areas of Search (AoS) for the different infrastructure components (**Step 1**), which are broad geographical areas within which further site selection will be undertaken.

34. A constraints mapping exercise was subsequently undertaken to establish a long list of potential options for each infrastructure component (**Step 2**). A list of constraints used during the site selection process are provided in **Appendix A** at the end of this chapter. This was based on the site selection principles, engineering assumptions and constraints identified within the AoS. Options deemed to be unfeasible due to significant constraints, or those with viable alternatives that had fewer risks, were discounted at this stage.

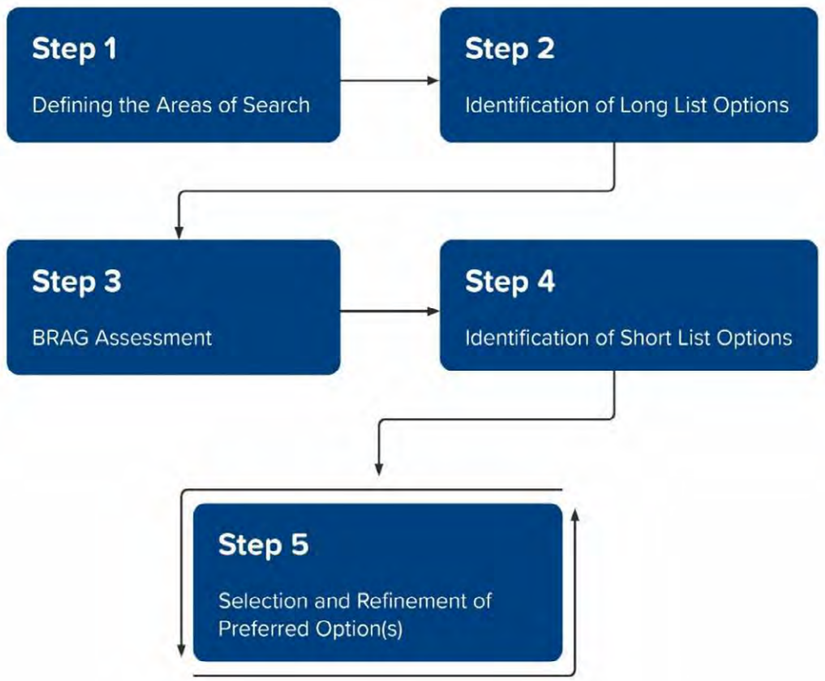


Plate 5-1 Key Steps in the Site Selection Process

35. Environmental and engineering considerations associated with each long list option were evaluated using a Black-Red-Amber-Green (BRAG) assessment (**Step 3**) on various topics as outlined in **Table 5-3**. The assessment involved classifying the risk or opportunity that would be presented by each option using the following colour-coded criteria:

- **Black** - Potential impediment to development with respect to environment or engineering risks;
- **Red** - High environment or engineering risk to development;
- **Amber** - Medium environment or engineering risk to development; and
- **Green** - Low environment or engineering risk to development.

36. Although the BRAG assessment was based on pre-mitigation risks, mitigation measures, such as micro-siting around constraints and the use of trenchless installation techniques, were considered when summarising the BRAG ratings. Professional judgement was used to determine whether mitigation measures would be available and likely to reduce the degree of risk posed by the constraint.

Table 5-3 Environmental and Engineering Topics Considered in the BRAG Assessment

Infrastructure Component	BRAG Topics
Offshore ECC	Environmental: Shipping and navigation, marine physical processes, other marine users, archaeology, marine mammals, fish and shellfish ecology, commercial fisheries, and benthic and intertidal ecology (including statutory and non-statutory designations)
	Engineering: Cable length, number and complexity of pinch points, number and degree of directional change, number and complexity of obstacle crossings, seabed conditions
Landfall, Onshore ECC and OCS zone	Environmental: Traffic and transport, noise and vibration, military and civil aviation, landscape and visual, land use and land quality, hydrology and flood risk, ecology and archaeology (including statutory and non-statutory designations)
	Engineering: Site topography, cable length and spacing, number and complexity of pinch points, cliff height, number and complexity of obstacle crossings, ground conditions

37. The BRAG assessment outcomes enabled the identification of the short list options, including reasonable alternatives, based on a balanced view of the risks and opportunities behind each option (**Step 4**). The short listed options were used to define the Offshore and Onshore Scoping Areas for the EIA Scoping Report submitted in June 2024 (Royal HaskoningDHV, 2024).

38. Where multiple options were short listed, further investigation to understand the scale of risks and mitigation requirements were undertaken to conclude the preferred option(s). The selected preferred option(s) were then iteratively refined leading to the Offshore and Onshore Development Areas identified for the PEIR (**Step 5**).

39. During refinement, engineering assumptions were revised to narrow down the site boundaries, and site selection principles were revised to account for new environmental and engineering constraints and appropriate setback distances from constraints following more detailed information gathering. Refinement leading up to the identification of the Onshore Development Area boundaries at PEIR stage has also been informed by relevant non-statutory consultation responses from local communities.

40. Further refinement will be undertaken through the EIA process, as additional engineering, environmental, land, economic and stakeholder information may become available leading up to the preparation of the ES which forms part of the DCO application submission. Refinement will also be undertaken based on relevant feedback received through statutory consultation undertaken post-PEIR publication and ongoing engagement with technical stakeholders leading up to DCO application submission.

5.8 Landfall

5.8.1 Defining the Landfall Area of Search

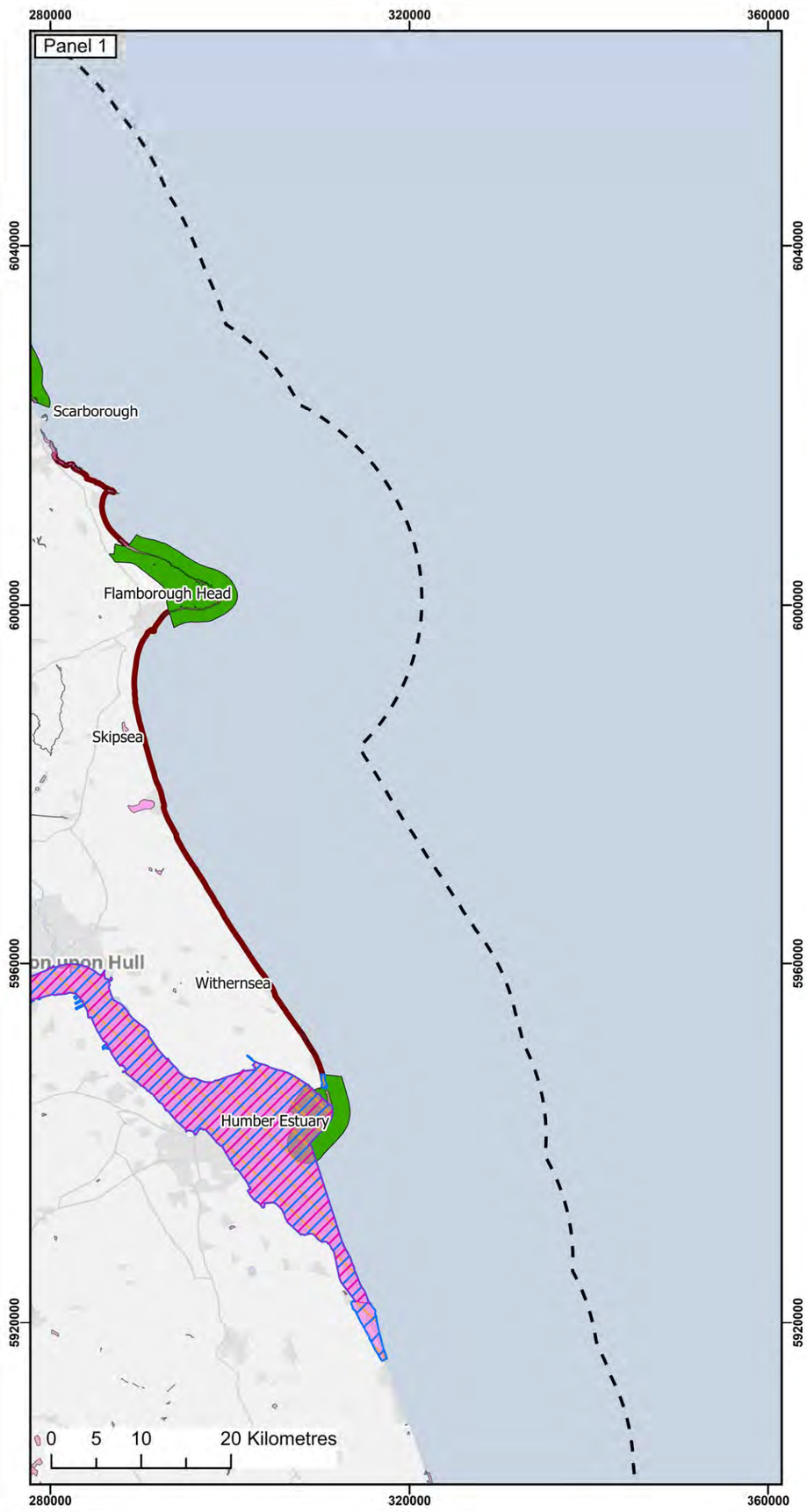
41. The broad landfall AoS was established by considering the entire Holderness coastline between Scarborough and north of the Humber Estuary. The total length of coastline contained within the broad landfall AoS was 59.1km as shown on **Panel 1** of **Figure 5-3**.

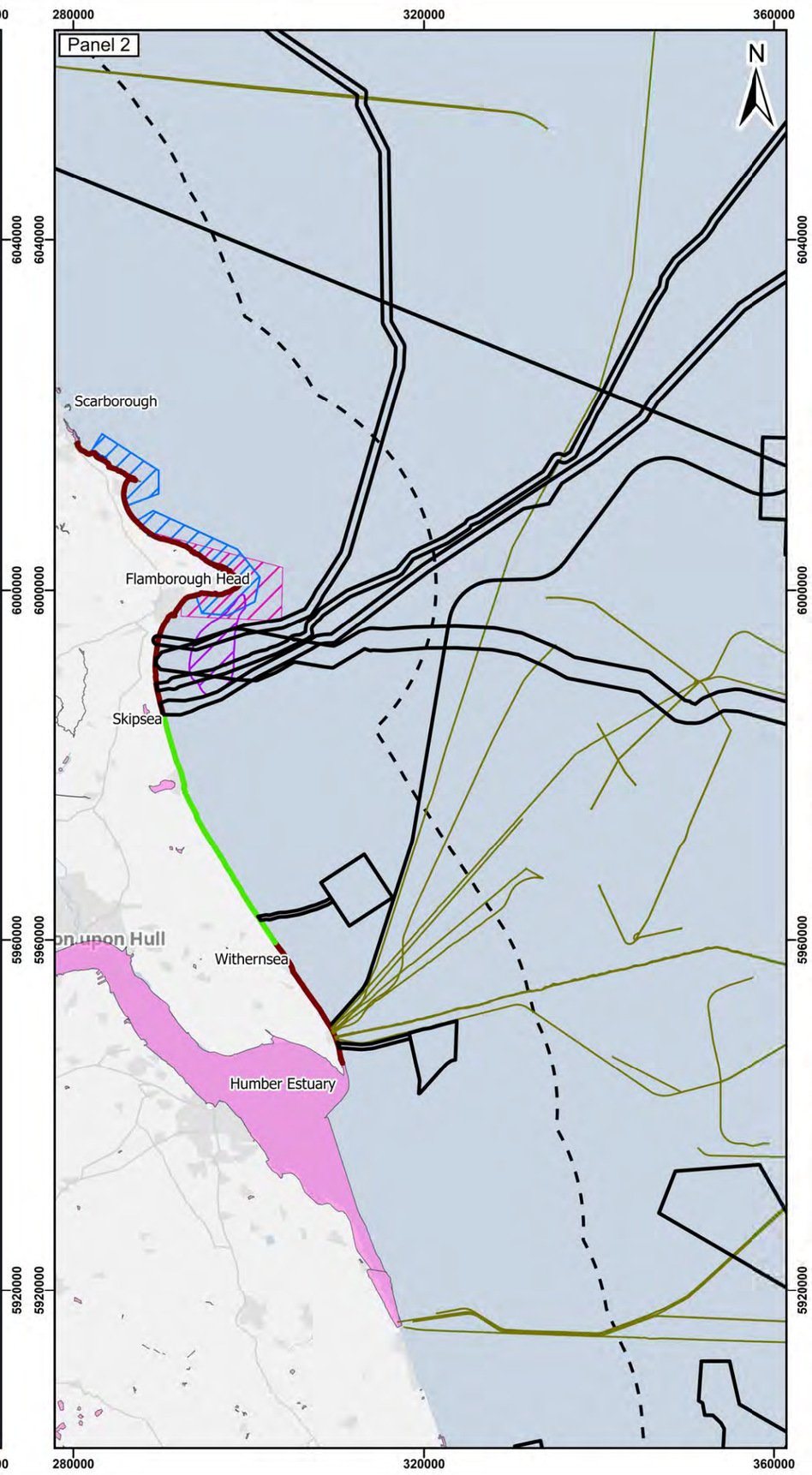
42. The most northerly boundary of the broad landfall AoS was established at Scarborough, as the North Riding Forest Park, North York Moors National Park and the North Yorkshire and Cleveland Heritage Coast are situated north of this point with various designated coastal Sites of Special Scientific Interest (SSSI) further north. It was considered that there are viable landfall options south of Scarborough and that these options would be less constrained, with fewer risks associated with their development.

43. The most southerly boundary of the broad landfall AoS was established at the northern bank of the Humber Estuary, as it was considered that the estuary itself would present too many nearshore constraints to route offshore export cables to landfall. These constraints include heavy shipping traffic within the Humber, the Humber Estuary Ramsar / Special Area of Conservation (SAC) / Special Protected Area (SPA) / SSSI / Important Bird Area (IBA) and large areas of protected Annex I habitats extending from the estuary mouth inland.

44. Landfall options were initially considered within the broad AoS. However, prior to the identification of the offshore and onshore ECC AoS, a number of landfall options were discounted at an early stage due to significant environmental and engineering constraints as discussed in **Section 5.8.3**. The broad landfall AoS was therefore subsequently refined to the coastline between Skipsea and Withernsea as shown on **Panel 2** of **Figure 5-3**. Moreover, siting the landfall beyond Skipsea and Withernsea would also require either an offshore or onshore ECC that would be excessively long, and therefore greater construction impacts on the environment and communities, when shorter viable alternatives exist.

45. The key environmental constraints considered to discount the coastline between Scarborough and Skipsea included the Flamborough Headland Heritage Coast, Flamborough Head SAC, Flamborough and Filey Coast SPA and the protected Annex I Smithic Sandbank (an indicative location of the sandbank is shown on **Panel 2** of **Figure 5-3**). Interactions with other planned infrastructure, such as the offshore export cables of Dogger Bank A & B, Dogger Bank South and Hornsea Four Offshore Wind Farms and Eastern Green Link 2, would also result in complex nearshore cable crossings during construction.





Panel 1:
- Broad Landfall Area of Search
- UK Territorial Waters Limit

Key Constraints
- Humber Estuary Special Protection Area
- Humber Estuary Special Area of Conservation
- Humber Estuary Ramsar
- Site of Special Scientific Interest (SSSI)
- Landscape Designations (National Parks and Heritage Coasts)

Panel 2:
- Broad Landfall Area of Search
- Refined Landfall Area of Search
- UK Territorial Waters Limit

Key Constraints
- Site of Special Scientific Interest (SSSI)
- Flamborough and Filey Coast Special Protection Area
- Flamborough Head Special Area of Conservation
- Annex I Smithic Sandbank
- Other Existing and Planned Energy Infrastructure
- Offshore Oil and Gas Pipelines

Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Landfall - Areas of Search

Figure:	Drawing No:
5-3	PC6250-RHD-XX-ON-DR-GS-0171

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02	20/05/2025	JH	AB	A3	1:600,000
01	06/01/2025	JH	AB	A3	1:600,000

Co-ordinate system: WGS 1984 UTM Zone 31N

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46. The key environmental constraints considered to discount the coastline between Withernsea and the Humber Estuary included the Dimlington Cliff and the Lagoons SSSIs and the Spurn Heritage Coast. Interactions with existing infrastructure, such as the offshore export cables and wind turbines of Humber Gateway and Westermost Rough Offshore Wind Farms and offshore pipelines originating from the Dimlington Gas Terminal, and the planned Humber Carbon Capture, Storage and Pipelines development would result in complex nearshore cable and pipeline crossings during construction.

5.8.2 Site Selection Principles and Engineering Assumptions

47. The technical feasibility of a landfall location depends on the availability of physical space onshore to locate a landfall construction compound and the permanent infrastructure and whether the drill length for trenchless installation would be achievable.

48. As the offshore and onshore export cables connect at the landfall, constraints immediately landward and seaward of the landfall were also evaluated to determine the feasibility of onwards routeing of the offshore and onshore export cables. An unconstrained nearshore area is required to allow landfall cable installation vessels to approach the shore and maintain appropriate separation distances from existing offshore infrastructure.

49. A key engineering principle was to avoid coastal areas with a cliff height over 30m. Based on previous project experiences, cliffs above this height would limit the export cable ampacity due to associated burial depth. Ampacity refers to the maximum current, in amperes, that a conductor can carry continuously without exceeding its temperature rating. This would constrain the power output of the wind farm and the Project's economic viability. Significant cliff height may also create installation challenges for trenchless methods and cable pulling.

50. The following site selection principles were used during landfall identification as far as practicable:

- Avoiding coastal areas with a cliff height over 30m;
- Avoid and minimise impacts to internationally and nationally designated ecological sites (e.g. SAC, SPA, SSSI and Marine Conservation Zones (MCZs));
- Avoid and minimise impacts to landscape / seascape and cultural heritage designations (e.g. National Landscapes and Heritage Coasts);
- Ensure sufficient inland space to accommodate setback from the coast to reduce risks associated with coastal erosion;
- Avoid known areas of contaminated land risk, including authorised and historic landfills;
- Avoid stand-alone residential properties, urban settlements and other areas with substantial infrastructure (e.g. golf courses and holiday and caravan parks); and
- Minimise the number of nearshore cable and pipeline crossings with respect to offshore export cable routeing to the landfall.

5.8.3 Identification of Landfall Long List Options and BRAG Assessment

51. A total of 21 landfall options, illustrated on **Panel 1** of **Figure 5-4,** were identified within the broad landfall AoS. Following an initial review of environmental and engineering constraints, 14 of the landfall options were discounted for the reasons outlined in **Table 5-4** and shown on **Panel 2** of **Figure 5-4**.

52. The seven remaining landfall options were used to define the refined landfall AoS and included in the long list taken forward to the BRAG assessment as shown on **Panel 3** of **Figure 5-4**.

Panel 1

Panel 2

Panel 3

N

0 5 10 20 Kilometres

Panel 1:
- Broad Landfall Area of Search
- Initial Landfall Options

Panel 2:
- Broad Landfall Area of Search
- Refined Landfall Area of Search
- Landfall Options Excluded at Long Listing Stage
- Landfall Options Taken Forward at Long Listing Stage

Key Constraints
- Flamborough Head Special Area of Conservation
- Flamborough and Filey Coast Special Protection Area
- Site of Special Scientific Interest (SSSI)
- Annex I Smithic Sandbank
- Other Existing and Planned Energy Infrastructure
- Offshore Oil and Gas Pipelines
- Offshore Mining Sites
- Military Practice and Exercise Areas
- Marine Foul Ground

Panel 3:
- Refined Landfall Area of Search
- Landfall Long List Options

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Landfall - Long List Options

Figure: 5-4

Drawing No: PC6250-RHD-XX-ON-DR-GS-0171

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Co-ordinate system: British National Grid

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Table 5-4 Summary of Landfall Long Listing Decisions

Landfall Option	Decision and Rationale
LF1	**Excluded** due to: • Cliff height above 30m; • Unavoidable overlap with the Cayton, Cornelian and South Bays SSSI and Hundale Potash Offshore Minerals Mining Site; • Unavoidable overlap with Tenant Cliffs Common Land, which may require complex land agreement procedures; • Challenges with onwards onshore export cable routeing due to proximity to residential properties.
LF2	**Excluded** due to: • Cliff height above 30m; • Unavoidable overlap with the Cayton, Cornelian and South Bays SSSI, Gristhorpe Bay SSSI and Hundale Potash Offshore Minerals Mining Site; • Unavoidable overlap with Tenant Cliffs Common Land, which may require complex land agreement procedures; • Proximity to Flamborough and Filey Coast SPA which may present challenges to the construction programme due to potential seasonal restrictions.
LF3	**Excluded** due to: • Cliff height above 30m; • Challenges with onwards onshore export cable routeing due to proximity to residential properties and an approved planning application for a holiday park; and • Proximity to Flamborough and Filey Coast SPA which may present challenges to the construction programme due to potential seasonal restrictions.
LF4	**Excluded** due to: • Cliff height above 30m; and • Unavoidable overlap with Flamborough and Filey Coast SPA.
LF5	**Excluded** due to: • Unavoidable overlap with Hornsea Four infrastructure which limit the availability of physical space for landfall and offshore export cable infrastructure; • Challenges with onwards offshore export cable routeing due to nearshore crossings with Dogger Bank A & B offshore export cables and Annex I Smithic Sandbank; and • Challenges with onwards onshore export cable routeing due to interactions with Fraisthorpe Onshore Wind Farm.
LF6	**Excluded** due to challenges with onwards offshore export cable routeing due to nearshore crossings with Hornsea Four and Dogger Bank A & B offshore export cables and Annex I Smithic Sandbank.
LF7	
LF8	**Excluded** due to: • Unavoidable overlap with Dogger Bank South infrastructure which limit the availability of physical space for landfall and offshore export cable infrastructure; • Challenges with onwards onshore export cable routeing due to proximity to residential properties.
LF9	**Taken forward to the BRAG assessment**
LF10	**Excluded** due to challenges with onwards onshore export cable routeing due to interactions with Atwick Gas Storage Facility.
LF11	**Taken forward to the BRAG assessment**
LF12	**Taken forward to the BRAG assessment**
LF13	**Taken forward to the BRAG assessment**
LF14	**Excluded** due to: • Unavoidable overlap with Cowden Royal Air Force (RAF) Practice and Exercise Area (PEXA); • Challenges with onwards offshore cable export routeing due to interactions with marine foul ground.
LF15	
LF16	
LF17	**Taken forward to the BRAG assessment**
LF18	**Taken forward to the BRAG assessment**
LF19	**Taken forward to the BRAG assessment**
LF20	**Excluded** due to challenges with onwards offshore export cable routeing due to nearshore crossings with Westermost Rough and Humber Carbon Capture, Storage and Pipelines.
LF21	**Excluded** due to: • Unavoidable overlap with Dimlington Cliffs SSSI; • Challenges with onwards offshore export cable routeing due to nearshore crossings with Westermost Rough, Humber Carbon Capture, Storage and Pipelines and offshore pipelines from the Dimlington Gas Terminal.

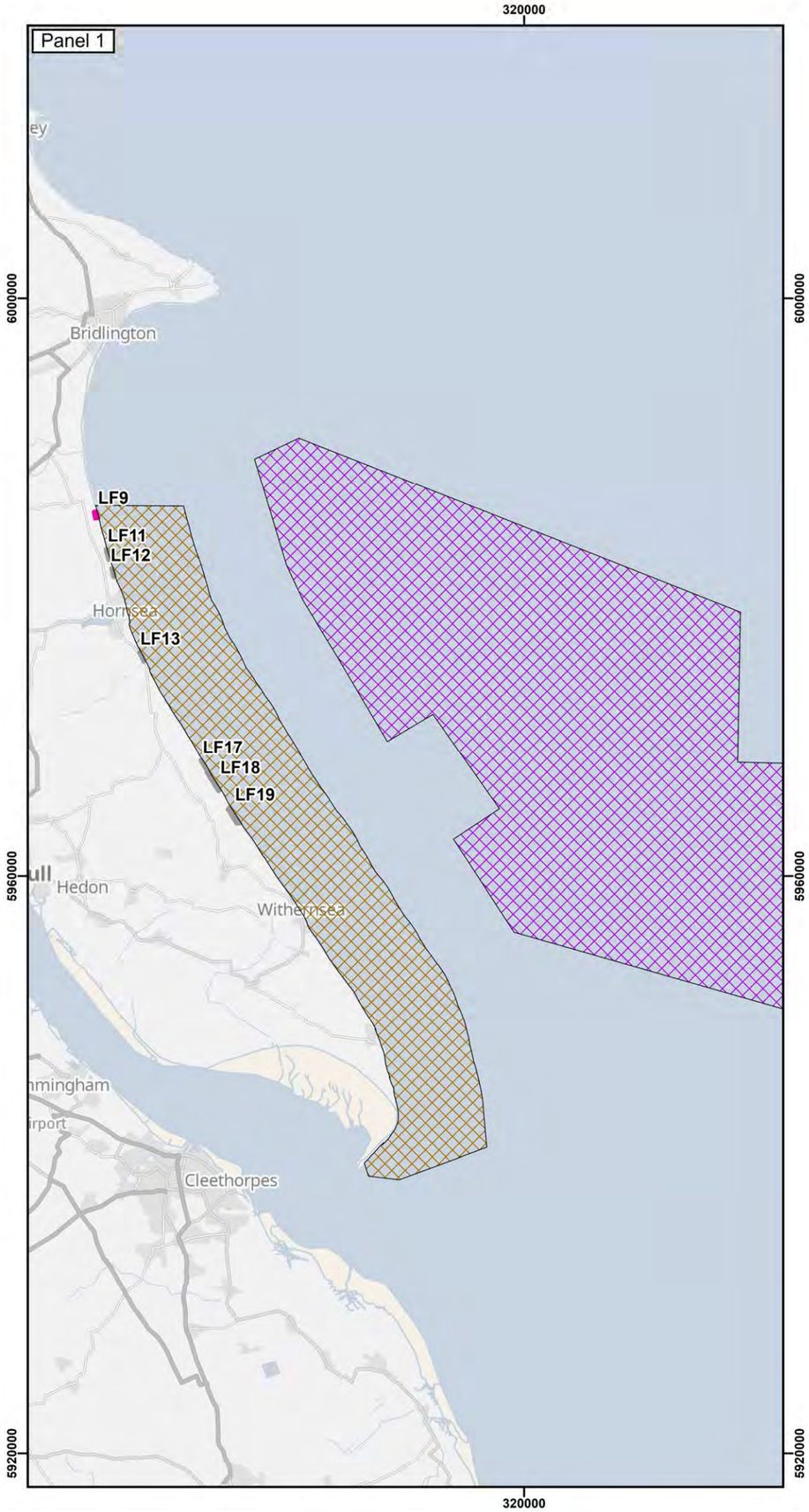
5.8.5 Identification of the Preferred Landfall Option for Scoping

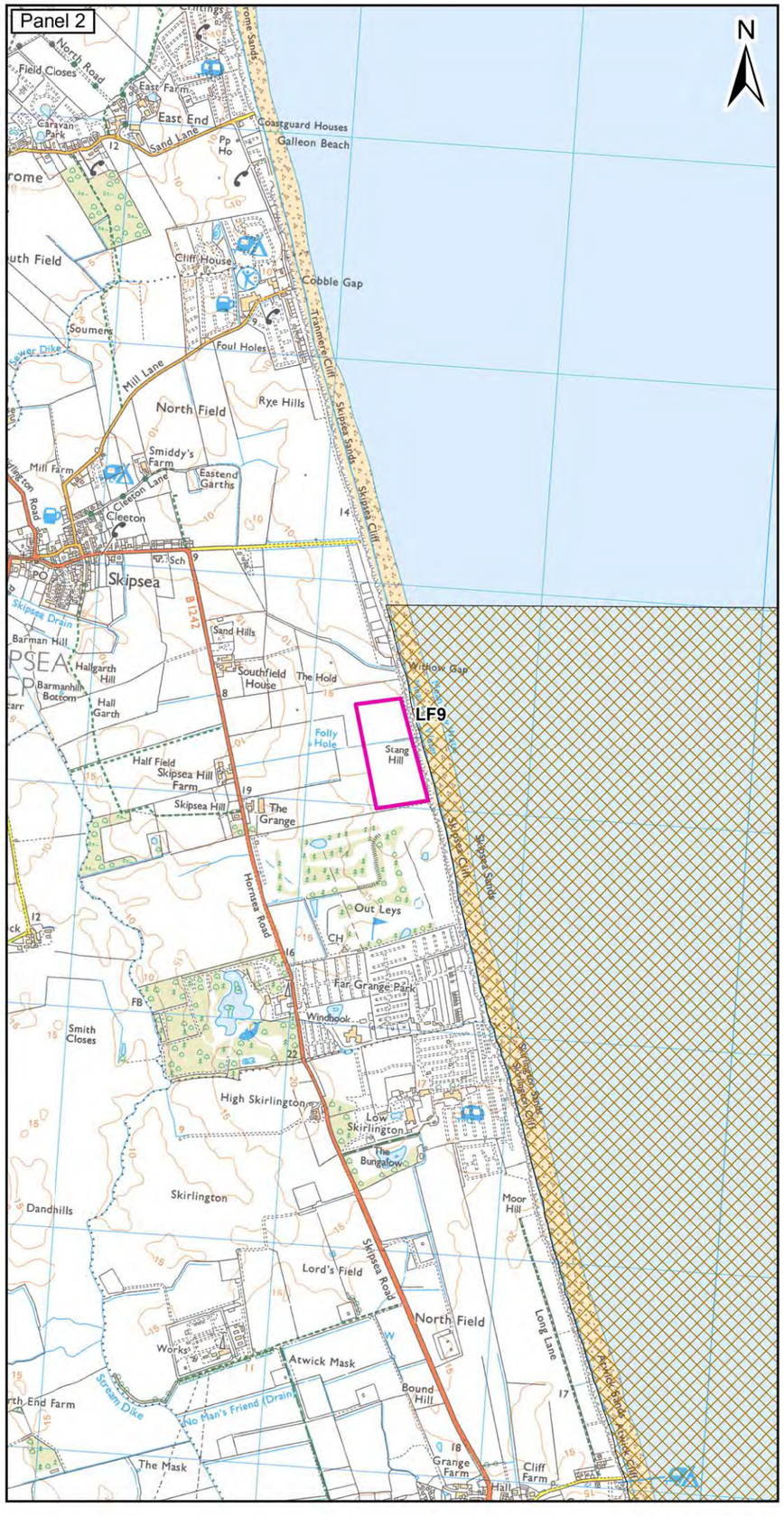
53. **Table 5-5** summarises the reason for discounting six out of the seven preferred options based on the BRAG assessment outcomes (as shown on **Panel 1** of **Figure 5-5**). Most of the landfall options were considered to have comparable environmental and engineering risks.

54. However, landfall LF9 was the only option which provided an opportunity to potentially avoid or minimise impacts to the Holderness Inshore MCZ and Holderness Offshore MCZ through sensitive landfall design and micro-siting of the offshore ECC during the refinement stage. Therefore, LF9 was selected as the preferred landfall option as shown on **Panel 2** of **Figure 5-5**.

Table 5-5 Summary of Landfall Preferred Option Decisions

Landfall Option	Decision and Rationale
LF9	**Selected as the preferred option** due to: • Suitable cliff height; • Low onshore environmental and engineering risks; and • Location on the northern edge of the Holderness Inshore MCZ and Holderness Offshore MCZ designations, therefore minimal overlap, which provides avoidance and mitigation opportunities to be considered through the EIA and further design refinements.
LF11	**Excluded** due to: • Challenges with onwards onshore export cable routeing due to interactions with Atwick Gas Storage Facility; • Unfavourable ground conditions considered to have a high risk of drilling fluid frac-out and bore collapse; and • Location further within the Holderness Inshore MCZ and Holderness Offshore MCZ designations, precluding the ability to avoid offshore export cable routeing through these sites.
LF12	**Excluded** due to: • location further within the Holderness Inshore MCZ and Holderness Offshore MCZ designations, precluding the ability to avoid offshore export cable routeing through these sites. • LF9 provides a more favourable alternative to potentially avoid and minimise impacts to the MCZ.
LF13	
LF17	**Excluded** due to: • Challenges with onwards onshore export cable routeing due to interactions with Aldbrough Gas Storage Facility; • High potential for buried archaeology based on a World War II training camp identified previously; and • Location further within the Holderness Inshore MCZ and Holderness Offshore MCZ designations, precluding the ability to avoid offshore export cable routeing through these sites.
LF18	**Excluded** due to: • Challenges with onwards onshore export cable routeing due to interactions with the Aldbrough Hydrogen Storage and Aldbrough Hydrogen Pathfinder planned developments; • High potential for buried archaeology based on a World War II observation post and Roman signal station and enclosure identified previously; and • Location further within the Holderness Inshore MCZ and Holderness Offshore MCZ designations, precluding the ability to avoid offshore export cable routeing through these sites.
LF19	**Excluded** due to: • Unfavourable construction access, requiring significant traffic modification works. • Location further within the Holderness Inshore MCZ and Holderness Offshore MCZ designations, precluding the ability to avoid offshore export cable routeing through these sites.





Panel 1:

- Landfall Preferred Option
- Landfall Options Excluded following Short Listing Stage

Key Constraints

- Holderness Inshore Marine Conservation Zone
- Holderness Offshore Marine Conservation Zone

Panel 2:

- Landfall Preferred Option

Key Constraints

- Holderness Inshore Marine Conservation Zone

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Landfall - Preferred Option

Figure:	Drawing No:				
5-5	PC6250-RHD-XX-ON-DR-GS-0172				
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Co-ordinate system: WGS 1984 UTM Zone 31N

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5.8.6 Refinement of the Preferred Landfall Option for PEIR

55. A landfall feasibility assessment was undertaken on the preferred landfall option (LF9) to further evaluate environmental and engineering constraints to landfall cable installation works and determine a preliminary landfall design. Two trenchless installation trajectories have been considered, which comprise a perpendicular option that exits within the Holderness Inshore MCZ and a slightly longer, angled option that exits north-east of the MCZ designation. At this stage, further engineering design and evaluation of feasibility, as well as consideration of potential coordination with other developers, are ongoing, as such complete avoidance of the Holderness Inshore MCZ cannot be guaranteed. Therefore, the worst-case option detailed in the Project Design Envelope, as discussed in **Chapter 4 Project Description**, cannot be excluded.

56. Coastal erosion modelling was also conducted at LF9 to ensure that once installed, the landfall infrastructure would remain resilient and not exposed or damaged by coastal retreat. Historical erosion rates and climate change projections were used to determine the appropriate setback distance from the coast to site the landfall construction compound (see **Chapter 8 Marine Physical Processes** for further details on the current and projected coastal erosion rates and **Chapter 31 Climate Change** for details on climate change resilience measures embedded into the project design).

57. The Onshore Development Area includes sufficient space at the landfall to accommodate flexibility to micro-site the landfall construction compound, accounting for both trenchless installation trajectories and coastal erosion setback. The indicative location of the landfall construction compound is identified on **Figure 4-2** in **Chapter 4 Project Description**. The Offshore and Onshore Development Areas also widen at the landfall to allow necessary flexibility for onwards routeing of the offshore and onshore export cables. The Offshore and Onshore Development Areas extend up to Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS) respectively and overlap in the intertidal zone.

5.9 Offshore Export Cable Corridor

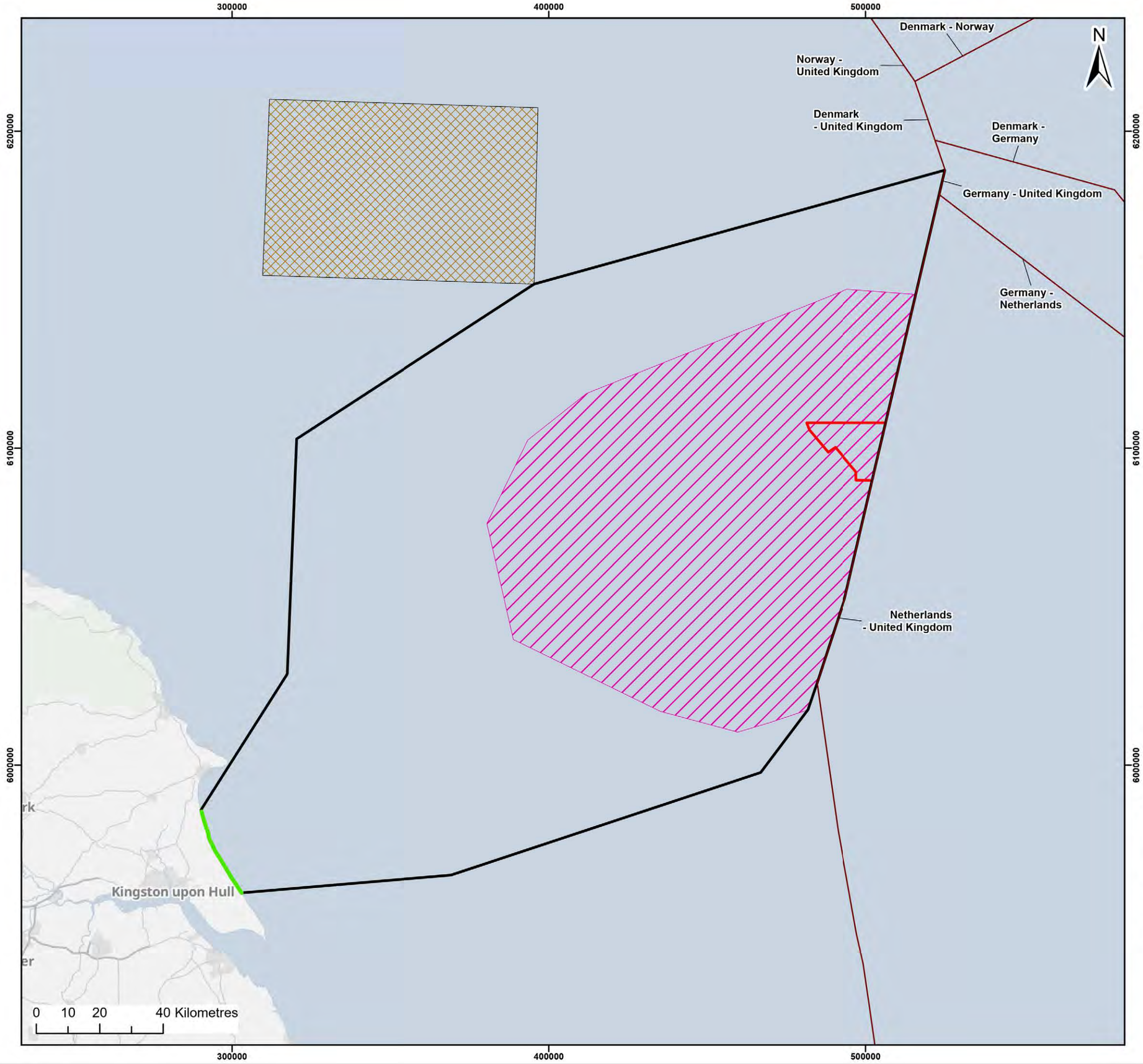
58. This section describes the site selection process for the offshore ECC from the Array Area to the landfall.

5.9.1 Defining the Offshore Export Cable Corridor Area of Search

59. The most important factor in determining the offshore ECC AoS was to ensure that the area provided flexibility to capture the most feasible routes from the Array Area to landfall (illustrated in **Figure 5-6**). The southern extent of the offshore ECC AoS was established from the southern edge of the refined landfall AoS to the south-eastern corner of the Dogger Bank SAC within UK territorial waters. The southern AoS extent ran slightly setback from the southern edge of the Dogger Bank SAC to allow potential offshore ECCs to exit the Dogger Bank SAC from the south and then travel west to the landfall.

60. The northern extent of the offshore ECC AoS was defined as from the northern edge of the refined landfall AoS to the south-eastern corner of the Swallow Sand MCZ, then parallel to the northern boundary of the Dogger Bank SAC to the boundary between the German EEZ. A significant buffer was established between the northern edge of the Dogger Bank SAC and the offshore ECC AoS due to a potential Dogger Bank SAC extension (outlined in the paragraph below).

61. It is understood that the Department for Environment, Food and Rural Affairs (Defra) is currently looking to identify potential areas for new Marine Protected Area (MPA) designations, or extensions to existing designations, to provide compensation for loss to and disturbance of benthic habitats. There is uncertainty at this stage of the Project about whether Dogger Bank SAC will be identified as a potential site for extension and in the event that the Dogger Bank SAC is selected there is further uncertainty on the extent and direction where any extension may occur. It is considered that if an extension to the Dogger Bank SAC is taken forwards, an extension would most likely be to the north of the existing site. This is based upon the Dogger Bank Selection Assessment Document (JNCC, 2011) which identified the sandbank extended further to the north of the SAC boundary, as well as and further recommendation in RWE (2024). Furthermore, the assumption has also been based on the identified macrofaunal and infaunal communities from historic benthic surveys (Wieking and Kröncke, 2003; and RWE, 2024), which provided the best available indication of the extent of the sandbank feature. The Applicant therefore included a significant buffer to the north of the existing Dogger Bank SAC to provide flexibility in the event of a future extension. The offshore ECC AoS used to identify the potential offshore ECC options for the long list is shown on **Figure 5-6**.



Legend:

- Dogger Bank D Array Area
- Offshore Export Cable Corridor Area of Search
- Refined Landfall Area of Search
- World Maritime Boundaries

Key Constraints

- Dogger Bank Special Area of Conservation
- Swallow Sand Marine Conservation Zone

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Onshore Export Cable Corridor - Area of Search

Figure: 5-6

Drawing No: PC6250-RHD-XX-OF-DR-GS-0173

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Co-ordinate system: WGS 1984 UTM Zone 31N

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5.9.2 Site Selection Principles and Engineering Assumptions

62. The offshore ECC options were identified as 3km wide corridors from the Array Area which connect into the seven landfall options taken forward at the long list stage (**Section 5.9.3**), which was considered sufficient width to refine down the options at a later stage of the site selection process, whilst accommodating potential temporary construction areas within the offshore ECC options. The primary objective of the offshore ECC routeing exercise was to minimise both the total route length from the Array Area to the landfall options as well as any environmental and engineering limitations on those routes.

63. In addition to the guidance outlined in **Table 5-1**, the offshore ECC routeing exercise considered the following guidance:

- The Crown Estate (2022) A Guide to Habitats Regulations Assessment (HRA) for Offshore Wind Leasing Round 4 (document reference: 38255-TCE-DOC-05);
- The Crown Estate (2021b) Cable Route Identification & Leasing Guidelines: Appendix 1 Cable Route Protocol.

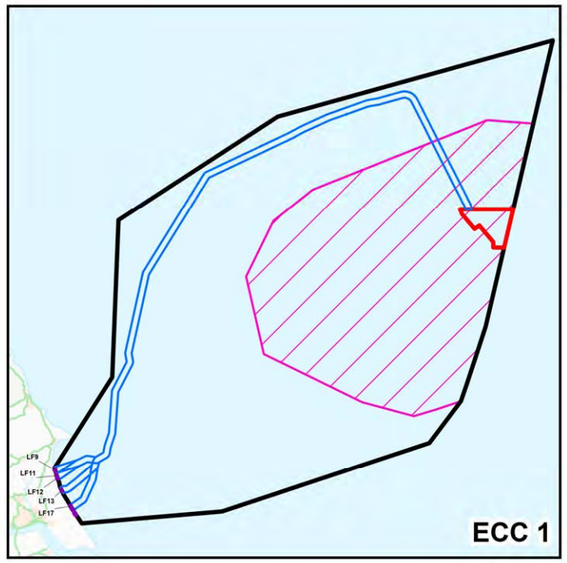
64. A set of potential offshore ECC options were developed within the offshore ECC AoS using the following engineering and environmental site selection principles, as far as reasonably practicable:

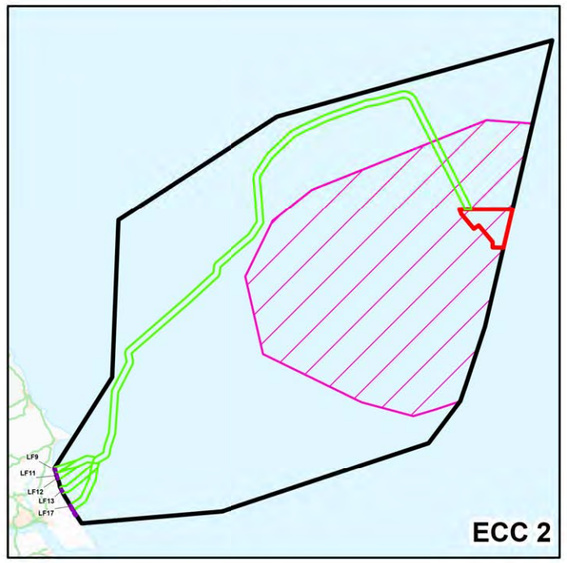
- Minimise the total length of the offshore ECC (to reduce cost and potential transmission losses);
- The separation distance from offshore export cables of other projects in the nearshore region was established as a minimum of 150m. This distance was selected as it was sufficient to accommodate anchoring and installation requirements. The final separation distances with other projects will be determined through proximity agreements with the relevant parties;
- Avoid, but where not possible, minimise the number of crossings of existing offshore cables, pipelines and wells. Where crossing is required, cables and pipelines should be crossed at a 90° where possible (crossings < 90° are considered unfavourable);
- Avoid, but where not possible, minimise interactions with other existing offshore wind farms / AfL area;
- Avoid, but where not possible. minimise interactions with other offshore infrastructure through a 500m buffer to be applied to offshore cables and pipelines. This principle is more applicable further offshore as it is difficult to adhere to this buffer in the busier nearshore region;
- Avoid any known areas of high Unexploded Ordnance (UXO) concentration, firing ranges and other Military Practice and Exercise Areas (PEXA);
- Avoid, but where not possible minimise, interaction with areas thought to be of hard substrate where cable burial may be difficult to achieve. The British Geological Survey (BGS) 1:250,000 seabed sediments data source was used to inform this principle in the absence of any site-specific geophysical or geotechnical data;
- Maintain sufficient space within the corridor for the installation of the offshore export cables (including the anchor spread of installation vessels), whilst maintaining an appropriate safety buffer with existing or planned infrastructure;
- Avoid wrecks designated under the Protection of Wrecks 1973 (as amended) and minimise interactions with other wrecks or features of archaeological importance;
- Avoid, but where not possible minimise, direct impacts to sites designated for nature conservation (SACs, SPAs and MCZs), recognising that it is not possible to completely avoid this on account of the location of the Project within the Dogger Bank SAC;
- Avoid, but where not possible, minimise impacts to Annex 1 features (such as potential reefs and sandbank habitats that are not formally designated as an SAC such as Smithic Bank);
- Avoid aggregate dredging areas, foul ground and disposal sites;
- Avoid, but where not possible, minimise interaction with major shipping lanes; and
- Avoid, but where not possible, minimise interaction with areas of high fishing activity.

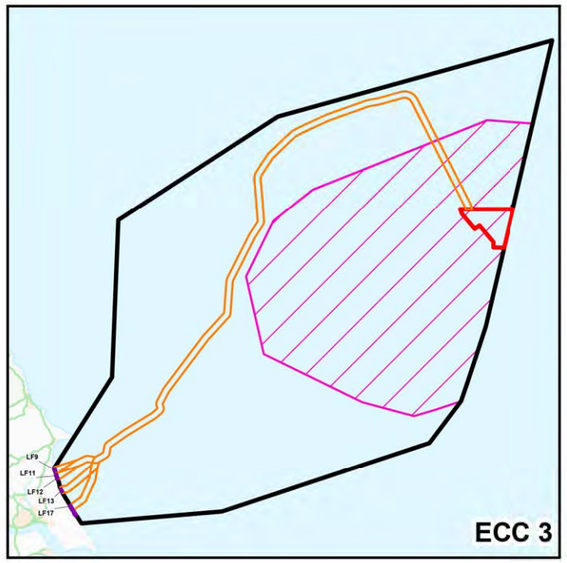
5.9.3 Identification of Offshore Export Cable Corridor Long List Options and BRAG Assessment

65. A total of 14 offshore ECC options, each 3km in width, were identified within the offshore ECC AoS which connected into the seven landfall options identified in **Section 5.8.5**. These options were routed by applying the engineering and environmental site selection principles described in **Section 5.9.2**. The full long list of options is provided in **Figure 5-7**.

66. Seven of the 14 offshore ECC options start from the north of the Array Area (options 1 to 7, **Sheet 1** of **Figure 5-7**), and the remaining seven options from the south (options 8 to 14, **Sheet 2** of **Figure 5-7**). The northern options have a greater total route length, however for these options the offshore ECC length within the Dogger Bank SAC is shorter (approximately >100km for the southern routes, but approximately 35km for the northern routes in relation to the current Dogger Bank SAC boundary). Additionally, offshore ECC options 1 to 3 extend significantly further north than the current SAC boundary. These options were included as potential mitigative options which seek to minimise routing through a potential future extension to the Dogger Bank SAC discussed in **Section 5.9.1**.





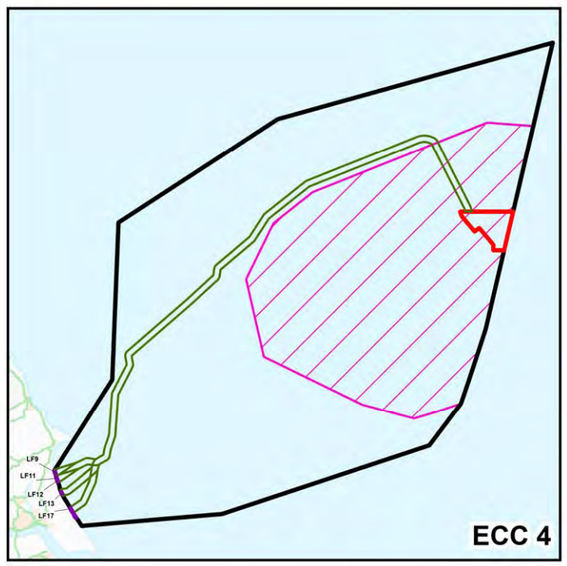


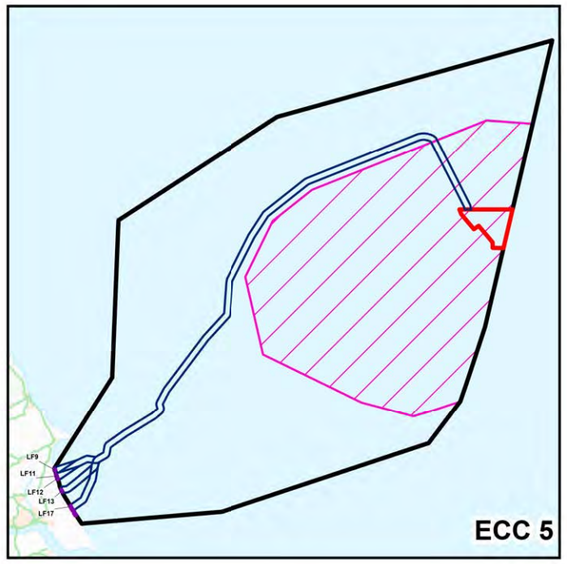
Legend:

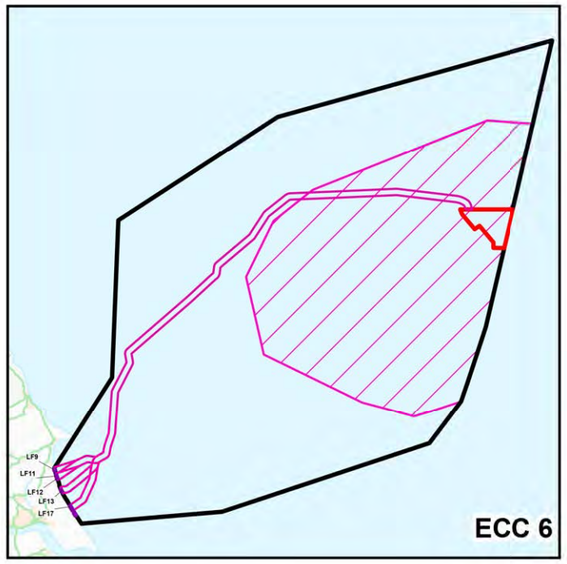
- Dogger Bank D Array Area
- Landfall Long List Options
- Offshore Export Cable Corridor Area of Search
- Dogger Bank Special Area of Conservation

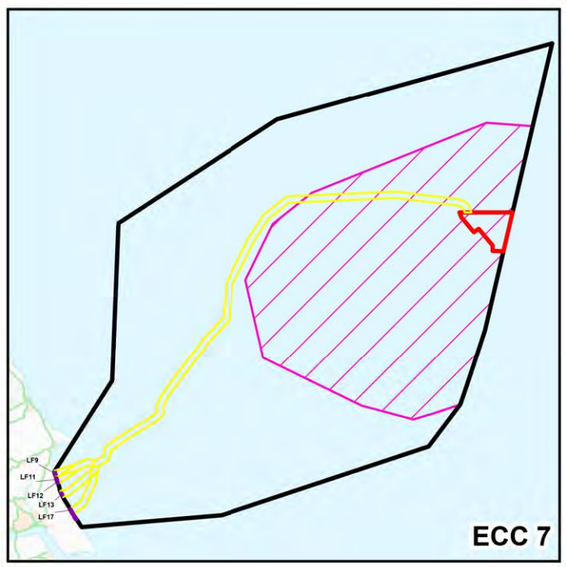
Offshore Export Cable Corridor Long List Options

- Offshore ECC 1
- Offshore ECC 2
- Offshore ECC 3
- Offshore ECC 4
- Offshore ECC 5
- Offshore ECC 6
- Offshore ECC 7









N

0 20 40 80 Kilometres

Source: © Haskoning DHV UK Ltd, 2024; © Natural England, 2024; © OpenStreetMap (and) contributors, CC-BY-SA

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Offshore Export Cable Corridor - Long List Options - Sheet 1 of 2

Figure: 5-7

Drawing No: PC6250-RHD-XX-OF-DR-GS-0174

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	20/05/2025	JH	AB	A3	1:1,000,000
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Co-ordinate system: WGS 1984 UTM Zone 31N

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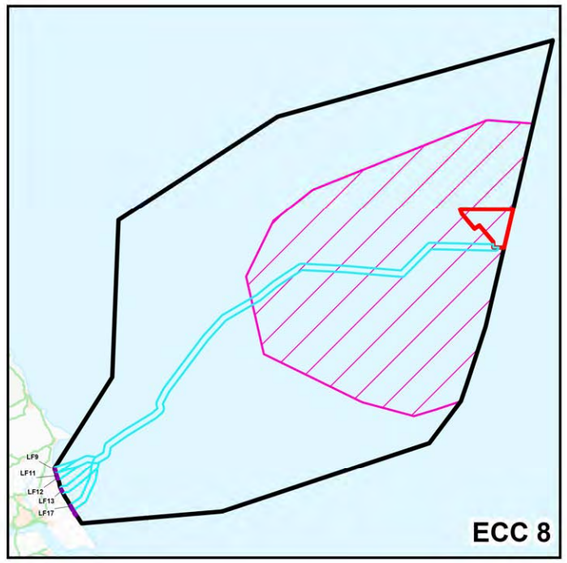
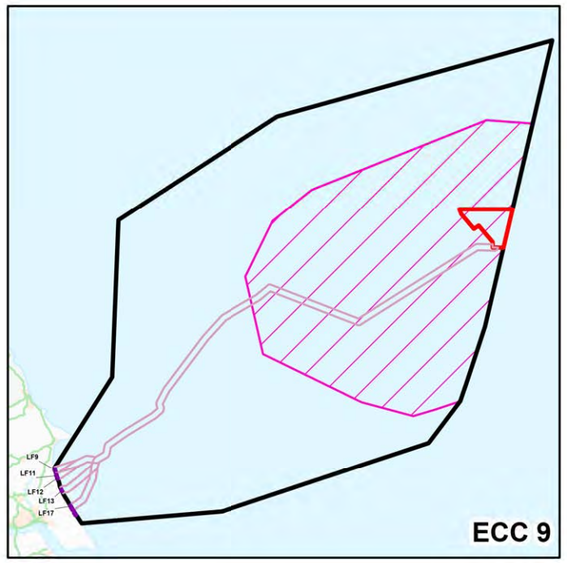
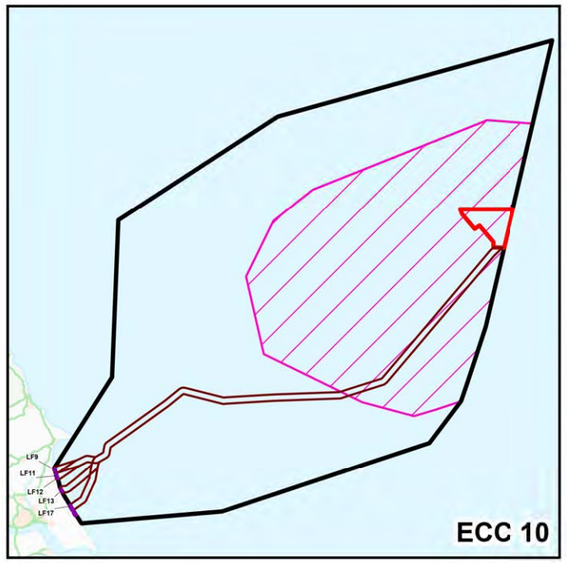




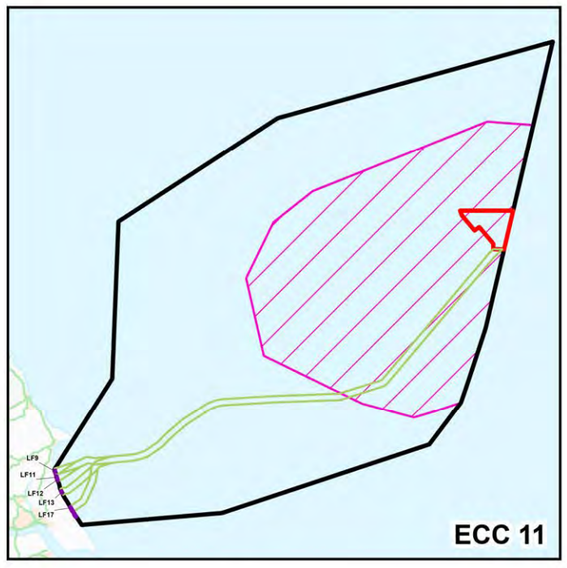


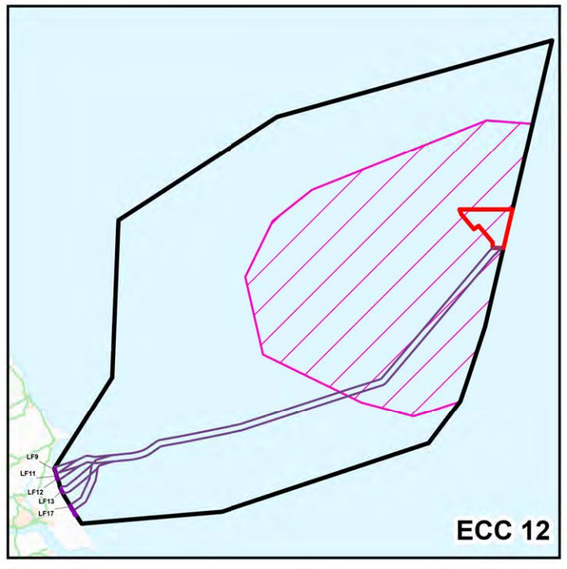
Legend:

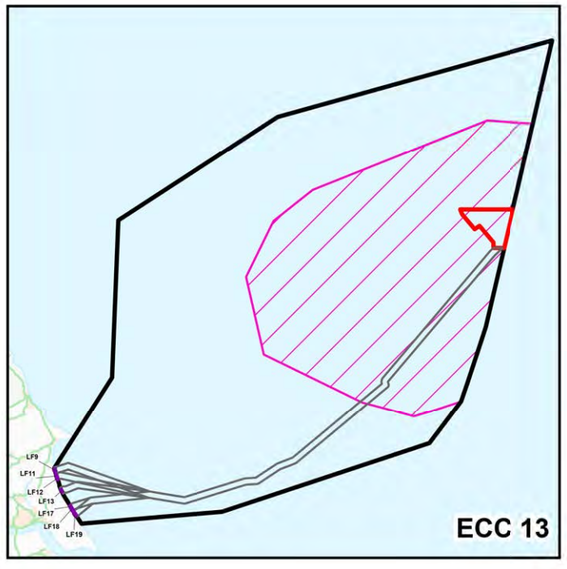
- Dogger Bank D Array Area
- Landfall Long List Options
- Offshore Export Cable Corridor Area of Search
- Dogger Bank Special Area of Conservation

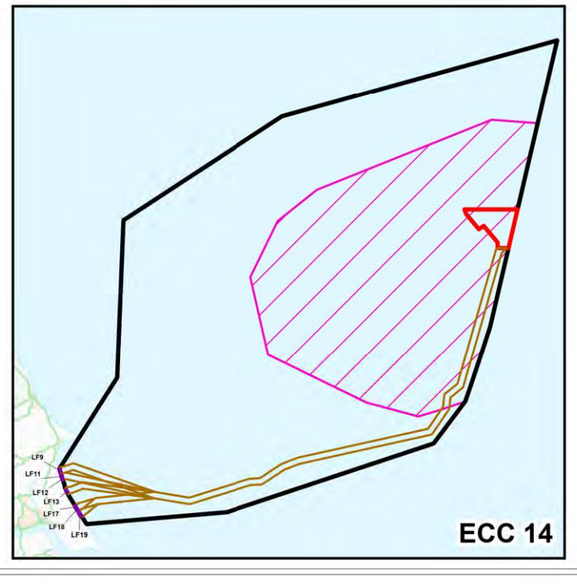
Offshore Export Cable Corridor Long List Options

- Offshore ECC 8
- Offshore ECC 9
- Offshore ECC 10
- Offshore ECC 11
- Offshore ECC 12
- Offshore ECC 13
- Offshore ECC 14









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0 20 40 80 Kilometres

Project:

Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Offshore Export Cable Corridor - Long List Options
- Sheet 2 of 2

Figure: 5-7

Drawing No: PC6250-RHD-XX-OF-DR-GS-0174

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	20/05/2025	JH	AB	A3	1:1,000,000
01	06/01/2025	JH	AB	A3	1:1,000,000

Co-ordinate system: WGS 1984 UTM Zone 31N

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67. As the 14 offshore ECC options approach the nearshore region (approximately 25km offshore), they each diverge to route into the potential landfall options. It was not considered feasible to route offshore ECC options 1 to 12 into the LF18 and 19 as it would require those routes to travel a significant distance parallel to the coast, within the Holderness Inshore MCZ. Therefore, only offshore ECC options 13 and 14 route into LF18 and LF19.

68. Although best endeavours were made in this routeing exercise to adhere to the environmental and engineering constraints outlined above, it was not always possible to satisfy each criterion. However, the conservative 3km width of the options at this stage is considered sufficient to accommodate route changes and potential micro-siting where required at a later stage.

69. Following a review of the environmental and engineering constraints against the offshore ECC routes illustrated in **Figure 5-7**, all 14 options were taken forward for consideration in the BRAG assessment and are discussed in more detail in **Section 5.9.4**.

5.9.4 Identification of Offshore Export Cable Corridor Short List Options for Scoping

70. The BRAG assessment of the 14 offshore ECC options concluded in a major refinement of the options for consideration. A total of 11 offshore ECC options were discounted, with the remaining three forming the short list (the reasons for which are outlined in **Table 5-6**). Advice from engineering, environmental and legal experts was sought, considered and weighed against each other during this decision-making process.

71. At the EIA scoping stage, the Offshore Scoping Area (Royal HaskoningDHV, 2024) was defined as a broad area to accommodate these short listed offshore ECC options and allow flexibility for further site selection refinement post-scoping.

Table 5-6 Summary of Offshore ECC Short Listing Decisions

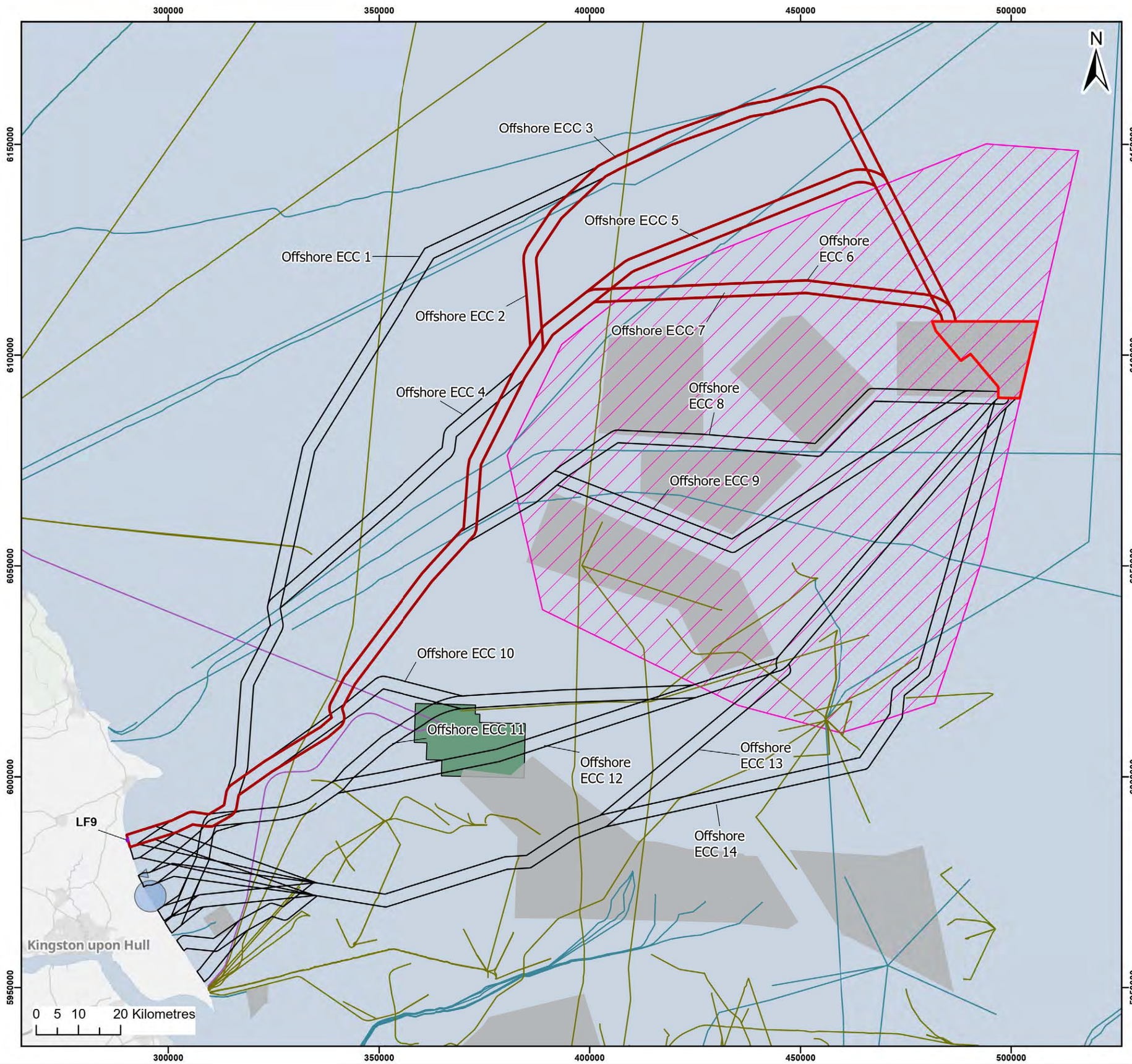
Offshore ECC Option	Decision and Rationale
All options via the western region of the offshore ECC AoS (offshore ECC options 1, 2, 4 and 6)	**Excluded** due to: • Significant portion of route is through areas of hard substrate (as identified by BGS), creating difficulty in achieving full cable burial and increasing likelihood of external protection; and • Adjacent to Breagh Alpha platform and overlap of five wells within the offshore ECC options.
All options via the south of the Array Area (offshore ECC options 8 to 14)	**Excluded** due to: • Significantly longer cable routeing through the Dogger Bank SAC compared to Northern options (>100km); • Increased number of cable and pipeline crossings within the Dogger Bank SAC which would likely require protection measures; • Significant interaction with other infrastructure such as oil and gas wells and pipelines, offshore wind leasing areas and the planned Norther Endurance Partnership carbon capture and storage geological store; and • Difficulty in routeing offshore ECC options 13 and 14 into the short-listed landfall at LF9 due to the requirement for significant cable length within the Holderness Inshore MCZ parallel to the coast.
All remaining options (offshore ECC options 3, 5 and 7)	**Included** in short list due to: • Shorter cable route through the Dogger Bank SAC (approximately 35 to 80km) to the north of the Array Area; and • Fewer cables and pipeline crossings within the Dogger Bank SAC.

72. No additional routes were proposed between the long list and short list stage of the site selection process, however the decision to short list a single landfall at LF9 (**Section 5.8.5**) was taken into consideration here. All branches routeing to landfalls other than LF9 were discounted at this stage to account for this decision.

73. The short listed offshore ECC options are illustrated in **Figure 5-8** (**Sheet 1** of which includes discounted options and some of the site selection criteria)**,** and these were the options that formed the scoping boundary for the Project.

5.9.5 Identification and Refinement of the Preferred Offshore Export Cable Corridor Options for PEIR

74. Subsequent comparisons of environmental, engineering, and legal constraints following the short-listing process, as well as consideration of comments made through other consultation forums with SNCBs, resulted in a further refinement of the option list to take forward for PEIR. Based upon these discussions, it was decided to discount a further option (offshore ECC option 7) from consideration, leaving two remaining options (offshore ECC options 3 and 5). The justification for these decisions is summarised in **Table 5-7**. **Sheet 1** of **Figure 5-9** illustrates the excluded option and the two remaining options.



Legend:

- Dogger Bank D Array Area
- Landfall Preferred Option
- Offshore Export Cable Corridor Options Taken Forward at Short Listing Stage
- Offshore Export Cable Corridor Options Excluded at Short Listing Stage

Key Constraints

- Dogger Bank Special Area of Conservation
- Northern Endurance Partnership Pipelines
- Northern Endurance Partnership Geological Store
- Offshore Oil and Gas Pipelines
- Offshore Cables
- The Crown Estate's Offshore Wind Leasing Area
- Military Practice and Exercise Areas (PEXA)

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Offshore Export Cable Corridor - Short List Options
Page 1 of 2

Figure:	Drawing No:				
5-8	PC6250-RHD-XX-OF-DR-GS-0175				
Revision:	**Date:**	**Drawn:**	**Checked:**	**Size:**	**Scale:**
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Co-ordinate system: WGS 1984 UTM Zone 31N

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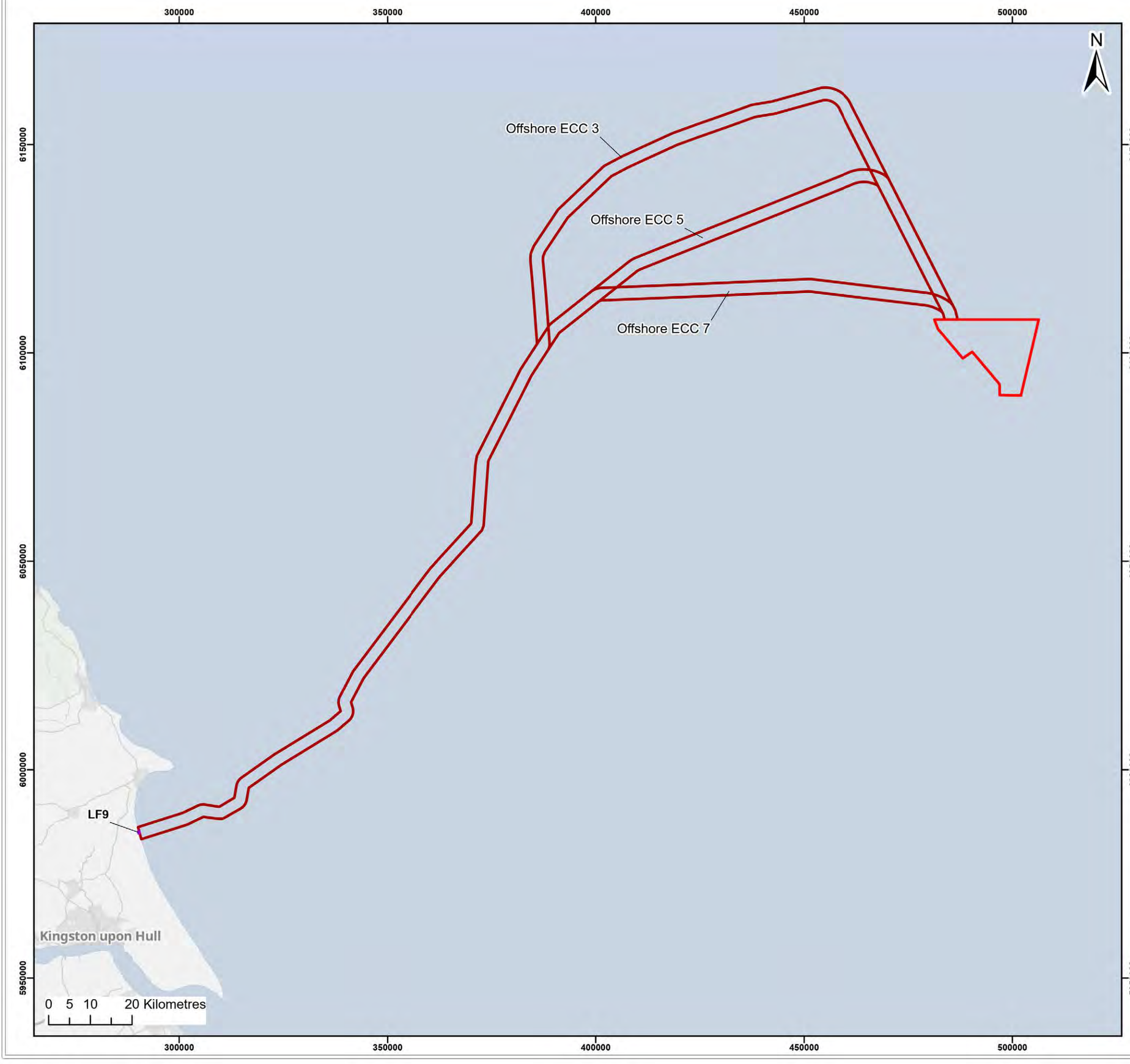

Legend:

- Dogger Bank D Array Area
- Landfall Preferred Option
- Offshore Export Cable Corridor Short List Options

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Offshore Export Cable Corridor - Short List Options
Page 2 of 2

Figure: 5-8

Drawing No: PC6250-RHD-XX-OF-DR-GS-0175

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	09/12/2024	JH	AB	A3	1:900,000

Co-ordinate system: WGS 1984 UTM Zone 31N

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Table 5-7 Summary of Offshore ECC Preferred Option Decisions for PEIR

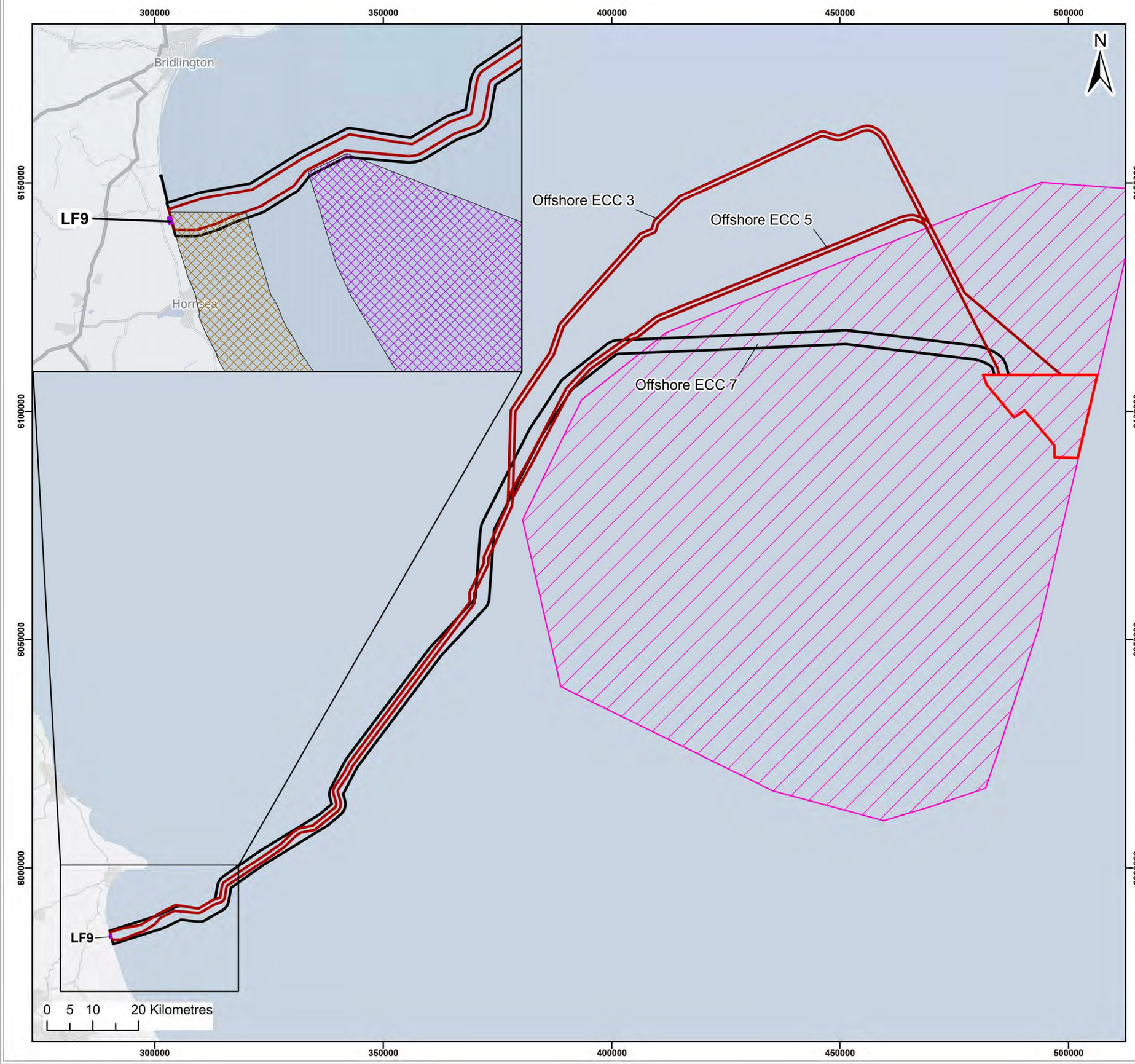
Offshore ECC Option	Decision and Rationale
Offshore ECC Option 7	**Excluded** due to: • Significantly longer cable route through the Dogger Bank SAC in comparison to other options (80km); and • Furthermore, a preliminary Cable Burial Risk Assessment identified a greater risk of rock protection being required for this option.
All remaining options (offshore ECC options 3 and 5)	**Included** as preferred offshore ECC due to: • Shorter cable route through the Dogger Bank SAC (35km) thereby minimising impacts.

75. The width of the remaining two offshore ECC options was refined down from 3km to 1km in order to minimise the route length, divert around features such as wrecks, to enable more favourable crossing angles with cables and pipelines and to minimise impacts on other marine users. During this refinement process, maximum effort was made to micro-site and minimise environmental and engineering risks as far as possible. This included the complete avoidance of the offshore Holderness MCZ, with the exception of an overlap with a construction buffer. The exit point from the Array Area was also amended to form a fan shape which provides the flexibility to minimise crossings of the inter-array cables, thereby reducing permanent protection on the seabed.

76. Whilst 1km was defined as the target width of the offshore ECC, there are sections of the route where the width exceeds this, particularly in the nearshore region. This was due to the potential for a trenchless exit point to be located outside this 1km wide corridor. Furthermore, there was a decision to partially overlap with the Dogger Bank South offshore export cable corridor (which runs parallel to the preferred options for the Project) in the nearshore to enable better coordination to potentially avoid cable routeing within the Holderness Inshore MCZ and share relevant data where possible.

77. The refined offshore ECC options 3 and 5 formed the basis upon which the Offshore Development Area was established (**Sheet 2** of **Figure 5-9**). This included the (buffered) Array Area and the two indicative offshore ECC options which demarcate the northern and southern boundaries of the potential cable route, referred to as the 'Characterisation Area'.

78. The ECC options 3 and 4 and the Characterisation Area are retained as part of the Offshore Development Area to allow a flexible approach to offshore cable routeing in this area if required. The two options have been surveyed to inform the baseline environment. The Characterisation Area is being surveyed to provide a characterisation of the offshore environment in that area and inform subsequent assessments for routeing flexibility. This was considered the most appropriate approach and agreement for retaining flexibility was received from Natural England (23rd April 2024) and agreement on the survey scope (2nd July 2024). Given the uncertainty around a potential extension to the Dogger Bank SAC further refinement would be undertaken ahead of the application should there be further clarity of any proposed site extension published by Defra. The geophysical and geotechnical survey data in this area are not available for inclusion within the PEIR assessments but will be used to inform the ES at the time of DCO application submission.



Legend:

- Dogger Bank D Array Area
- Landfall Preferred Option
- Offshore Export Cable Corridor Options Taken Forward at PEIR Refinement Stage
- Offshore Export Cable Corridor Options Excluded at PEIR Refinement Stage

Key Constraints

- Dogger Bank Special Area of Conservation

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Offshore Export Cable Corridor Refinement - Offshore Development Area for PEIR - Sheet 1 of 2

Figure: 5-9

Drawing No: PC6250-RHD-XX-OF-DR-GS-0176

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Co-ordinate system: WGS 1984 UTM Zone 31N

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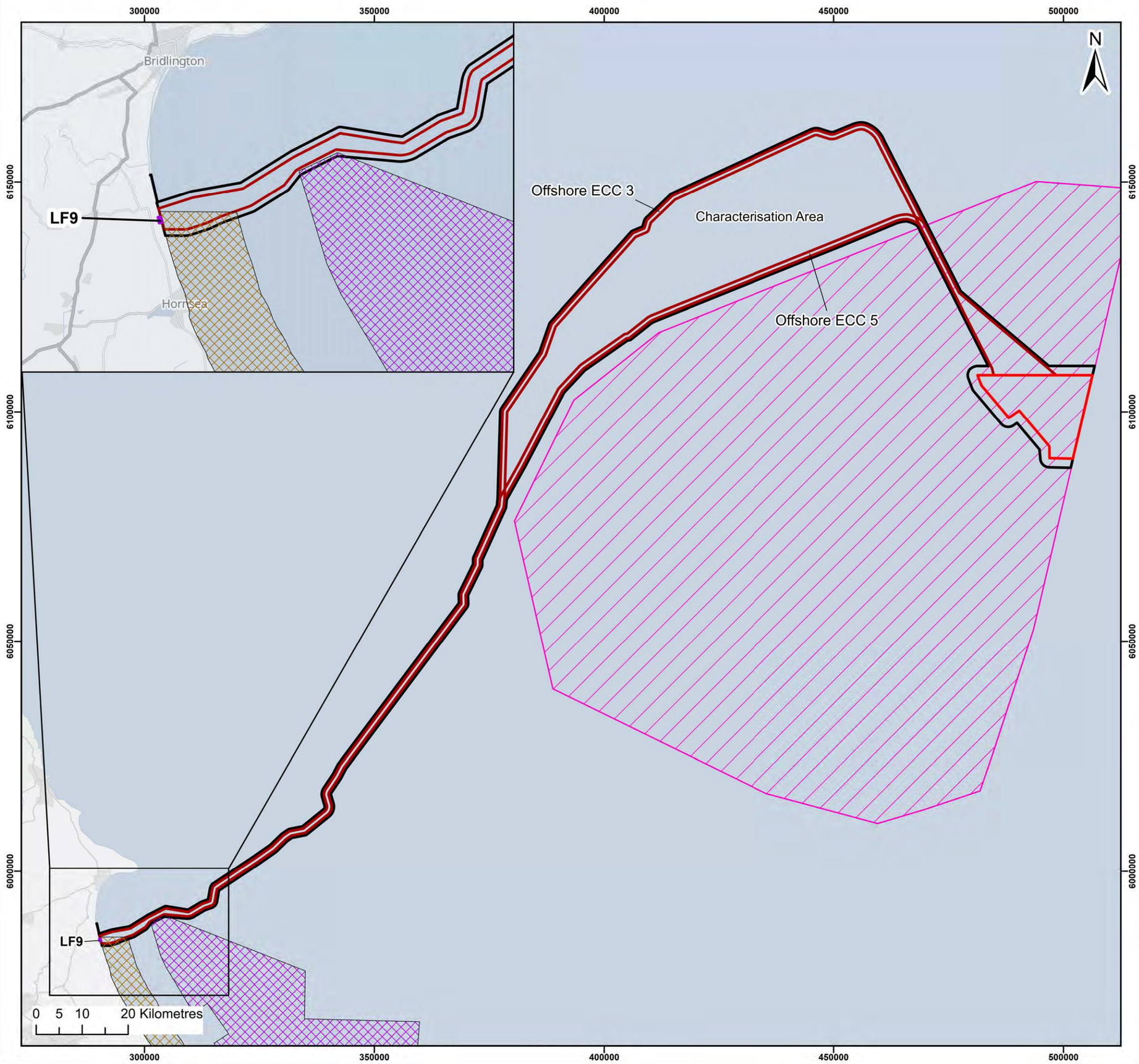

Legend:

- Dogger Bank D Array Area
- Landfall Preferred Option
- Offshore Export Cable Corridor Preferred Options
- Offshore Development Area for PEIR

Key Constraints

- Dogger Bank Special Area of Conservation
- Holderness Inshore Marine Conservation Zone
- Holderness Offshore Marine Conservation Zone

Project:
Dogger Bank D
Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Offshore Export Cable Corridor Refinement -
Offshore Development Area for PEIR
- Sheet 2 of 2

Figure: 5-9

Drawing No: PC6250-RHD-XX-OF-DR-GS-0176

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Co-ordinate system: WGS 1984 UTM Zone 31N

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5.10 Onshore Export Cable Corridor

79. This section covers the site selection process for the onshore export cables from the landfall to the OCS zone AoS. Site selection for the onshore export cables within the OCS zone AoS is discussed In **Section 5.11,** which was undertaken following the short listing of the OCS zone options.

5.10.1 Defining the Onshore Export Cable Corridor Area of Search

80. The onshore ECC AoS included land between the northern and southern boundaries of the refined landfall AoS and the OCS zone AoS and is illustrated on **Figure 5-10**. The boundaries of the onshore ECC AoS were defined to align with identifiable boundaries of physical and environmental constraints, including urban settlements, industrial areas, designated ecological and heritage sites, roads and the Hull-Scarborough railway line.

81. In addition, flexibility to route the onshore export cables into the OCS zone AoS from both the west and east was considered when defining the onshore ECC AoS. It was not feasible to route onshore export cables from the north or south of the OCS zone AoS due to the presence of Beverley, Cottingham and Hull.

5.10.2 Site Selection Principles and Engineering Assumptions

82. The onshore ECC from the landfall to the OCS zone AoS was identified to site the High Voltage Direct Current (HVDC) onshore export cables. Broad 500m wide corridors were initially identified based on the maximum corridor width required to accommodate both the temporary construction and permanent infrastructure footprint, which allowed flexibility for refinement at a later stage. A key factor for onshore export cable routeing was to determine the most direct route to the OCS zone AoS as practicable whilst minimising interactions with environmental and engineering constraints.

83. A key engineering principle was to keep the onshore ECC as straight and short as practicable, avoiding tight bends and minimising directional changes. Moreover, pinch points around concentrations of constraints at crossing points and limitations on physical space availability were reviewed to ensure technical feasibility of the onshore ECC options identified.

84. The following site selection principles were used during onshore ECC routeing as far as practicable:

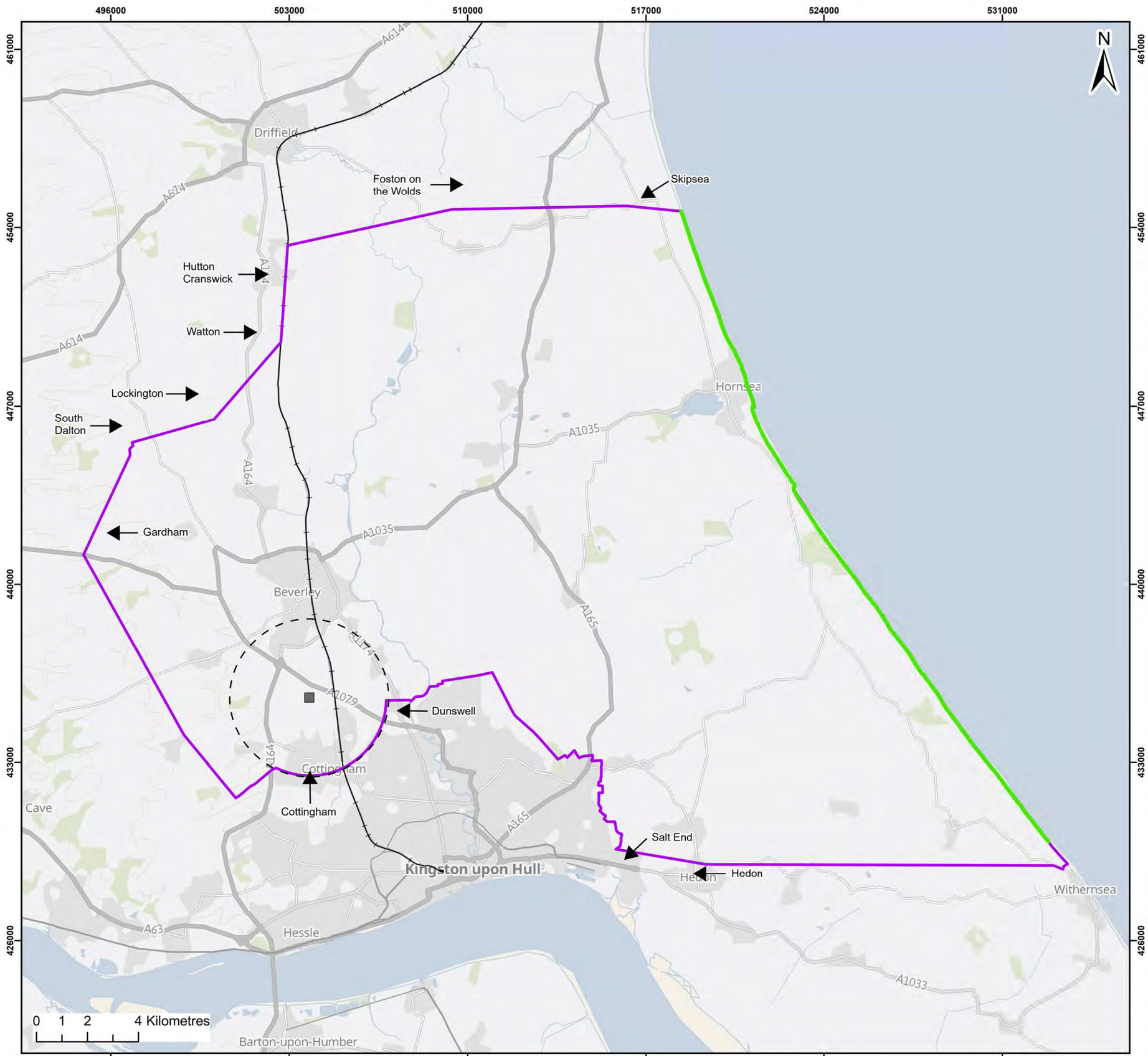
- Locate the corridor as close as practicable to the edge of field boundaries to minimise impacts to landowners and agricultural use.
- Avoid stand-alone residential properties, urban settlements and other areas with substantial infrastructure (e.g. airfields, industrial parks and holiday and caravan parks).
- Minimise interactions with other existing and planned infrastructure (e.g. onshore wind farms and solar farms).
- Minimise the number of utilities, road, rail and watercourse (e.g. main rivers and Internal Drainage Board (IDB) maintained drains) crossings.
- Where crossings are identified, perpendicular crossings should be sought where practicable.
- Avoid and minimise impacts to mature and ancient woodlands.
- Avoid and minimise impacts to internationally, nationally and locally designated ecological sites (e.g. SAC, SPA, SSSI, Local Wildlife Sites (LWS)).
- Avoid known areas of contaminated land risk, including authorised and historic landfills.
- Avoid and minimise impacts to internationally, nationally and locally designated landscape areas (e.g. National Landscapes) and cultural heritage assets (e.g. Scheduled Monuments, Listed Buildings and Conservation Areas).

5.10.3 Identification of Onshore Export Cable Corridor Long List Options and BRAG Assessment

85. Onshore ECC options were identified originating from the seven long listed landfall options and terminating at the OCS zone AoS boundary as shown on **Sheet 1** of **Figure 5-11**. Following an initial review of environmental and engineering constraints, several options were discounted due to identified pinch points, and alternative corridor sections to some of the discounted options were added, as described in **Table 5-8** and shown on **Sheet 2** of **Figure 5-11**.

86. Where there were multiple options for onshore export cable routeing at the same location, the less favourable option was discounted based on a comparison of corridor length, number and complexity of obstacle crossings and proximity to sensitive receptors.

87. Five main corridor sections connecting the landfall options to the OCS zone AoS were long listed, with slight variations to the corridor routeing to the west of Beverley (hereafter “branching corridor sections”). This resulted in a total of 54 onshore ECC route variations that were taken forward to the BRAG assessment as shown on **Sheet 3** of **Figure 5-11**.



Legend:

- Onshore Export Cable Corridor Area of Search
- Onshore Converter Station Zone Area of Search
- Refined Landfall Area of Search
- Hull to Scarborough Railway Line
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Area of Search

Figure: 5-10

Drawing No: PC6250-RHD-XX-OF-DR-GS-0177

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Co-ordinate system: British National Grid

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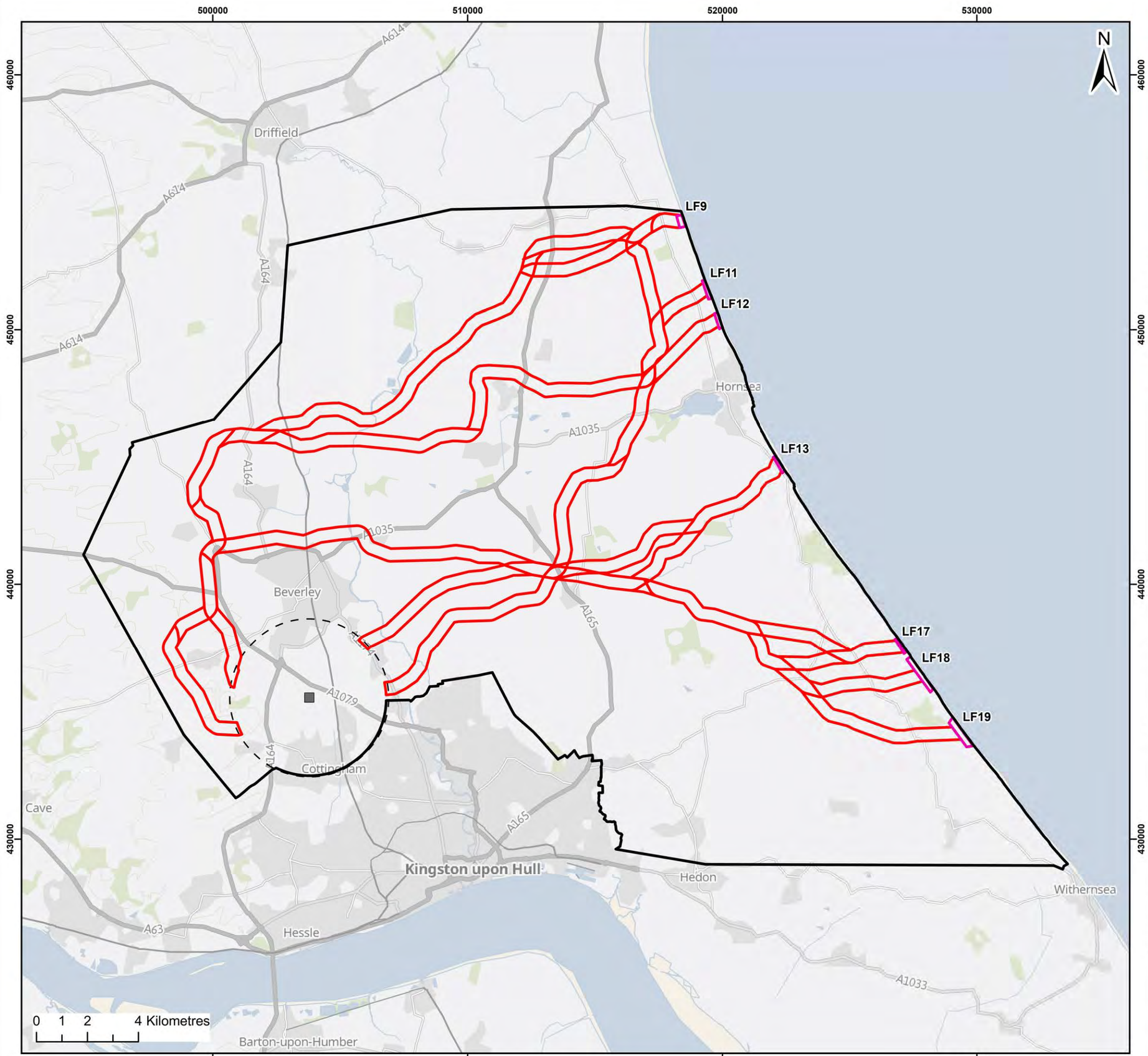

Legend:

- Onshore Export Cable Corridor Area of Search
- Landfall Long List Options
- Onshore Converter Station Zone Area of Search
- Initial Onshore Export Cable Corridor Options
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Export Cable Corridor - Long List Options - Sheet 1 of 3

Figure: 5-11

Drawing No: PC6250-RHD-XX-OF-DR-GS-0178

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
02	02/04/2025	JH	AB	A3	1:150,000
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Co-ordinate system: British National Grid

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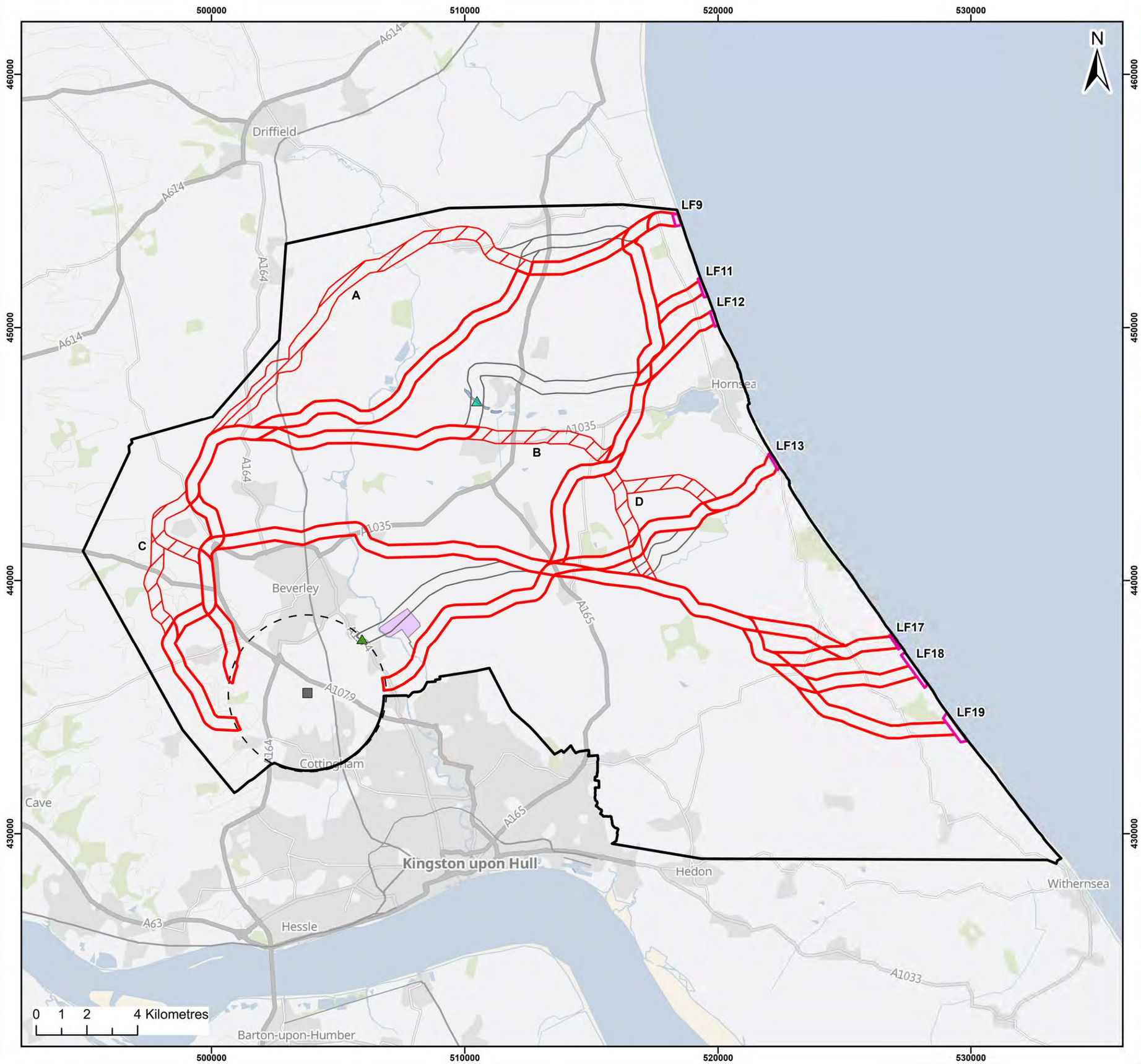

Legend:

- Onshore Export Cable Corridor Area of Search
- Landfall Long List Options
- Onshore Converter Station Zone Area of Search
- Onshore Export Cable Corridor Options Taken Forward at Long Listing Stage
- Onshore Export Cable Corridor Alternatives Taken Forward at Long Listing Stage
- Onshore Export Cable Corridor Options Excluded at Long Listing Stage
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Key Constraints

- Brandesburton Gravel Pits
- Solar Farm Planning Application 22/01208/STPLF

Pinch Points

- Brandesburton Pinch Point
- Woodmansey Pinch Point

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Onshore Export Cable Corridor - Long List Options - Sheet 2 of 3

Figure: 5-11

Drawing No: PC6250-RHD-XX-OF-DR-GS-0178

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Co-ordinate system: British National Grid

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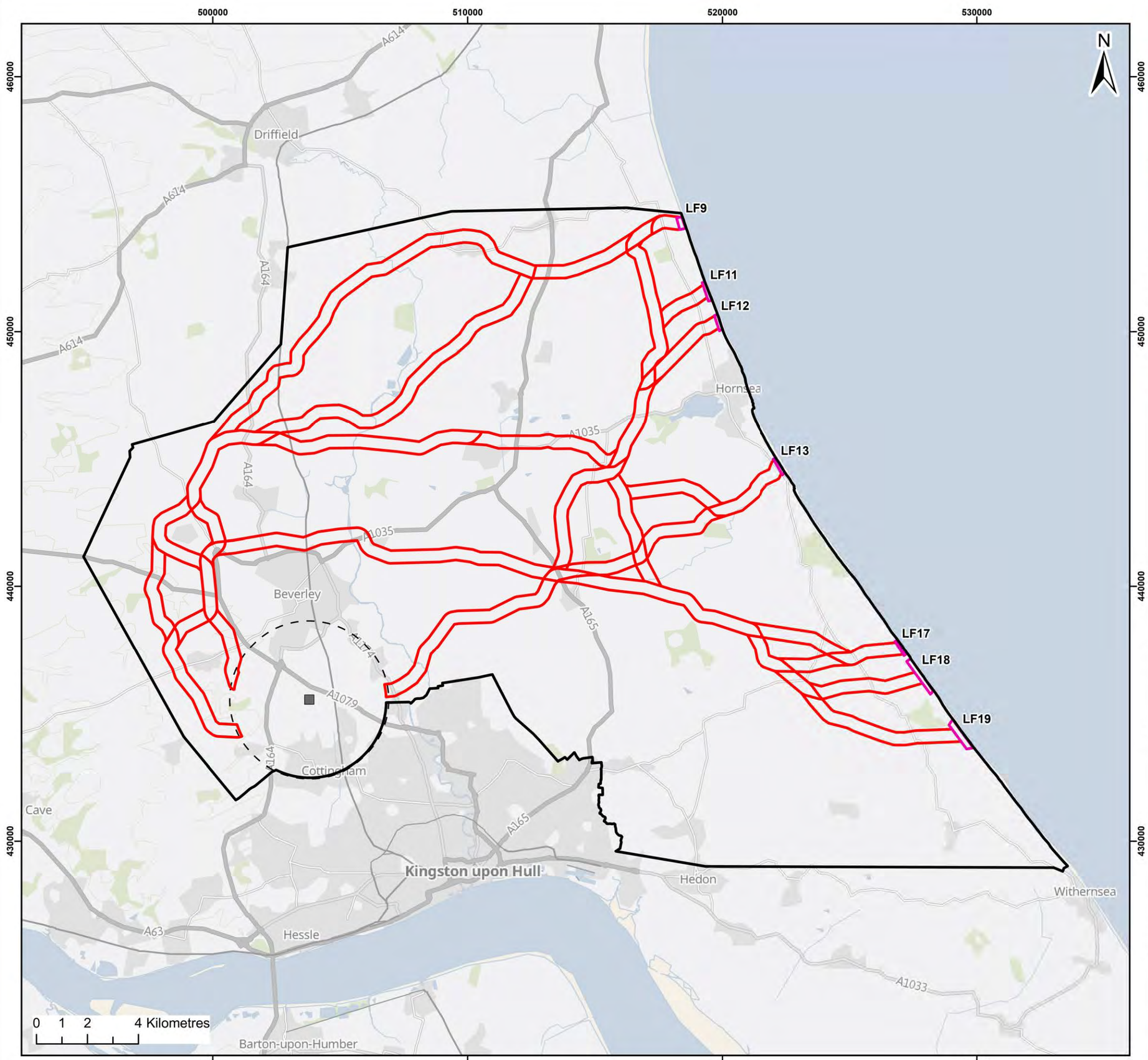

Legend:

- Onshore Export Cable Corridor Area of Search
- Landfall Long List Options
- Onshore Converter Station Zone Area of Search
- Onshore Export Cable Corridor Long List Options
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Export Cable Corridor - Long List Options - Sheet 3 of 3

Figure: 5-11

Drawing No: PC6250-RHD-XX-OF-DR-GS-0178

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Co-ordinate system: British National Grid

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Table 5-8 Summary of Onshore ECC Long Listing Decisions

Onshore ECC Option	Decision and Rationale
All options via Woodmansey Pinch Point	**Excluded** due to: • Known poor ground conditions considered to have a high risk of drilling fluid frac-out and bore collapse from Dogger Bank A & B construction experience; • Unavoidable overlap with Figham Pastures Common Land, which may require complex land agreement procedures; • Unavoidable crossing with above-ground infrastructure associated with a solar farm planning application. Potential constructability risks; and • Limited availability of physical space for onshore export cable infrastructure due to Dogger Bank A & B onshore export cables, historic landfills and residential properties located at the A-road crossing.
All options via Brandesburton Pinch Point	**Excluded** due to: • Unavoidable overlap with abandoned sand and gravel quarry ponds with likely poor ground conditions and unknown depths and constructability risks.
Remaining options and alternatives added	In addition to the remaining options, the following alternative corridor sections were **taken forward to the BRAG assessment**: • Alternative corridor section around North Frodingham to avoid routeing near Tophill Low SSSI and overlap with reservoir flood extents (shown as Section A, **Sheet 2 of Figure 5-11**); • Alternative corridor section around Sigglesthorne as a re-route to discounted options due to the Brandesburton Pinch Point (shown as Section B, **Sheet 2 of Figure 5-11**); • Alternative corridor sections west of Cherry Burton and Bishop Burton to maintain sufficient flexibility for onshore export cable routeing (shown as Sections C, **Sheet 2 of Figure 5-11**); and • Alternative corridor sections to connect southern landfall options (LF13 to LF19) further north and maintain sufficient flexibility for onshore export cable routeing (shown as Sections D, **Sheet 2 of Figure 5-11**).

5.10.4 Identification of Onshore Export Cable Corridor Short List Options for Scoping

88. Based on the decision to only take forward a single preferred landfall option (as discussed in **Section 5.8.5**), all onshore ECC options originating from other landfall options were subsequently discounted. Following the BRAG assessment, several onshore ECC options were discounted based on identified pinch points and high environmental and engineering risks, and alternatives to some of the discounted options were added, as described in **Table 5-9** and shown on **Sheet 1** of **Figure 5-12**.

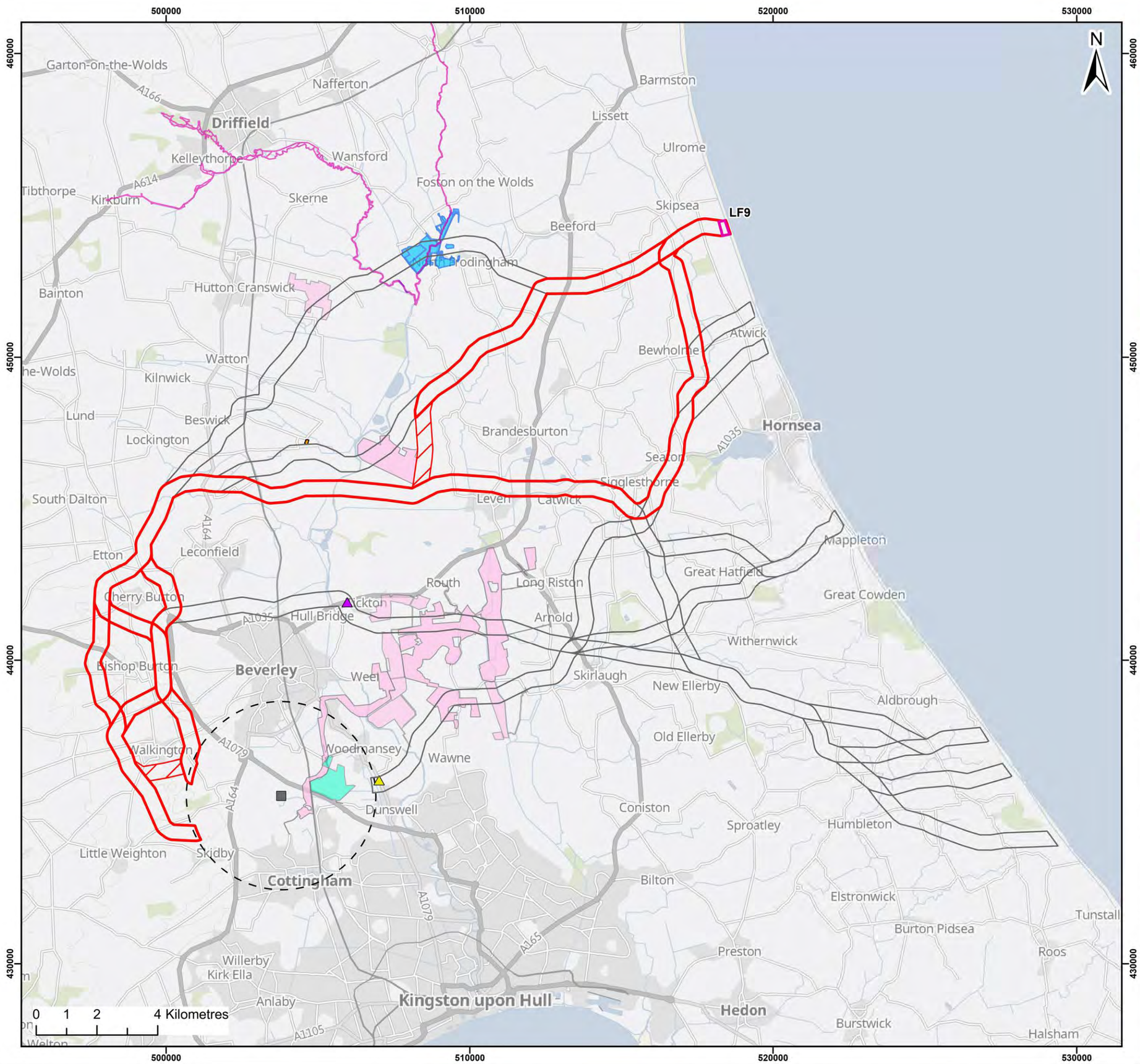
89. The short listed options included two main corridor sections connecting landfall LF9 to the OCS zone AoS and all branching corridor sections to the west of Beverley, resulting in a total of 16 onshore ECC route variations. The short listing of the onshore ECC options is illustrated on **Sheet 2** of **Figure 5-12**, with the two main corridor sections labelled as "Onshore ECC 2 Alt" and "Onshore ECC 3" respectively.

90. At the EIA scoping stage, the Onshore Scoping Area (Royal HaskoningDHV, 2024) was defined as a broad area to accommodate these short listed onshore ECC options and allow flexibility for further site selection refinement and to potentially coordinate with other local developments post-scoping.

Table 5-9 Summary of Onshore ECC Short Listing Decisions

Onshore ECC Option	Decision and Rationale
All options originating from LF11, LF12, LF13, LF17, LF18 and LF19	**Excluded**, as only LF9 has been taken forward as the preferred landfall option.
All options overlapping the River Hull Headwaters SSSI	**Excluded** due to: • Complex crossings with the River Hull Headwaters SSSI and main rivers; • Likely poor ground conditions considered to have a high risk of drilling fluid frac-out and bore collapse and potential for high groundwater table considered unfavourable for open cut trenching; • Unavoidable overlap with a large area of coastal and floodplain grazing marsh Habitat of Principal Importance. Avoidance using trenchless installation techniques and an off-route haul road were considered technically unfeasible due to the length required; and • Unavoidable crossing with above-ground infrastructure associated with an approved solar farm planning application. Potential constructability risks.
All options with solar farm interactions	**Excluded** due to unavoidable crossing(s) with above-ground infrastructure associated with at least one approved or pending consideration solar farm planning applications. Potential constructability risks. The two main corridor sections were selected as they only interact with the below-ground cables associated with solar farm planning applications.
All options via Tickton Pinch Point	**Excluded** due to limited availability of physical space for onshore export cable infrastructure due to residential properties and A-road and unclassified road crossings and acute bend in the corridor approaching limits to maximum cable curvature. Potential constructability risks.

Onshore ECC Option	Decision and Rationale
All options via Dunswell Pinch Point	**Excluded** due to: • Limited availability of physical space for onshore export cable infrastructure due to main rivers, residential properties, A-road crossing, extra-high voltage overhead line and INEOS/SABIC ethylene pipeline; and • Challenges with onwards onshore export cable routeing due to interactions with fishing ponds, Hull-Scarborough railway line, an approved planning application and existing buildings.
Remaining options and alternatives added	Two main corridor sections (Onshore ECC 2 Alt and Onshore ECC 3) were **included** in the short list, as further engineering and environmental studies and landowner and stakeholder engagement were required to understand to conclude the preferred option. All branching corridor sections to the west of Beverley were **included** in the short list due to comparable environmental and engineering risks. Optionality was retained to allow additional landowner and stakeholder feedback to be obtained to differentiate between the options. In addition to the remaining options, the following alternative corridor sections were **included** in the short list: • Alternative corridor section on approach to OCS zone AoS south of Walkington to avoid a potential engineering pinch point on Broadgate Road (see **Section 5.10**); and • Alternative corridor section south of Tophill Low Reservoir to avoid crossing with above-ground infrastructure associated with a solar farm planning application and minimise risk from high potential for buried archaeology around a Scheduled Monument. Further consideration of risks associated with the short listed options are discussed in **Section 5.10**.



Legend:

- Landfall Preferred Option
- Onshore Export Cable Corridor Alternatives Taken Forward at Short Listing Stage
- Onshore Export Cable Corridor Options Taken Forward at Short Listing Stage
- Onshore Export Cable Corridor Options Excluded at Short Listing Stage
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Pinch Points

- Dunswell Pinch Point
- Tickton Pinch Point

Key Constraints

- River Hull Headwaters Site of Special Scientific Interest
- Scheduled Monument (Barf Hill Moated Site)
- Priority Habitat Coastal and floodplain grazing marsh
- Other Planning Applications
- Solar Farm Planning Applications

Note: Boundaries of other developments are based on a search of publicly available data undertaken at this stage of the site selection process and are subject to change.

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Onshore Export Cable Corridor - Short List Options - Sheet 1 of 2

Figure:	Drawing No:
5-12	PC6250-RHD-XX-OF-DR-GS-0179

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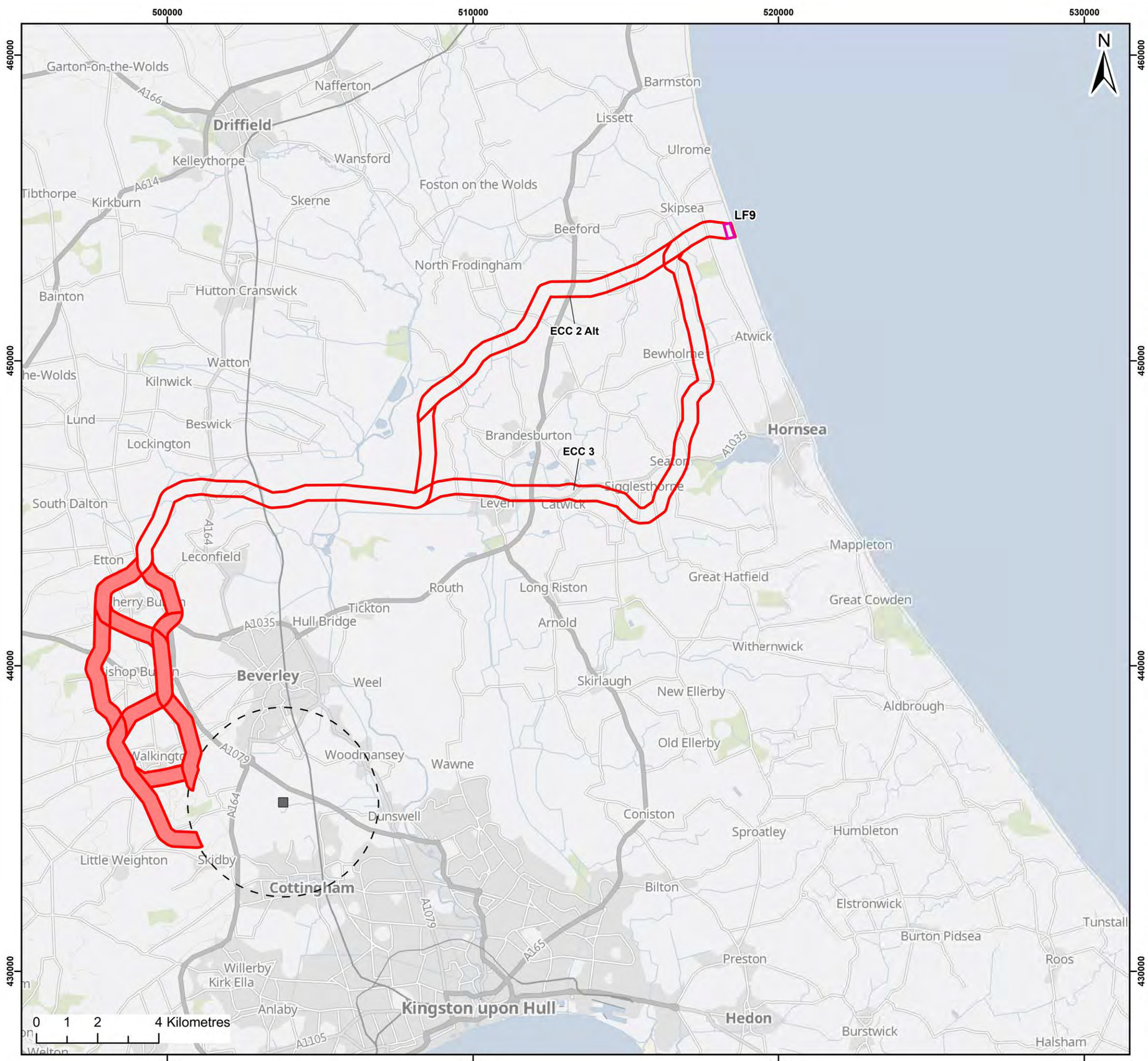

Legend:

- Landfall Preferred Option
- Onshore Export Cable Corridor Short List Options
- Branching Corridor Sections
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Note: Boundaries of other developments are based on a search of publicly available data undertaken at this stage of the site selection process and are subject to change.

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Export Cable Corridor - Short List Options - Sheet 2 of 2

Figure: 5-12

Drawing No: PC6250-RHD-XX-OF-DR-GS-0179

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Co-ordinate system: British National Grid

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5.10.5 Identification and Refinement of the Preferred Onshore Export Cable Corridor Options for PEIR

91. This section describes the refinement undertaken on the onshore ECC options from post-scoping to PEIR in chronological order. This includes the refinement of the short listed onshore ECC options used to inform the Onshore Scoping Area into the options presented at the non-statutory consultation in September 2024 and subsequent refinement following the non-statutory consultation to inform the Onshore Development Area presented in the PEIR.

5.10.5.1 Post-Scoping to Non-Statutory Consultation

92. Following short listing of the onshore ECC options, the two main corridor sections (Onshore ECC 2 Alt and Onshore ECC 3) were presented to technical stakeholders at a Site Selection ETG meeting held on the 7th August 2024, and a summary of their feedback is presented in **Table 5-10**. The key constraints discussed in the table are shown on **Sheet 1** of **Figure 5-13**.

Table 5-10 Summary of Site Selection ETG Comments on Short Listed Onshore ECC Options

Stakeholder	Summary of Comments
East Riding of Yorkshire Council and Natural England	**Onshore ECC 2 Alt:** If this option is taken forward, further investigation is required into the potential impacts on Tophill Low SSSI with respect to potential pollution pathways associated with reservoir flooding. **Onshore ECC 3:** If this option is taken forward, further investigation is required into the potential impacts on Hornsea Mere SPA / SSSI /Important Bird Area (IBA).
Environment Agency	**Onshore ECC 2 Alt:** This option has a crossing location in proximity to the Hempholme Pumping Station and surrounding flood defences owned by the Environment Agency. The crossing design would require further discussion with the Environment Agency to determine no adverse effects to the existing infrastructure and future climate change adaptation plans. With respect to reservoir flood risk, as the Tophill Low Reservoir is a managed asset, the risk to Onshore ECC 2 Alt is considered unlikely.

93. In addition, prior to the non-statutory consultation held between 10th September to 22nd October 2024, two branching corridor sections were discounted as described in **Table 5-11**and shown on **Sheet 1** of **Figure 5-13**. This resulted in a single entry point into the OCS zone AoS south of Walkington. The remaining options were taken forward for further refinement as described below.

Table 5-11 Summary of Onshore ECC Refinement Decisions Leading up to Non-Statutory Consultation

Onshore ECC Option	Decision and Rationale
All options via Broadgate Pinch Point	**Excluded** due to limited availability of physical space for onshore export cable infrastructure due to Hornsea Four onshore export cables, residential properties, extra-high voltage overhead line and INEOS/SABIC ethylene pipeline located at the B-road crossing.
All options via the southernmost entry point into OCS zone AoS	**Excluded** as the more northern option into the OCS zone AoS was determined to be feasible and provides a more direct route, decreasing corridor length and therefore construction costs and temporary impacts on the environment and communities.

94. At this stage, the corridor width was narrowed from 500m to 200m as shown on **Sheet 2** of **Figure 5-13**. While a 200m-wide corridor was defined for the majority of the onshore ECC route, at certain locations, the corridor width was widened or reduced to account for specific environmental, engineering or land constraints.

95. During refinement, site selection principles used during the initial onshore ECC routeing exercise (as discussed in **Section 5.10.2**) were refined where relevant to incorporate setback distances from constraints, and new environmental and engineering principles were also considered. The following additional site selection principles were introduced during onshore ECC refinement and adhered to as far as practicable:

- Consider potential locations for temporary haul road, construction compounds trenchless crossing locations and accesses from the public highway including the delivery of abnormal loads;
- Minimise the number of hedgerow crossings;
- Maintain sufficient setback distances from major utilities except at crossing locations;
- Avoid and minimise impacts to Public Rights of Way (PRoW) and cycle routes;
- Avoid and minimise impacts to UK Habitats of Principal Importance and Irreplaceable Habitats; and
- Minimise impacts to Mineral Safeguarding Areas and Local Geological Sites (LGS).

96. In addition, micro-siting was considered to avoid constraints where practicable and minimise environmental and engineering risks along the onshore ECC route, and consideration was also given to landowner and stakeholder feedback received from the consultation activities undertaken to date. The boundary shown on **Sheet 2** of **Figure 5-13** illustrates the onshore ECC options presented at the non-statutory consultation.

5.10.5.2 Non-Statutory Consultation to PEIR

97. Following the non-statutory consultation, a single main corridor section and branching corridor section were selected based on landowner and stakeholder feedback and subsequent comparisons of environmental and engineering risks, as described in **Table 5-12** and shown on **Sheet 3** of **Figure 5-13**. This resulted in a single preferred onshore ECC option from landfall LF9 to the OCS zone AoS, which was selected as the Onshore Development Area taken forward for further refinement. This option comprises Onshore ECC 2 Alt as the main corridor section and a branching corridor section to Birkhill Wood Substation which runs east of Cherry Burton and Bishop Burton before arching around Walkington into the OCS zone AoS.

98. The key modifications undertaken during the refinement of the preferred onshore ECC option included the following areas, which were informed by landowner and asset owner feedback and non-statutory consultation feedback:

- Widening of the corridor near Aike to allow flexibility for the River Hull crossing and micro-siting to avoid impacts to a vineyard due to land severance and crop loss;
- Widening of the corridor around the Hempholme Pumping Station to allow for engineering flexibility at the cable crossing location with an option to route the haul road through further south; and
- Widening of the corridor near Beverley Airfield and south of Walkington to allow additional physical space for onshore export cable routeing through a tight bend.

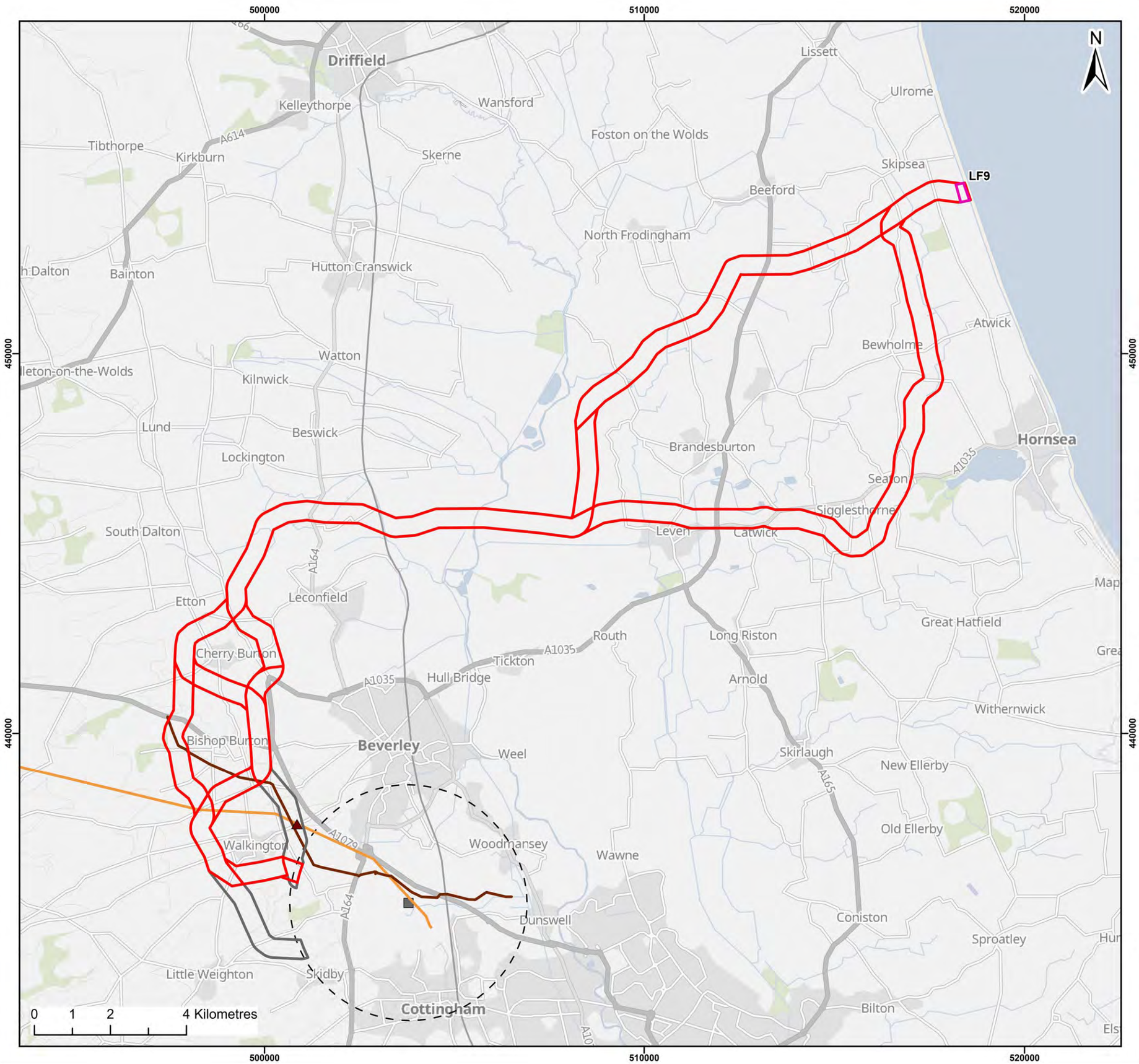
99. In addition, land for ancillary infrastructure required to facilitate the construction and operation and maintenance (O&M) of the onshore export cables were identified during the refinement stage and included in the Onshore Development Area. This comprises temporary construction accesses and associated visibility splays and traffic accommodation works, O&M accesses and potential temporary construction compounds where a suitable location was identified outside of the corridor. The locations of ancillary infrastructure are indicative at this stage and subject to refinement once further information on the engineering design and access strategy becomes available. The indicative locations of temporary construction compounds for onshore export cable works are identified on **Figure 4-2** in **Chapter 4 Project Description**. Accesses to the onshore ECC are discussed further in **Chapter 26 Traffic and Transport**.

100. The refinement of the preferred onshore ECC option is illustrated on **Sheet 3** of **Figure 5-13** and the resulting Onshore Development Area is shown on **Sheet 4** of **Figure 5-13**.

Table 5-12 Summary of Onshore ECC Preferred Option Decisions for PEIR

Onshore ECC Option	Decision and Rationale
All options via Onshore ECC 3 main corridor section	**Excluded** due to: • Complex crossings with two national high pressure gas pipelines near the Atwick Gas Storage Facility; • Increased risk of drilling fluid frac-out and bore collapse around Leven and Catwick due to variability of ground conditions and the presence of sand and gravels when compared to other areas; • Unfavourable construction access due to routeing traffic through sensitive locations such as Leven and Hornsea; • Proximity to Hornsea Mere SPA / SSSI / IBA: o Although no direct physical impacts to habitats within the designated site are anticipated, there are potential impacts to functionally linked land within the corridor that may be critical to the ecological or behavioural functions of qualifying features; o Seasonal restrictions may be required to minimise disturbance and displacement impacts which would present challenges to the construction programme; and o As a groundwater dependent terrestrial ecosystem, there was an additional risk for a potential impact pathway from construction works within the corridor with respect to groundwater quality and flow. In addition, compared to Onshore ECC 2 Alt, Onshore ECC 3 has: • A higher number of affected landowners and local businesses, including more small-scale agricultural businesses that may be unable to absorb the financial impacts from disruptions during construction; • A higher number of urban centres in greater proximity such as Seaton and Sigglesthorne, and therefore higher potential for disruption from construction activities; • A higher number of Conservation Areas and Listed Buildings in greater proximity; and • A longer corridor length and higher number and complexity of obstacle crossings, and therefore longer construction duration, costs and temporary impacts on the environment and communities.

Onshore ECC Option	Decision and Rationale
All options via branching corridor sections west of Bishop Burton and Cherry Burton	**Excluded** due to: • Unavoidable overlap with land owned by the Bishop Burton College of Agriculture. Agricultural activities (including land covered under environmental land management schemes) would be severely curtailed over the impacted land, risking the college's ability to offer the current educational opportunities on land required for the Project. All disruptions during construction would require extensive mitigation, such as seasonal restrictions to the construction programme, as well as costly and complex compensation liabilities against the Project; • Potential for significant impacts to an agricultural business due to land severance, livestock disturbance and crop loss; and • Unfavourable construction access due to routeing traffic through sensitive locations such as Bishop Burton and Cherry Burton.
Remaining option (Onshore ECC2 Alt main corridor section and branching corridor section east of Bishop Burton and Cherry Burton)	**Selected as the preferred option** due to avoidance of the key environmental, engineering and land risks identified for the discounted options discussed above. With respect to stakeholder comments received from the Site Selection ETG meeting on Onshore ECC 2 Alt (see **Table 5-10**), it was determined that a pollution pathway from construction works to the Tophill Low SSSI is unlikely. In the unlikely event of overtopping, flooding would occur downstream of the reservoir and thus away from the Tophill Low SSSI (further details provided in **Volume 2, Appendix 21.1 Consultation Responses for Water Resources and Flood Risk**). Further engagement was undertaken with the Environment Agency with a meeting held on the 26th November 2024 to discuss the cable crossing in proximity to the Hempholme Pumping Station and associated assets. A commitment to use a trenchless crossing technique at this location (Crossing ID WX-29 in **Volume 2, Appendix 4.3 Crossing Schedule - Onshore)** has been agreed with the Environment Agency and added as Commitment ID CO104 (see **Volume 2, Appendix 6.3 Commitments Register**).



Legend:

- Onshore Export Cable Corridor Options Taken Forward to Refinement for Non-Statutory Consultation
- Onshore Export Cable Corridor Options Excluded Prior to Non-Statutory Consultation
- Landfall Preferred Option
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Pinch Points

- Broadgate Pinch Point

Key Constraints

- National Grid Overhead Lines
- INEOS/SABIC ethylene pipeline

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Export Cable Corridor Refinement - Onshore Development Area for PEIR - Sheet 1 of 4

Figure: 5-13

Drawing No: PC6250-RHD-XX-OF-DR-GS-0180

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Co-ordinate system: British National Grid

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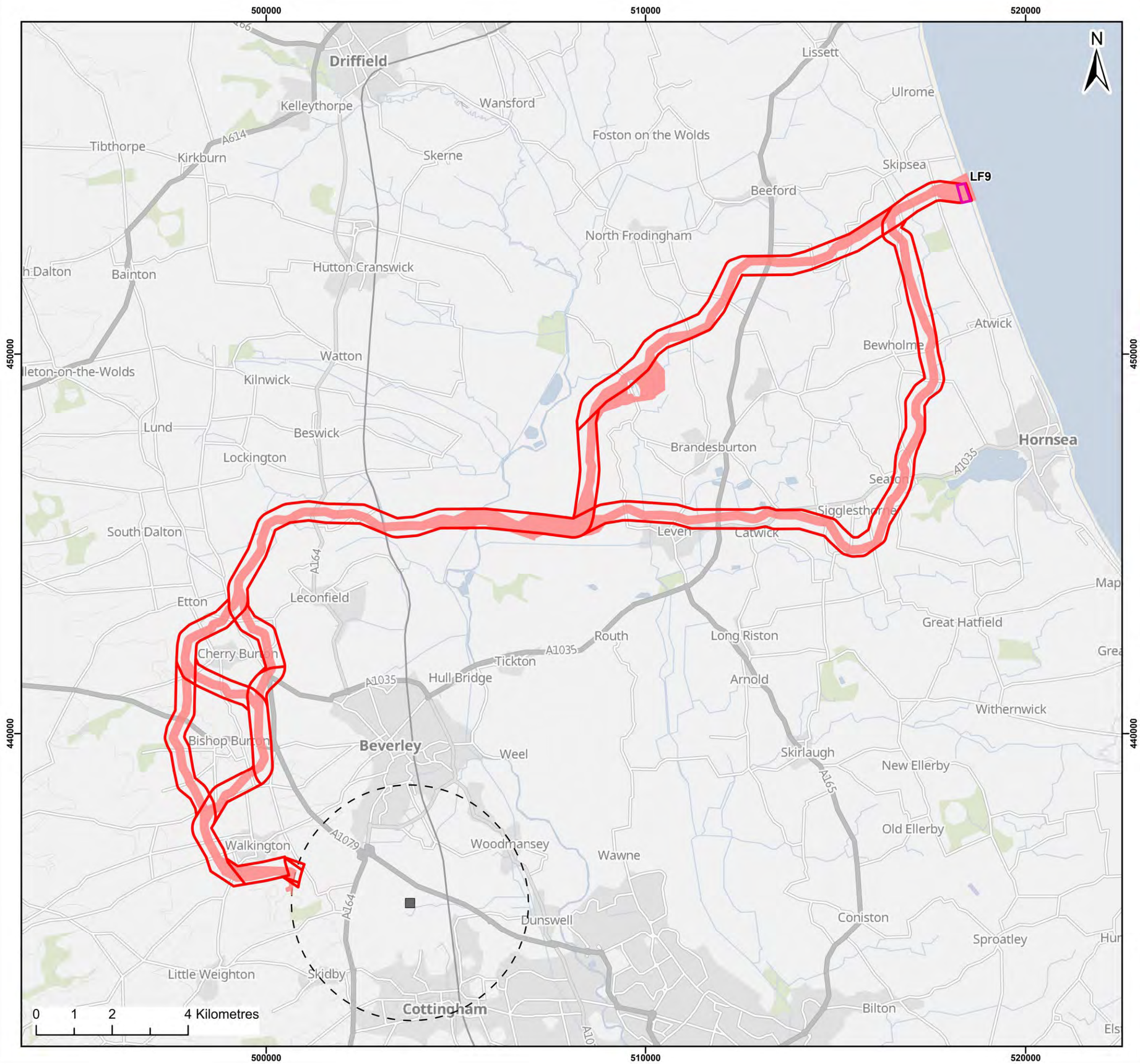

Legend:

- Onshore Export Cable Corridor Options Taken Forward to Refinement for Non-Statutory Consultation
- Landfall Preferred Option
- Modifications During Refinement Prior to Non-Statutory Consultation
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Export Cable Corridor Refinement - Onshore Development Area for PEIR - Sheet 2 of 4

Figure: 5-13

Drawing No: PC6250-RHD-XX-OF-DR-GS-0180

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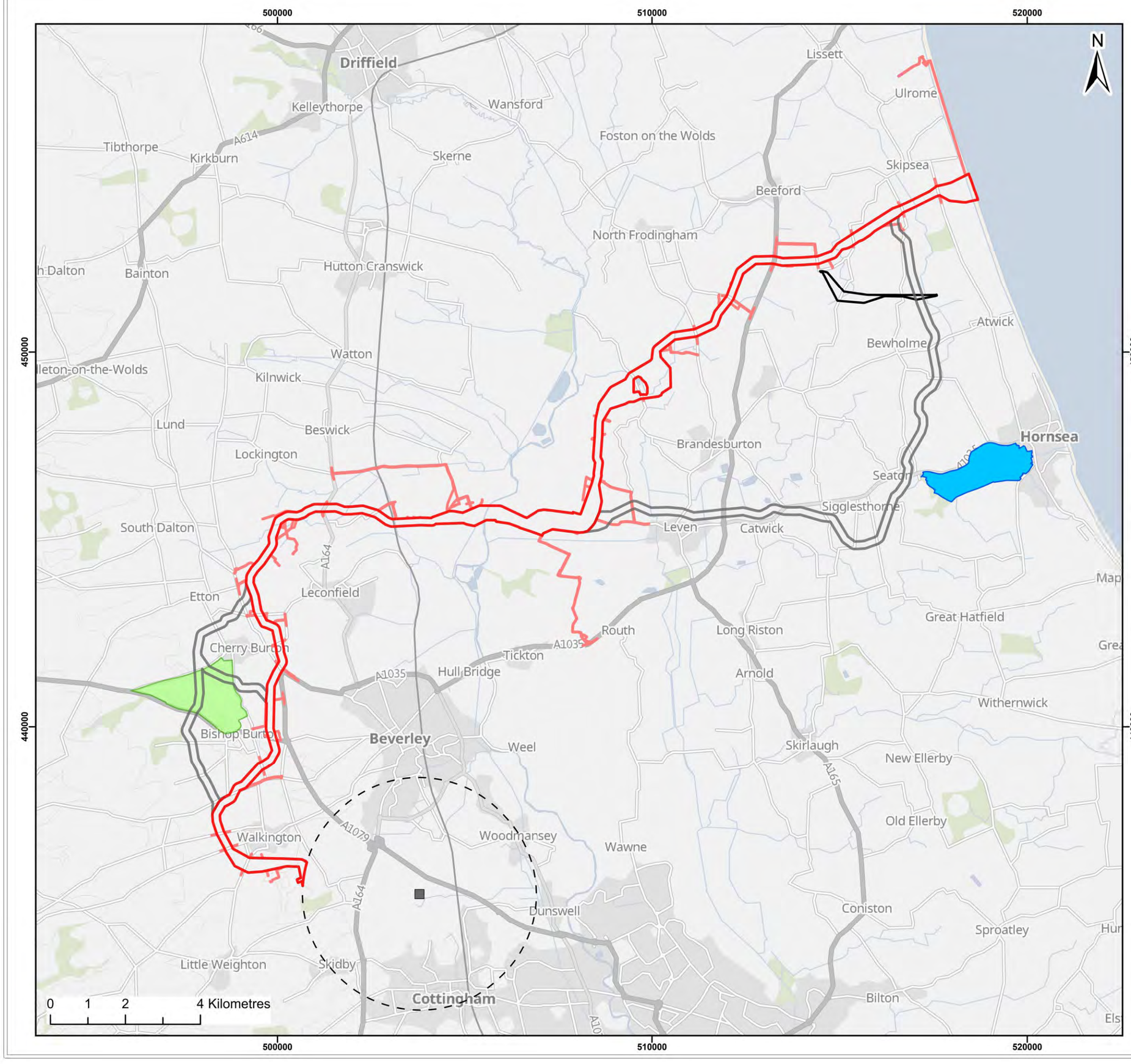

Legend:

- Onshore Export Cable Corridor Options Taken Forward Following Non-Statutory Consultation
- Modifications During PEIR Refinement Stage Following Non-Statutory Consultation
- Onshore Export Cable Corridor Options excluded at Non Statutory Consultation Stage
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Key Constraints

- Hornsea Mere Special Protection Area / Site of Special Scientific Interest / Important Bird Area
- National Grid gas pipelines
- Bishop Burton College of Agricultural Land

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Export Cable Corridor Refinement - Onshore Development Area for PEIR - Sheet 3 of 4

Figure: 5-13

Drawing No: PC6250-RHD-XX-OF-DR-GS-0180

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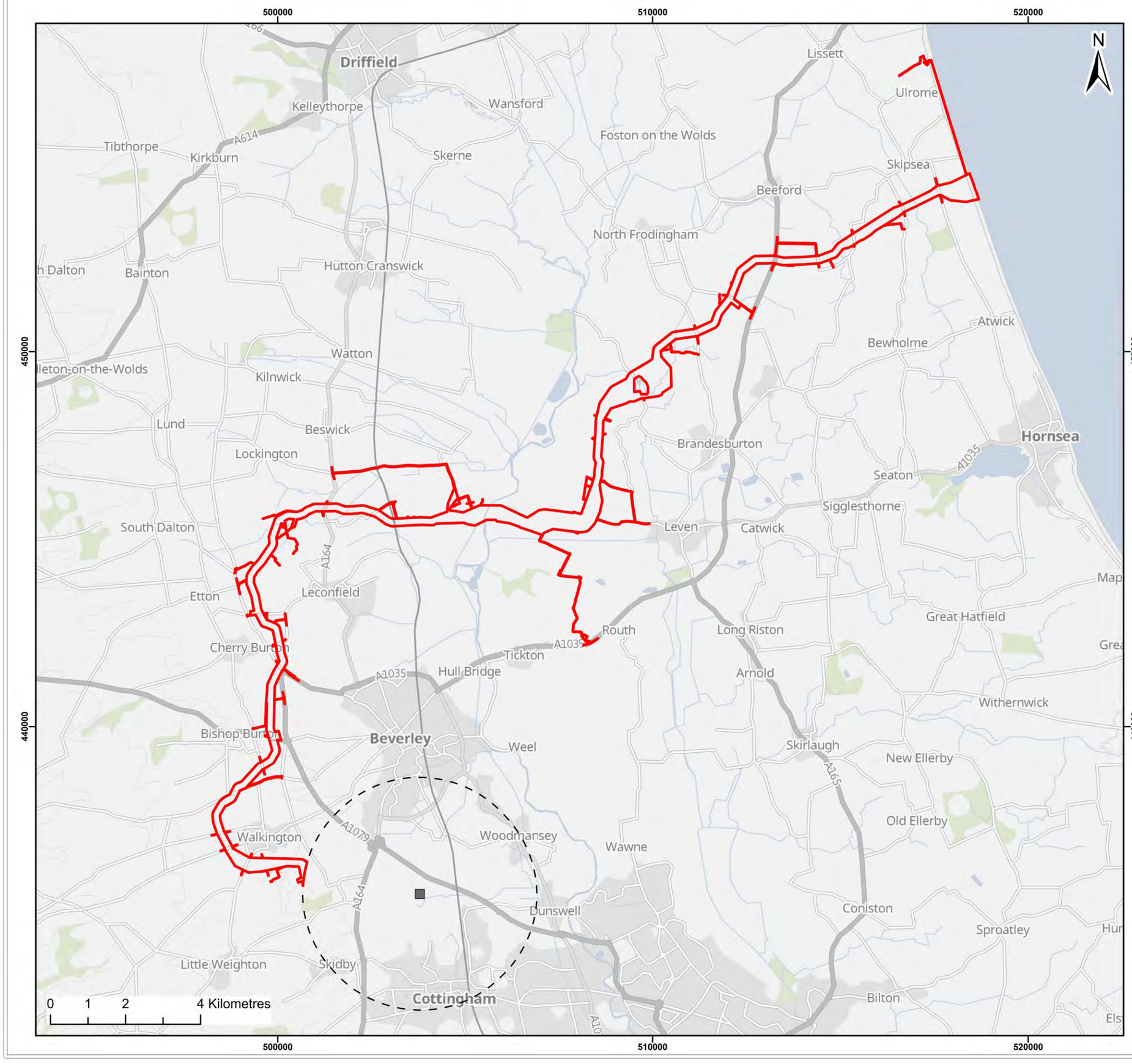

Legend:

- Onshore Development Area
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Export Cable Corridor Refinement - Onshore Development Area for PEIR - Sheet 4 of 4

Figure: 5-13

Drawing No: PC6250-RHD-XX-OF-DR-GS-0180

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5.11 Onshore Converter Station Zone

5.11.1 Defining the Onshore Converter Station Zone Area of Search

101. Using the indicative location of Birkhill Wood Substation provided by NESO, the OCS zone AoS was defined as a 3km search radius around the grid connection point. This 3km radius was set to minimise the length of High Voltage Alternating Current (HVAC) onshore export cables required to connect into the electricity transmission network and maximise the power transfer. In addition to compliance with the Grid Code required for connection into the UK transmission network, minimising this distance was considered appropriate to reduce the quantity of reactive compensation equipment required, mitigate transmission losses and minimise adverse effects on economic efficiency. The OCS zone AoS is illustrated on **Figure 5-14**.

5.11.2 Site Selection Principles and Engineering Assumptions

102. The OCS zone was identified to co-locate the OCS and co-located ESBI with a key factor being the availability of physical space to accommodate the permanent infrastructure and associated construction activities. Broad zones were identified based on a range of the minimum and maximum area required to site the platforms for permanent infrastructure, two temporary construction compounds and additional space for landscaping, drainage, access and environmental mitigation and enhancement.

103. The size of the OCS zone allowed flexibility for refinement at a later stage in the site selection process and provided contingencies for micro-siting to overcome unknown constraints that may arise during detailed site investigation and design.

104. Another key engineering principle was to consider connectivity to the onshore ECC identified for the HVDC and HVAC onshore export cables and their entry and exit points into the OCS zone to provide a holistic evaluation of the onshore transmission infrastructure.

105. The following site selection principles were used during OCS zone identification as far as practicable, which align with the principles in the Horlock Rules.

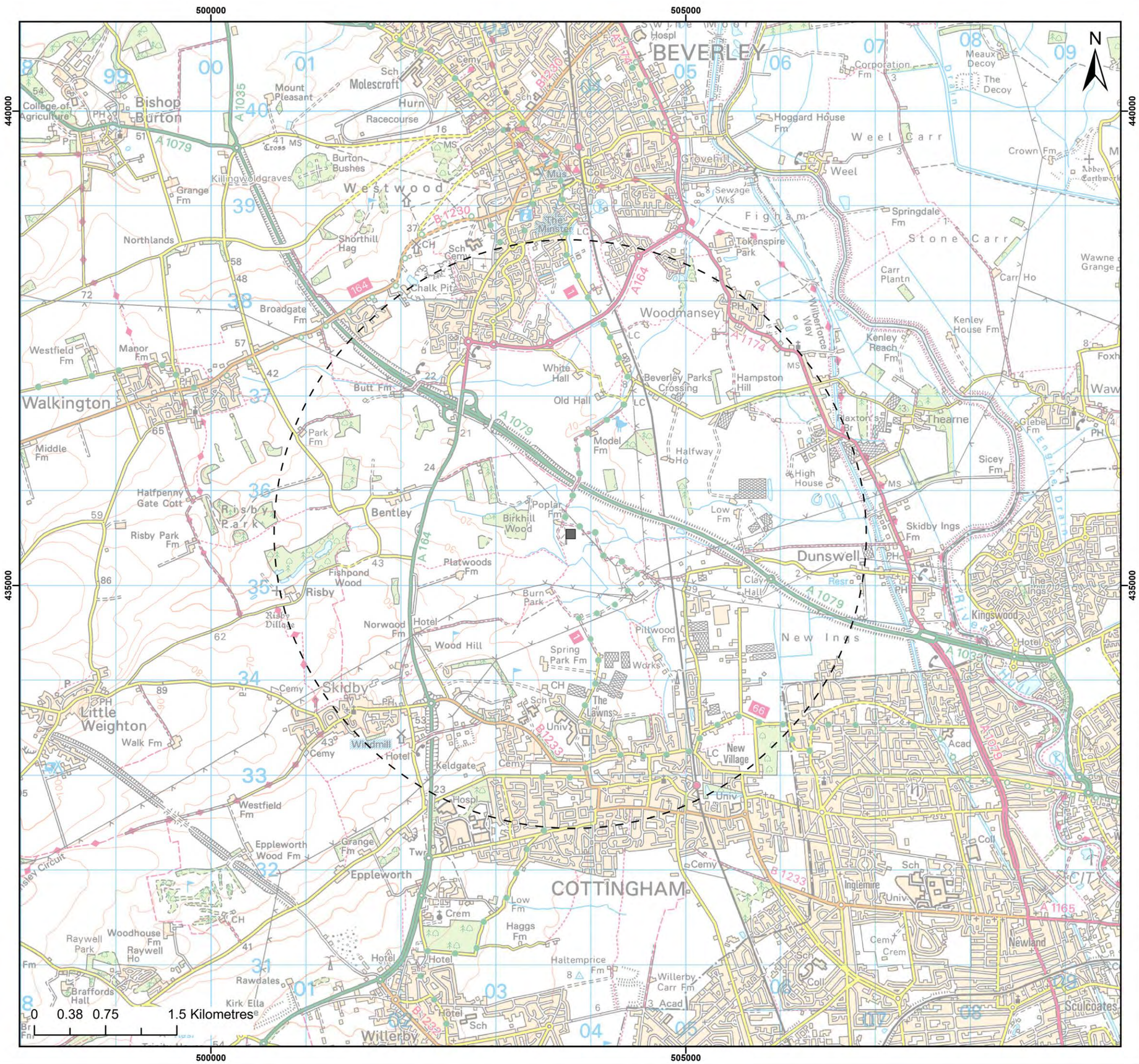
- Avoid stand-alone residential properties, urban settlements and other areas with substantial infrastructure and local amenity value (e.g. housing developments, golf courses and holiday and caravan parks) and maintain sufficient setback distances to minimise noise and landscape and visual impacts;
- Avoid overlap with Flood Zones 2 and 3 with respect to coastal and river flooding and areas with high-risk surface water flooding;
- Avoid and minimise impacts to mature and ancient woodlands;
- Avoid and minimise impacts to internationally, nationally and locally designated ecological sites (e.g. SSSI, LWS and Local Nature Reserves);
- Avoid and minimise interactions with other existing and planned developments where possible (e.g. residential and mixed-use, onshore wind farms, solar farms and battery storage developments);
- Avoid known areas of contaminated land risk, including authorised and historic landfills; and
- Avoid and minimise impacts to internationally, nationally and locally designated landscape areas (e.g. National Landscapes) and cultural heritage assets (e.g. Listed Buildings, Conservation Areas and Registered Parks and Gardens).

5.11.3 Identification of Onshore Converter Station Zone Long List Options and BRAG Assessment

106. A total of nine OCS zone options were initially identified within the OCS zone AoS as shown on **Panel 1** of **Figure 5-15**. Following an initial review of environmental and engineering constraints, two of the zone options were discounted for the reasons outlined in **Table 5-13** and shown on **Panel 2** of **Figure 5-15**. The seven remaining OCS zone options were included in the long list taken forward to the BRAG assessment as shown on **Panel 3** of **Figure 5-15**.

Table 5-13 Summary of OCS Zone Long Listing Decisions

OCS Zone Option	Decision and Rationale
Zone 1	**Excluded** due to unavoidable overlap with an approved horticultural planning application, leaving insufficient land.
Zone 2	**Excluded** due to unavoidable overlap with an approved solar farm planning application, leaving insufficient land.
Zone 3	**Taken forward to the BRAG assessment**
Zone 4	**Taken forward to the BRAG assessment**
Zone 5	**Taken forward to the BRAG assessment**
Zone 6	**Taken forward to the BRAG assessment**
Zone 7	**Taken forward to the BRAG assessment**
Zone 8	**Taken forward to the BRAG assessment**
Zone 9	**Taken forward to the BRAG assessment**



Legend:

- Grid Connection Point - Indicative Birkhill Wood Substation Location
- Onshore Converter Station Zone Area of Search (3km Buffer)

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Onshore Converter Station Zone - Area of Search - Sheet 1 of 2

Figure: 5-14

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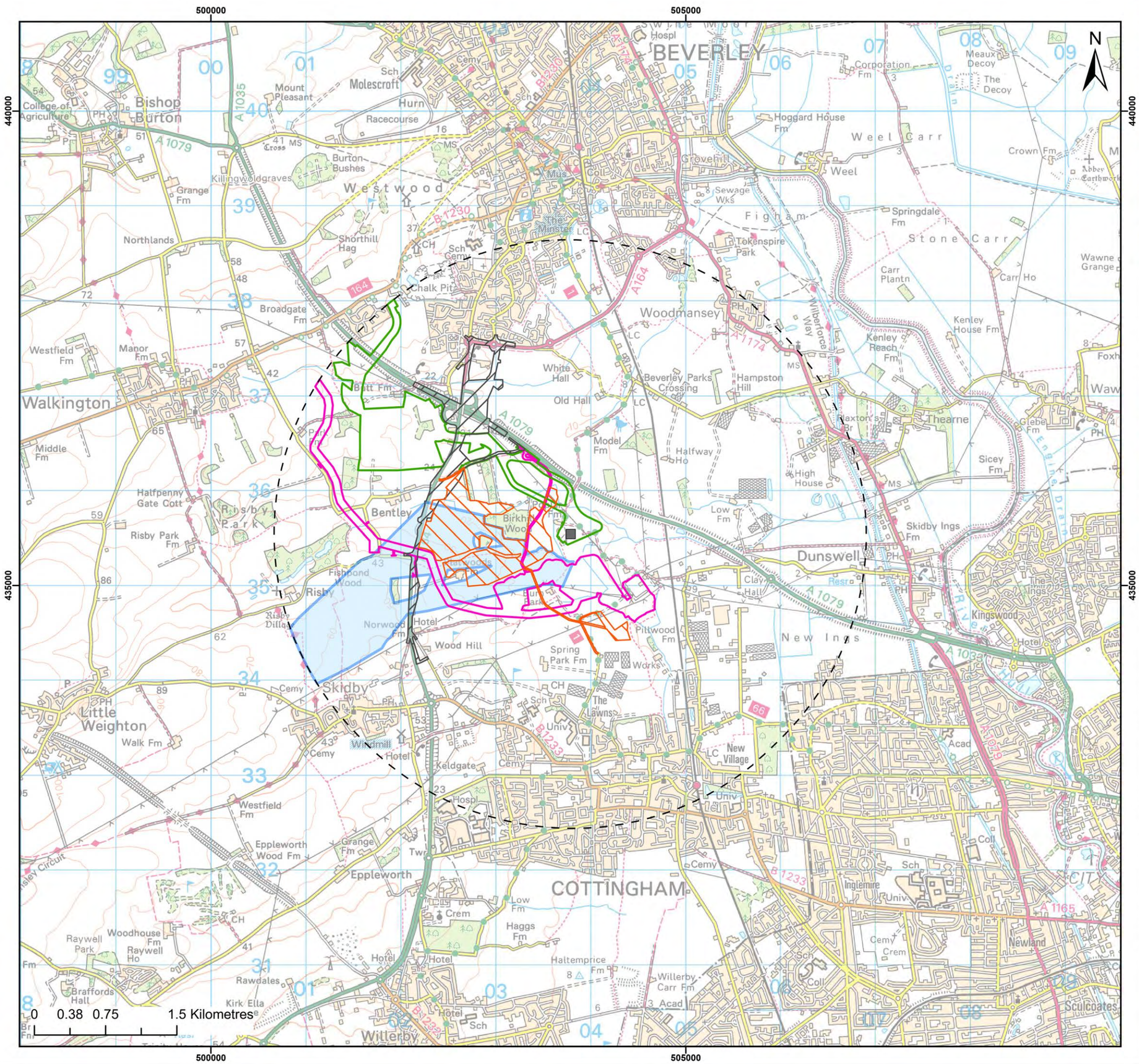

Legend:

- Grid Connection Point - Indicative Birkhill Wood Substation Location
- Onshore Converter Station Zone Area of Search (3km Buffer)

Key Planning Applications within the Onshore Converter Station Area of Search

- North Humber to High Marnham Onshore Infrastructure Development Area
- Hornsea 4 Onshore Infrastructure Development Area
- Dogger Bank South Onshore Infrastructure Development Area
- Jocks' Lodge
- Creyke Beck Solar Farm

Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Onshore Converter Station Zone - Area of Search - Sheet 2 of 2

Figure: 5-14
Drawing No: PC6250-RHD-XX-OF-DR-GS-0181

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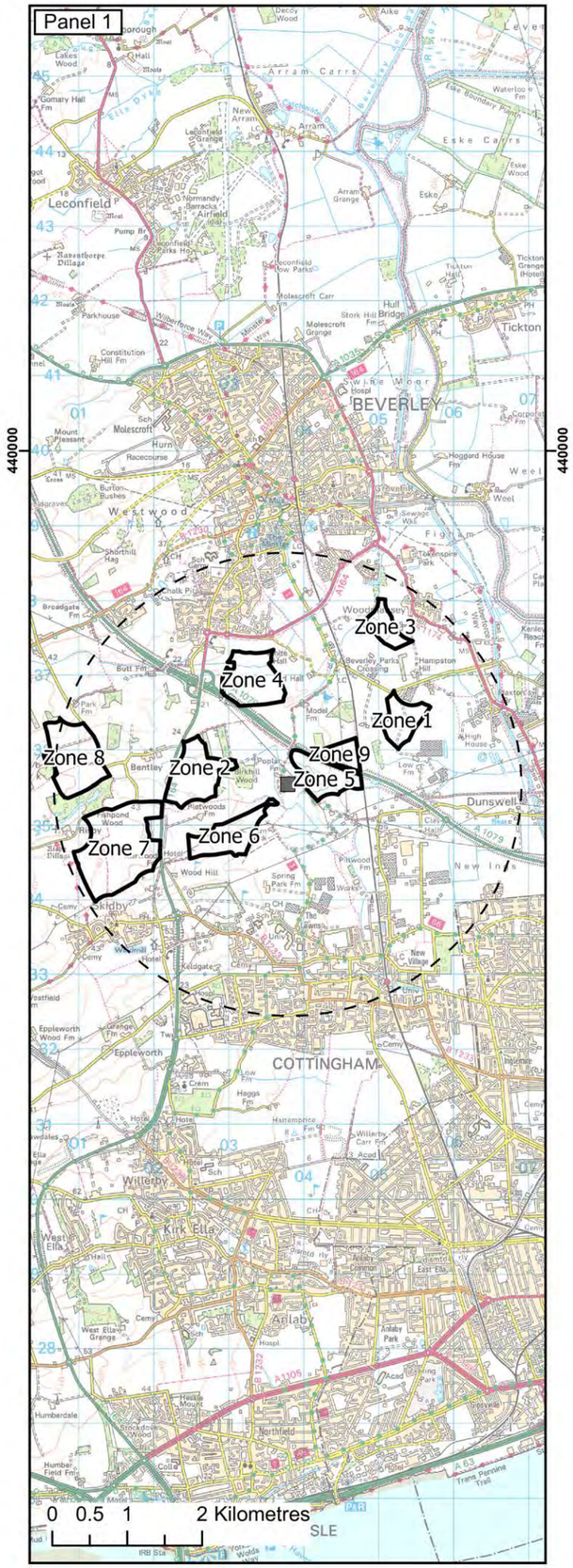

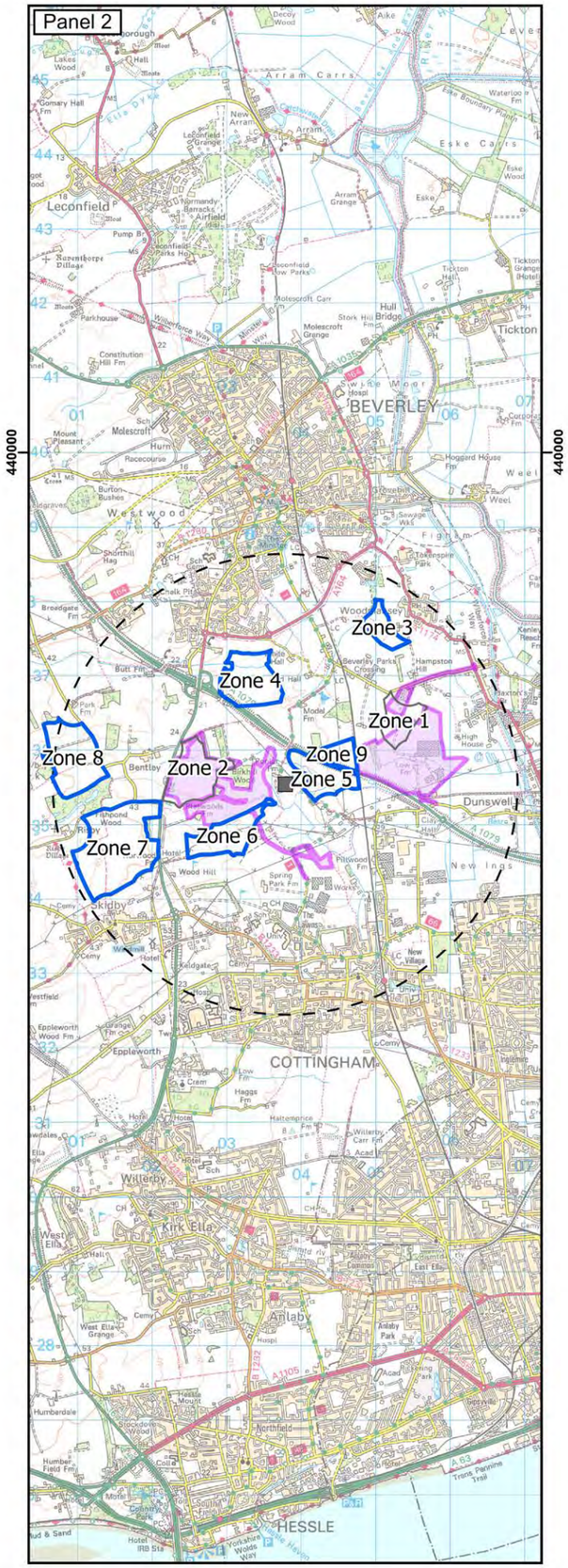

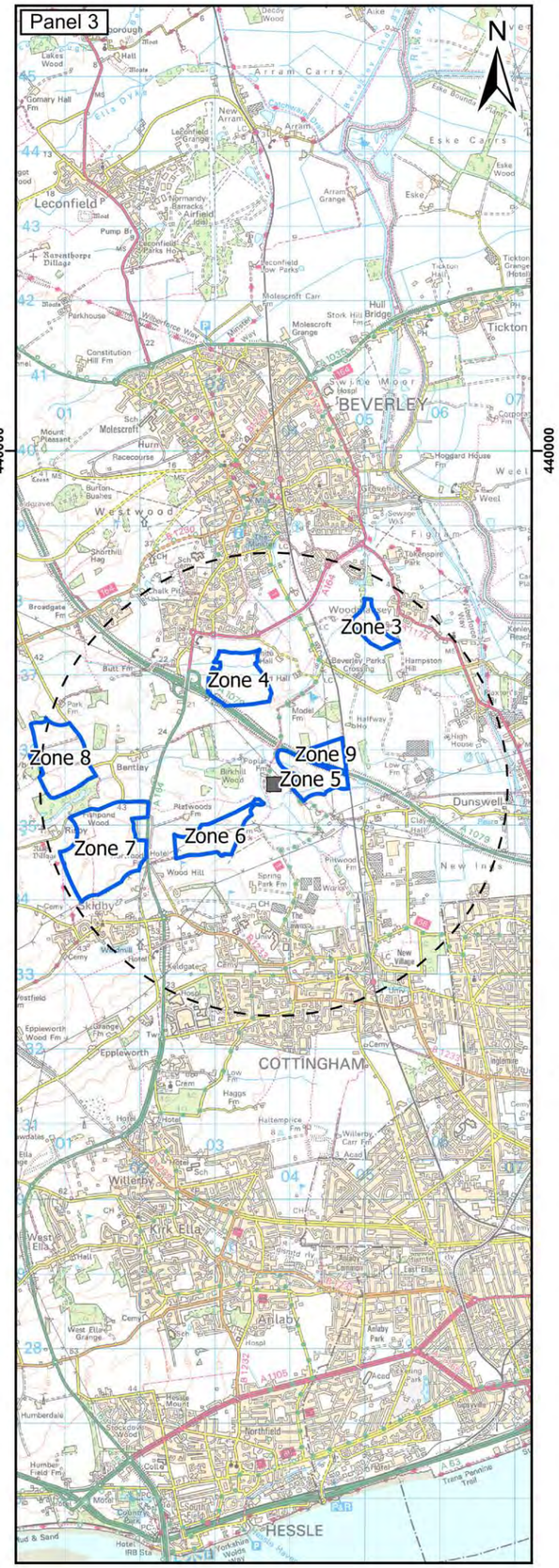

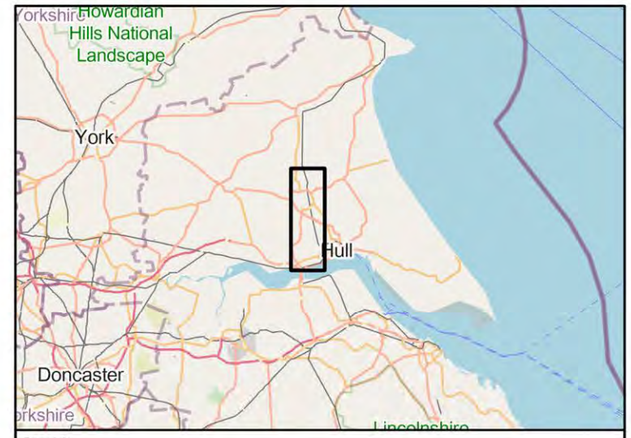

Panel 1:

- Initial Onshore Converter Station Zone Options
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Panel 2:

- Onshore Converter Station Zone Long List Options Taken Forward at Long Listing Stage
- Onshore Converter Station Zone Options Excluded at Long Listing Stage
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Key Constraints

- Approved Planning Application

Panel 3:

- Onshore Converter Station Zone Long List Options
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Onshore Converter Station Zone - Long List Options

Figure: 5-15

Drawing No: PC6250-RHD-XX-OF-DR-GS-0182

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Co-ordinate system: British National Grid

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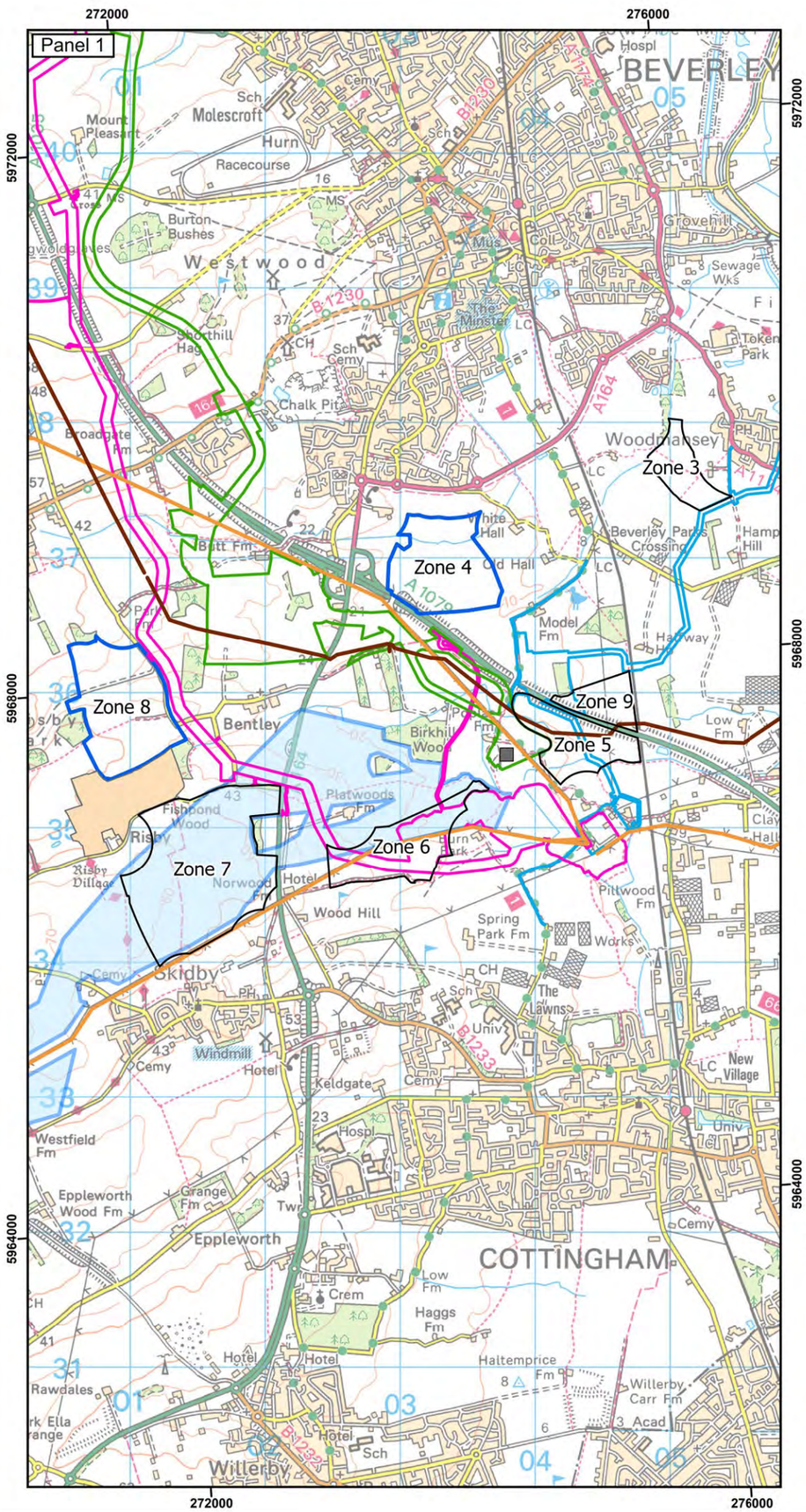
5.11.4 Identification of Onshore Converter Station Zone Short List Options for Scoping

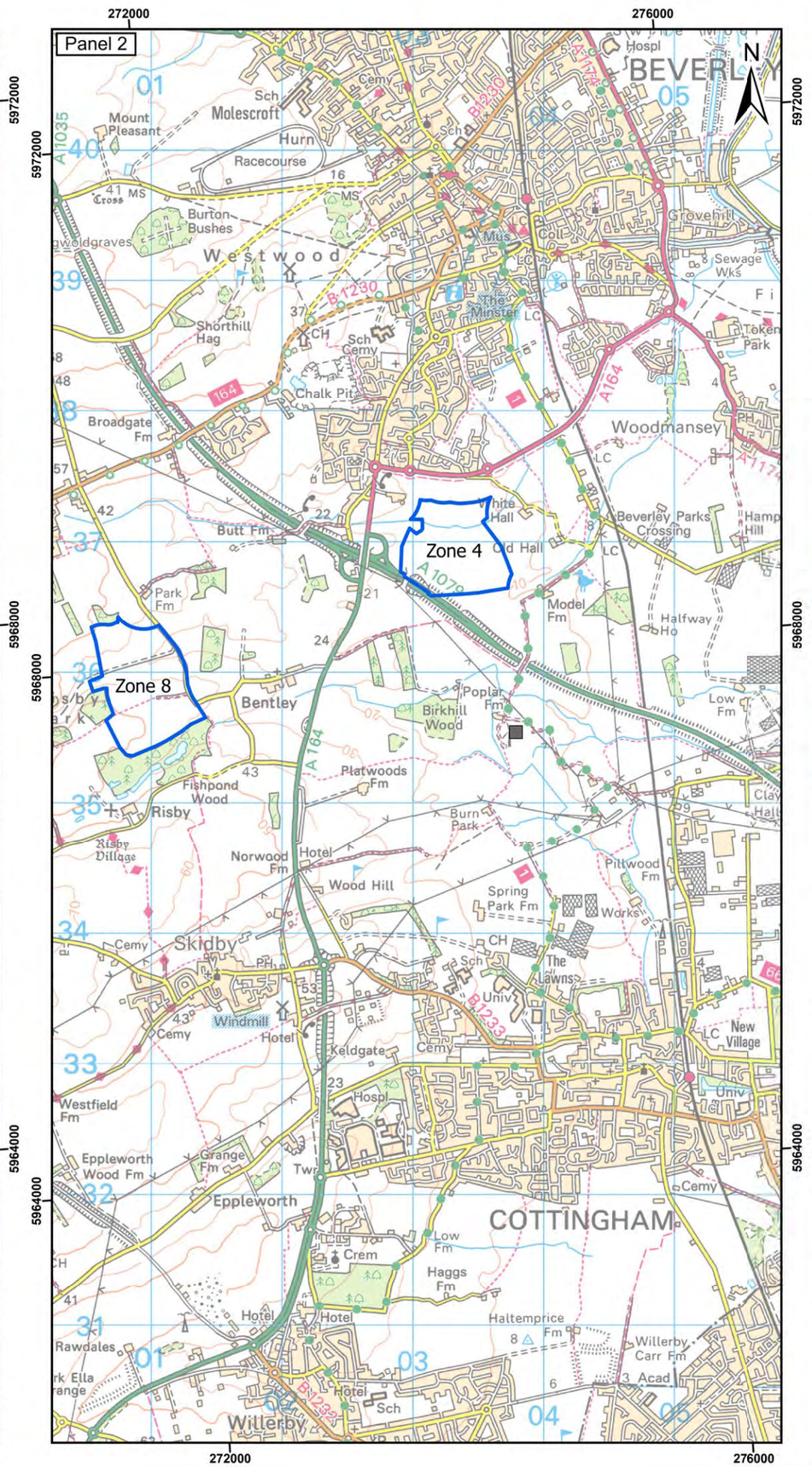
107. Based on the environmental and engineering risks identified during the BRAG assessment, five OCS zone options were discounted, as described in **Table 5-14** and shown on **Panel 1** of **Figure 5-16**. This resulted in two options (Zone 4 and Zone 8) being taken forward to the short list as shown on **Panel 2** of **Figure 5-16**.

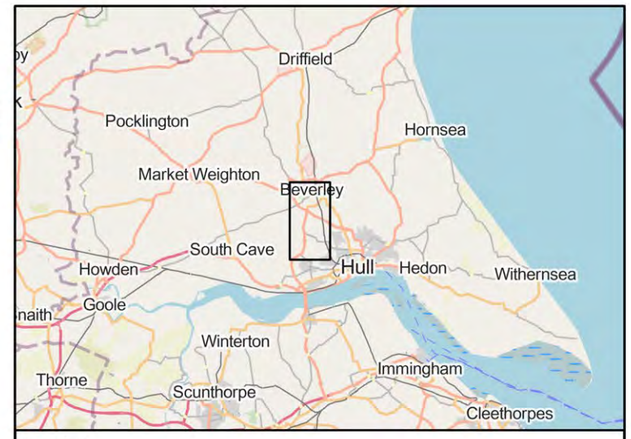
108. At the EIA scoping stage, the Onshore Scoping Area (Royal HaskoningDHV, 2024) was defined as a broad area to accommodate these short listed OCS zone options, as well as additional areas between the OCS zones and Birkhill Wood Substation for routeing of onshore ECC sections to / from the zones. The Onshore Scoping Area also allowed flexibility for further site selection refinement and to potentially coordinate with other local developments post-scoping.

Table 5-14 Summary of OCS Zone Short Listing Decisions

OCS Zone Option	Decision and Rationale
Zone 3	**Excluded** due to: • Unfavourable construction and operational access, requiring extensive traffic modification works; • High risks for landscape and visual impacts due to proximity to residential properties in Woodmansey and surrounding farm buildings and a holiday park; and • Challenges with onwards onshore export cable routeing due to proximity to residential properties, planning applications and other existing infrastructure. In addition, given that all onshore ECC options via the Dunswell Pinch Point were discounted (see **Section 5.10.4**), the remaining options approach the OCS zone AoS from the west of Beverley, and Zone 3 would require a longer corridor length and additional obstacle crossings.
Zone 4	**Included** due to relatively low environmental risks and opportunity to locate project infrastructure in proximity to other existing and planned infrastructure developments (e.g. DBA & DBB onshore converter station, National Grid substations and overhead lines) and minimise landscape and visual impacts.
Zone 5	**Excluded** due to: • Unfavourable construction and operational access, requiring extensive traffic modification works; • High potential for buried archaeology based on probable prehistoric square barrow cemetery and two ring ditches within the zone; • Interactions with Dogger Bank A & B onshore export cables, regional high pressure gas pipeline, INEOS/SABIC ethylene pipeline and high voltage overhead line; and • Unavoidable overlap with Flood Zones 2 and 3 and areas with high-risk surface water flooding; and • Multiple constraints within the zone resulting in insufficient land.
Zone 6	**Excluded** due to: • Unfavourable construction and operational access, requiring extensive traffic modification works; • Interactions with Hornsea Four onshore export cables presenting constructability risks and extra-high voltage overhead line; • Potential interactions with proposed overhead lines by the NGET's North Humber to High Marnham development and below-ground infrastructure associated with an approved solar farm planning application; and • Multiple constraints within the zone resulting in insufficient land.
Zone 7	**Excluded** due to: • High risk for landscape and visual impacts due to proximity to residential properties in Skidby. Land within the zone is elevated and flat with open views, and therefore there is limited opportunities for screening; and • High risk for direct visibility from designated heritage assets (Risby Hall Registered Park and Garden and listed buildings).
Zone 8	**Included** as the zone is relatively unconstrained and provides greater engineering flexibility. While Zone 8 has similar landscape and visual and heritage setting constraints as Zone 7, it was considered that the landform and existing woodlands to the south of the zone could be explored through the EIA process to mitigate landscape and visual impacts.
Zone 9	**Excluded** due to: • Interactions with INEOS/SABIC ethylene pipeline, regional high pressure gas pipeline and high voltage overhead line; • Overlap with Flood Zones 2 and 3 and areas with high-risk surface water flooding; and • Multiple constraints within the zone resulting in insufficient land.







Panel 1:

- Onshore Converter Station Zone Short List Options
- Onshore Converter Station Zone Options Excluded at Short Listing Stage
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Key Constraints

- INEOS/SABIC ethylene pipeline
- National Grid Overhead Lines
- Hornsea 4 Onshore Infrastructure Development Area
- Dogger Bank A & B Onshore Infrastructure Development Area
- Dogger Bank South Onshore Infrastructure Development Area
- Risby Hall Registered Park and Garden
- North Humber to High Marnham Onshore Infrastructure Development Area

Panel 2:

- Onshore Converter Station Zone Short List Options
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project:

Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:

Onshore Converter Station Zone - Short List Options

Figure: 5-16

Drawing No: PC6250-RHD-XX-OF-DR-GS-0183

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Co-ordinate system: British National Grid

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5.11.4.1 Optionality in Onshore Export Cable Corridor Sections for the OCS Zones

109. Following short listing of the OCS zone options, onshore ECC options within the OCS zone AoS were identified. As Zone 8 is located on the western boundary of the OCS zone AoS, no additional corridor was required to connect the HVDC onshore export cables into the zone. Zone 4 is located further within the OCS zone AoS, therefore, an onshore ECC was required to site the remaining length of HVDC onshore export cables to connect into the zone. From both OCS zones, an onshore ECC was also required to site HVAC onshore export cables for the onward HVAC connection into Birkhill Wood Substation.

110. Due to the number of constraints present within the OCS zone AoS, particularly due to a concentration of existing and planned developments (the location of major infrastructure developments in the area are shown on **Figure 5-14**), 100m was used as the maximum corridor width to identify broad corridors to accommodate both the temporary construction and permanent infrastructure footprint. The site selection principles discussed in **Section 5.11.2** were also used for routeing of these onshore ECC sections. Whilst avoiding environmental and engineering constraints in the first instance remain the aim of the site selection principles behind the corridor routeing exercise, due to the highly constrained nature of the area, there were limited options available for complete avoidance of constraints. Instead, the routeing exercise examined opportunities to minimise interactions with the environmental and engineering constraints whilst also ensuring that a sufficient number of technically feasible options could be identified (e.g. sufficient space for corridor routeing, complexity of crossings with third party assets).

111. Based on constraints mapping, two onshore ECC options were identified and taken forward to the BRAG assessment and illustrated on **Figure 5-17**. Both options enter the OCS zone AoS via Zone 8 before branching into a northern and southern corridor section. The northern corridor section connects into Zone 4 at two potential locations before terminating at the Birkhill Wood Substation and is therefore being considered for both OCS zones. The southern corridor section connects directly into Birkhill Wood Substation and is only being considered for Zone 8.

112. A review of the BRAG assessment outcomes determined that both the northern and southern corridor sections have generally low environmental risks. However, potential engineering pinch points due to interactions with existing utilities and planned infrastructure and land constraints raised during non-statutory consultation were identified for both corridor sections.

113. Further engineering studies are required to determine the preferred option between the northern and southern corridor sections, as this is dependent on the decision-making between Zone 4 and Zone 8. Therefore, both options are retained in the Onshore Development Area further refinement between PEIR publication and the DCO application submission.

114. At this stage, the onshore ECC boundary around the Birkhill Wood Substation was widened to allow flexibility for micro-siting the HVAC onshore export cables into the grid connection point and account for uncertainty regarding the precise location and layout of the substation, which will be determined by NGET. As discussed in **Section 37**, land required for ancillary infrastructure was added to the Onshore Development Area, which is subject to refinement once further information on the engineering design and access strategy becomes available. The refinement process to date is illustrated on **Sheet 1** of **Figure 5-18**, and the resulting Onshore Development Area is shown on **Sheet 2** of **Figure 5-18**.

5.11.5 Identification and Refinement of the Preferred Onshore Converter Station Zone Options for PEIR

115. The two short listed OCS zone options (Zone 4 and Zone 8) were presented to technical stakeholders at a Site Selection ETG meeting held on the 7th August 2024, and a summary of their feedback is presented in **Table 5-15**. The key constraints discussed in the table are shown on **Panel 2** of **Figure 5-16**. In addition, both OCS zone options were also presented at the non-statutory consultation held between 10th September to 22nd October 2024.

Table 5-15 Summary of Site Selection ETG Comments on Short Listed OCS Zone Options

Stakeholder	Comment
East Riding of Yorkshire Council	**Zone 4:** Views from Beverley Minster should be considered if this option is taken forward.
Environment Agency	**Zone 4:** This zone is located within Flood Zones 2 and 3. **Zone 8:** This zone is located within Flood Zone 1 and has less exposure to flood risk than Zone 4.
Historic England	**Zone 4:** Further investigation required into the potential impacts on the heritage setting of Beverley Minster and listed buildings at Woodmansey Old Hall and White Hall. **Zone 8:** Further investigation required into the potential impacts on the historic landscape character and the heritage setting of Risby Hall Registered Park and Garden, Walkington Conservation Area and listed buildings in the area.

116. Following a review of stakeholder comments received from the ETG meetings and the feedback received during the non-statutory consultation, both OCS zone options were retained in the Onshore Development Area for PEIR. At this stage, further investigation into the scale of environmental, engineering and land risks and their mitigation requirements is required to conclude a preferred option. A summary of the information gathered to date on Zone 4 and Zone 8 is presented in **Table 5-16**.

Table 5-16 Summary of Site Selection Considerations for OCS Zones 4 and 8

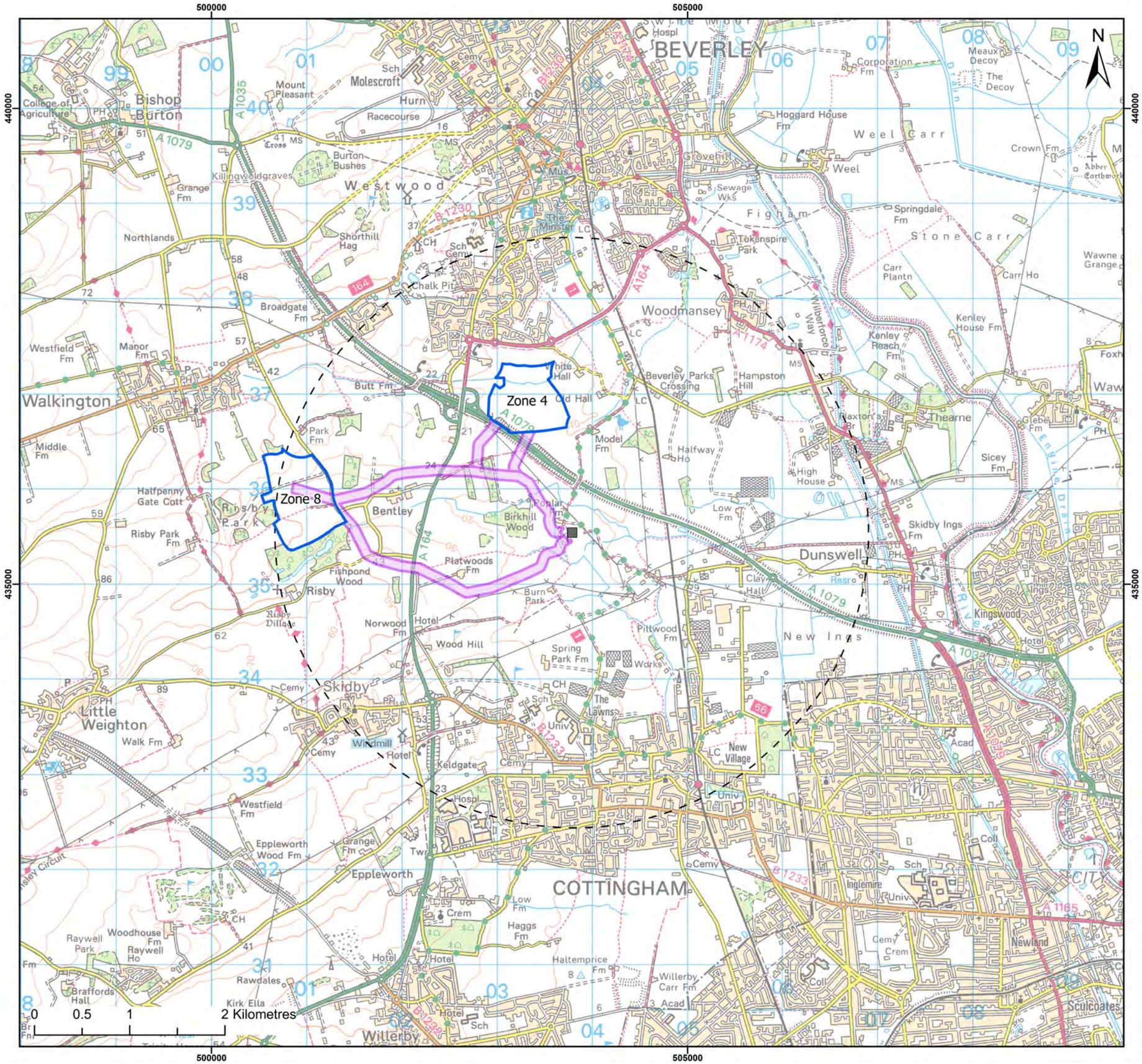
OCS Zone Option	Consideration
Zone 4	**Environmental:** • Partial overlap with Flood Zones 2 and 3 and areas with high-risk surface water flooding; • Potential for direct visibility from designated heritage assets; and • Potential for landscape and visual impacts due to residential properties located in Beverley. **Engineering:** • Only the northern export cable corridor section is viable for this zone. Challenges with onshore export cable routeing into and from the zone due to interactions with Dogger Bank South onshore export cables, INEOS/SABIC ethylene pipeline, A-road, Jock's Lodge highway improvement scheme, national high pressure gas pipeline and proposed solar farm developments; and • Constraints due to requirements to micro-site around high voltage overhead lines and national high pressure gas pipeline within the zone.
Zone 8	**Environmental:** • Partial overlap with areas with high-risk surface water flooding; • Potential for direct visibility from designated heritage assets; • Potential for landscape and visual impacts due to location within the Yorkshire Wolds ILA and proximity to residential properties located in Bentley and Walkington; and • Overlap with Mineral Safeguarding Area and Environmental Land Management Schemes. **Engineering:** • The northern corridor section interacts with other third-party assets such as Dogger Bank South onshore export cables, A-road, Jock's Lodge highway improvement scheme and proposed solar farm development; • The southern corridor section interacts with other third-party assets such as Hornsea Four onshore export cables and onshore substation, Jock's Lodge highway improvement scheme, regional high pressure gas pipeline, proposed overhead lines by the NGET's North Humber to High Marnham development and proposed solar farm development; • Topographical constraints within the zone with more earthworks requirement but may also provide opportunity to lower infrastructure within the surrounding landscape; and • Fewer utilities within the zone, providing fewer constraints for micro-siting infrastructure.

117. The size of the OCS zone options was also retained to allow micro-siting and technical layout configuration opportunities to be further explored following more information gathering. The following site selection principles will be considered further during refinement of the OCS zone options at the ES stage, which align with the principles in the Horlock Rules:

- Locate the zone as close as practicable to land parcel boundaries to minimise impacts to landowners and agricultural use;
- Consider site topography and layout to take advantage of screening provided by landform and existing features and site permanent infrastructure into the existing landscape, minimising landscape and visual and heritage setting impacts;
- Minimise interactions with existing utilities and maintain sufficient setback distances from major utilities;
- Avoid and minimise impacts to watercourses (e.g. main rivers, IDB maintained drains and field ditches) and other surface and groundwater resources;
- Avoid and minimise impacts to PRoW and cycle routes;
- Minimise removal of hedgerows;
- Avoid and minimise impacts to UK Habitats of Principal Importance and Irreplaceable Habitats; and
- Minimise impacts to Mineral Safeguarding Areas and LGS.

118. As discussed in **Section 37**, land required for ancillary infrastructure were added to the Onshore Development Area, which are subject to refinement once further information on the engineering design and access strategy becomes available. Two temporary construction compounds will be required to support the OCS and co-located ESBI construction, however, their footprints are assumed to be located entirely within the OCS zone. Further details on accesses to the OCS zones are discussed in **Chapter 26 Traffic and Transport**.

119. The refinement process to date is illustrated on **Sheet 1** of **Figure 5-18**, and the resulting Onshore Development Area for the PEIR is shown on **Sheet 2** of **Figure 5-18**.



Legend:

- Onshore Converter Station Zone Short List Options
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Onshore Export Cable Corridor Options to/from Onshore Converter Station Zones
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Export Cable Corridor Options within Onshore Converter Station Zone Area of Search

Figure: 5-17

Drawing No: PC6250-RHD-XX-OF-DR-GS-0184

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Co-ordinate system: British National Grid

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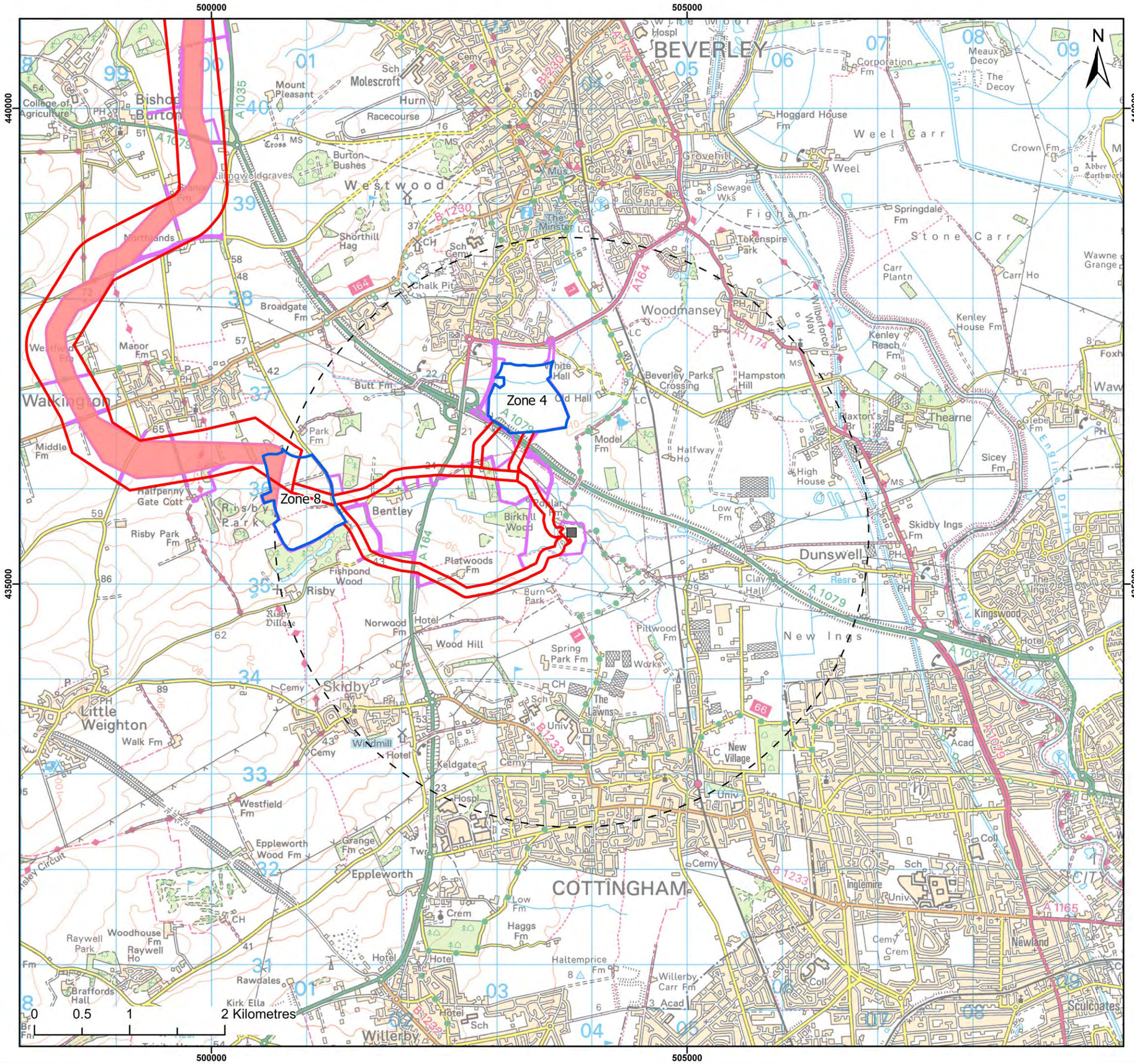

Legend:

- Onshore Export Cable Corridor Options Taken Forward to Refinement for Non-Statutory Consultation
- Onshore Converter Station Zone Options Taken Forward to Non-Statutory Consultation
- Modifications During Refinement Prior to Non-Statutory Consultation
- Modifications During PEIR Refinement Stage
- Onshore Converter Station Zone Area of Search (3km Buffer)
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project:
Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title:
Onshore Converter Station Zone Refinement - Onshore Development Area for PEIR - Sheet 1 of 2

Figure: 5-18
Drawing No: PC6250-RHD-XX-OF-DR-GS-0185

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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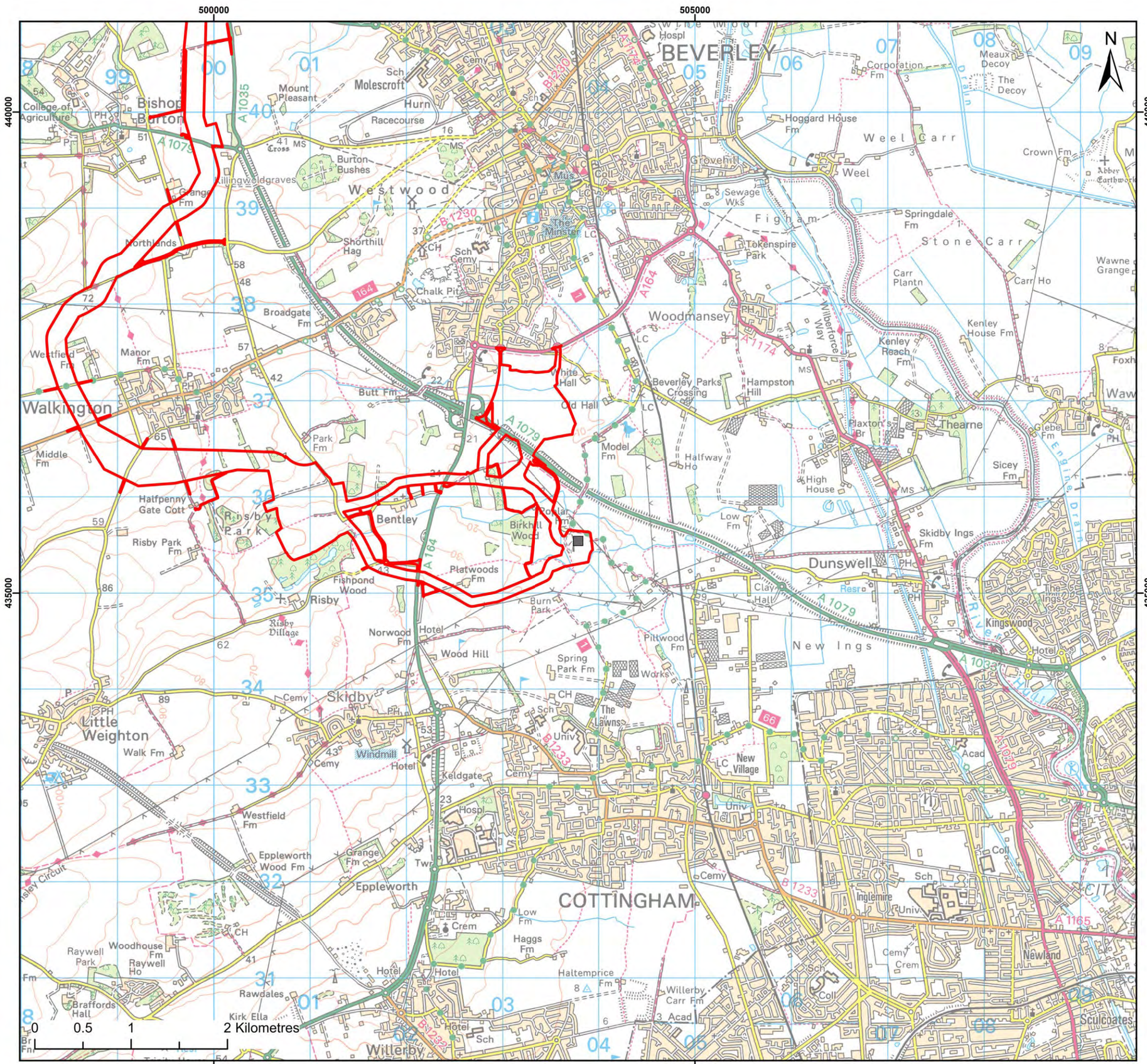

Legend:

- Onshore Development Area for PEIR
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: Onshore Converter Station Zone Refinement - Onshore Development Area for PEIR - Sheet 2 of 2

Figure: 5-18

Drawing No: PC6250-RHD-XX-OF-DR-GS-0185

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Co-ordinate system: British National Grid

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5.12 Summary and Conclusions

120. The site selection process undertaken to date has enabled the identification and refinement of preferred option(s) for siting the Project's infrastructure components to the point of the PEIR assessment. The offshore and onshore development areas for PEIR are shown on **Figure 5-19**. This process has been ongoing since the Project's inception and involved iterative and holistic decision-making supported by a multi-disciplinary team of environmental, consenting, engineering, land and stakeholder engagement specialists. In addition, this process has been informed by relevant feedback received through technical and public consultation with stakeholders and local communities.

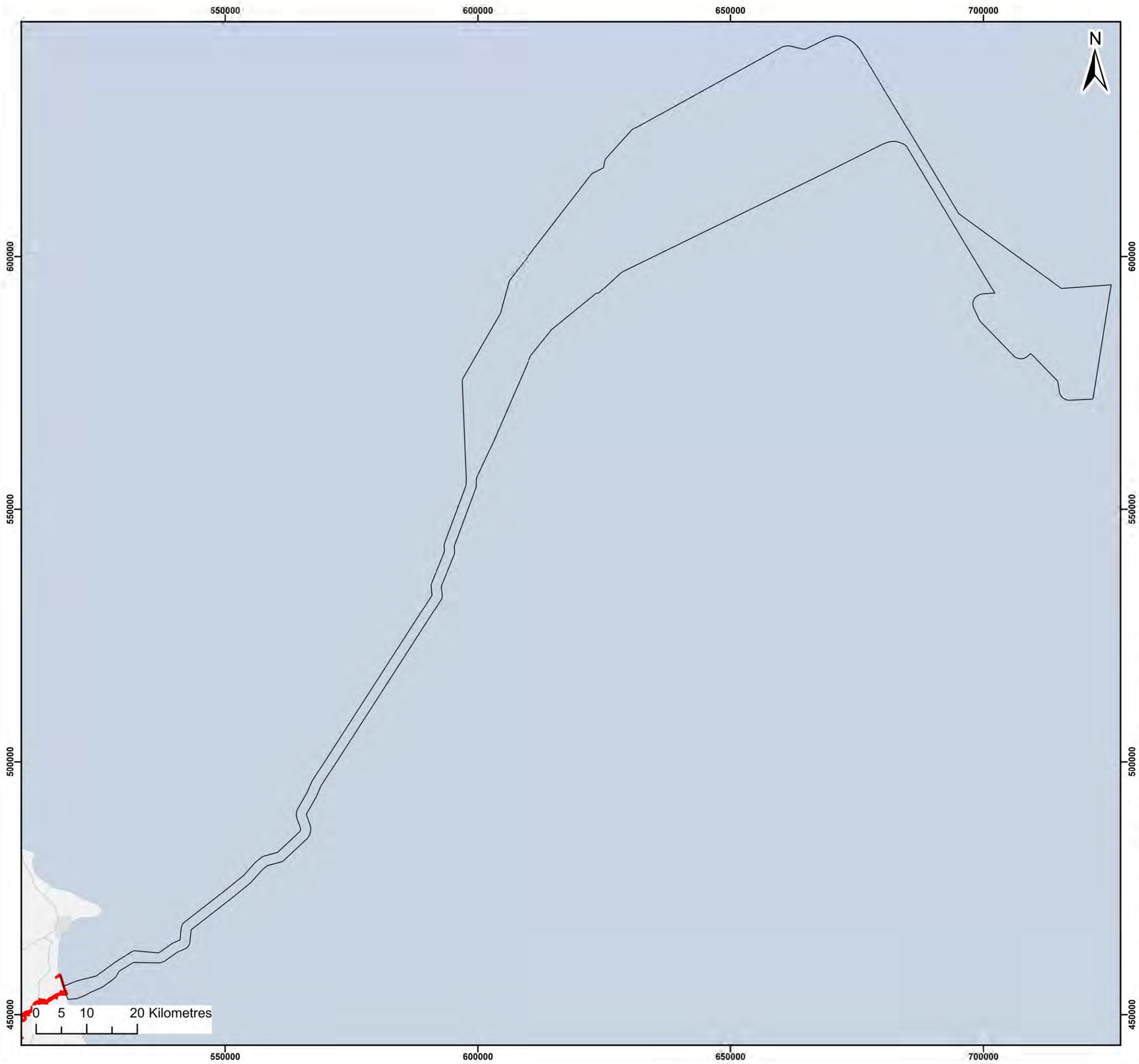
121. Through the site selection principles and consideration of alternatives, the avoidance and minimisation of impacts on the environment and communities have been embedded into the project design. Preferences and concerns raised by stakeholders and local communities have been considered and where possible and practicable, incorporated into site selection decision-making and refinements to the development area.

5.12.1 Next Steps

122. The site selection process is ongoing and will continue to inform preparation of the ES, which forms part of the DCO application submission. Following statutory consultation on the PEIR, this chapter will be updated in full consideration of stakeholder feedback, refinements to the project design envelope, site-specific surveys and data collection and outcomes of the EIA process.

123. The final results of the site selection process and consideration of alternatives will be presented in the ES and will highlight any further site selection decision-making and refinements leading to the Offshore and Onshore Development Areas included in the DCO application. These may include but are not limited to:

- Refinement of the preferred offshore ECC option, pending results of site-specific geophysical and geotechnical surveys and further information on a potential extension to the Dogger Bank SAC.
- Identification of the preferred onshore ECC option within the OCS zone AoS and refinement to the onshore ECC width.
- Identification and refinement of the preferred OCS zone option and consideration of layout configurations.
- Identification of the preferred locations for ancillary onshore infrastructure, including temporary construction compounds, construction and O&M accesses.



Legend:

- Onshore Development Area for PEIR
- Offshore Development Area for PEIR
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: PEIR Stage Offshore and Onshore Development Areas - Sheet 1 of 2

Figure: 5-19

Drawing No: PC6250-RHD-XX-OF-DR-GS-0332

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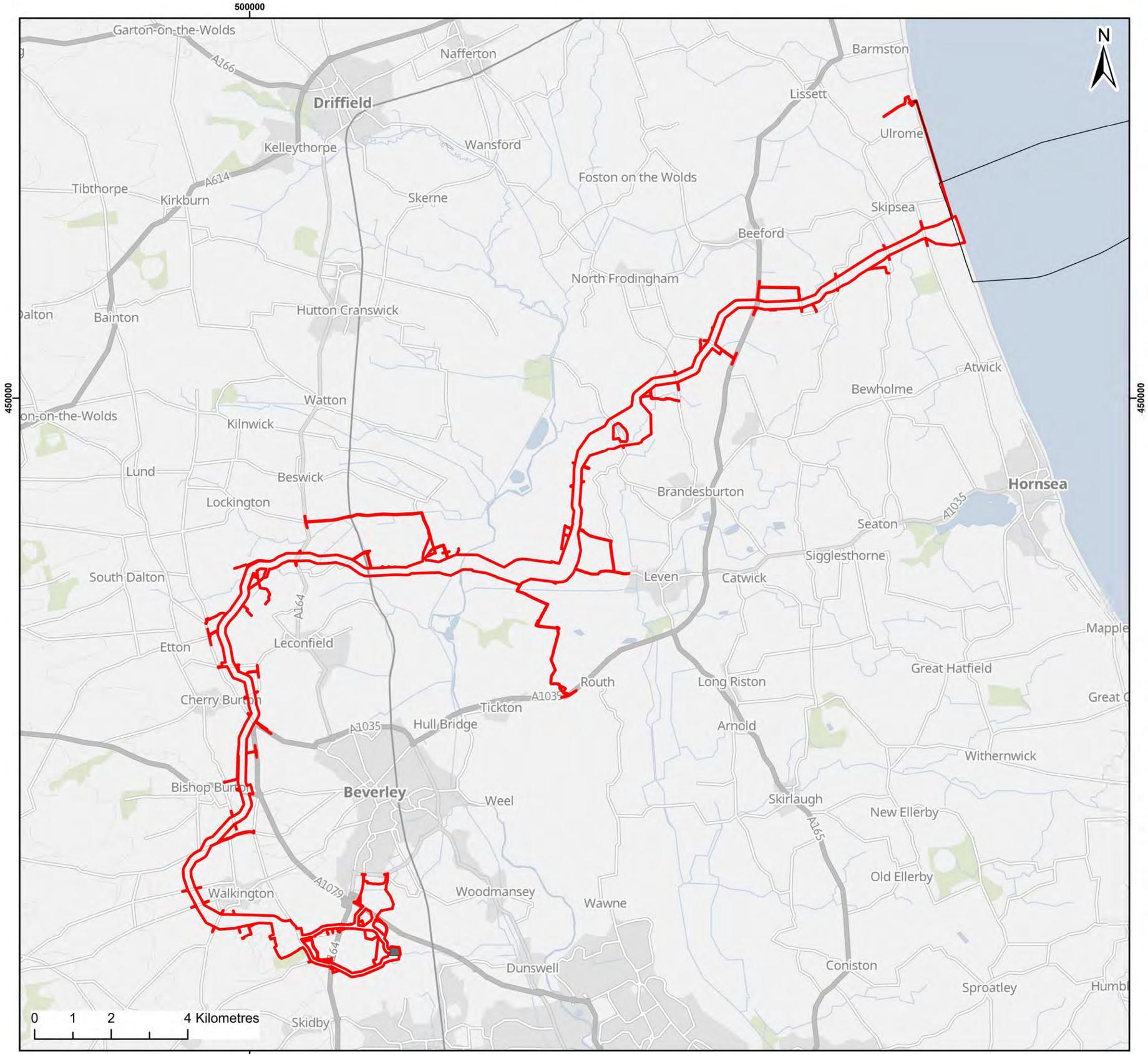

Legend:

- Onshore Development Area for PEIR
- Offshore Development Area for PEIR
- Grid Connection Point - Indicative Birkhill Wood Substation Location

Project: Dogger Bank D Offshore Wind Farm

DOGGER BANK WIND FARM

Title: PEIR Stage Offshore and Onshore Development Areas - Sheet 2 of 2

Figure: 5-19

Drawing No: PC6250-RHD-XX-OF-DR-GS-0332

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Co-ordinate system: British National Grid

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Appendix A – Constraints Considered in the Site Selection Process

Category	Constraint
Onshore	
Landscape and Ecology	• Ramsar Sites; • Special Areas of Conservation (SAC); and • Special Protection Areas (SPA). • Sites of Special Scientific Interest (SSSI); • Royal Society for the Protection of Birds (RSPB) Reserves; • Ancient Woodlands; • Important Bird Areas (IBA); • National Nature Reserves (NNR); • National Parks and Trails; • National Landscapes; • Heritage Coasts; • Local Nature Reserves (LNR); • Local Wildlife Sites (LWS); • Country Parks; • Yorkshire Wildlife Trust Nature Reserves; • Important Landscape Areas (ILA); and • UK Habitats of Principal Importance and Irreplaceable Habitats.
Archaeology and Cultural Heritage	• Battlefields; • Listed Buildings; • Conservation Areas; • Scheduled Monuments; • Registered Parks and Gardens (RPG); • World Heritage Sites;
Hydrology and Flood Risk	• Main Rivers; • Internal Drainage Board (IDB) maintained watercourses; • Other Ordinary Watercourses such as field drains; • Flood Zones for Coastal and River Flooding; • Flood Risks from Surface Water Flooding; • Flood Risks from Reservoir Flooding; and • Source Protection Zones (SPZ).
Geology	• Onshore Geology; • Local Geological Sites (LGS); and • Onshore Topography.
Land Use and Planning	• Roads, including motorways, classified and unclassified roads; • Railway Lines; • Bridges, Tunnels and Stations; • Utilities, including telecommunications, substations, sewage treatment plants, gas storage facilities and valve compounds, overhead lines and other power lines, gas mains and other pipelines. • Agricultural Land Classification (ALC) Grades; • Airfields, Airports and Helidecks; • Military Practice and Exercise Areas (PEXA). • Authorised Landfills; • Historic Landfills; • Historic Mining Activities; • Mineral Safeguarding Areas; • Local Plan Designations; • Residential Properties; • Existing Developments and Planned Developments, including local planning applications and Nationally Significant Infrastructure Projects (NSIP); • Tourism and Recreation Assets, such as golf courses, camping sites, caravan and holiday parks, Public Rights of Way (PRoW), cycle routes and open access lands; and • Community Assets, such as allotments, cemeteries and schools.

Category	Constraint
Offshore	
Ecology	• Special Areas of Conservation (SAC); • Special Protection Areas (SPA). • Marine Conservation Zones (MCZ); • Shellfish Classification Zones; • Fish Spawning Grounds; and • Marine Habitats, including Annex I reefs and sandbanks.
Archaeology and Cultural Heritage	• Protected Wrecks
Seabed	• Wrecks and Obstructions; • Bathymetry; and • Offshore Geology.
Other Marine Users	• Telecommunications and Power Cables; • Designated Bathing Waters; • Military Practice and Exercise Areas (PEXA); • Fishing Intensity; • Shipping Vessel Density; • Disposal Sites; • Marine Foul Grounds; • Marine Aggregate Sites; • Offshore Wind Leasing Sites; • Carbon Capture and Storage (CCS) Sites and Pipelines; • Meteorological and Oceanographic Equipment Agreements; • Planned Developments, including marine licenses and Nationally Significant Infrastructure Projects (NSIP); and • Offshore Oil and Gas Pipelines, Wells, Hydrocarbon Fields and Licence Blocks and Other Oil & Gas Infrastructure.

List of Figures, Tables and Plates

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List of Acronyms

Acronym	Definition
AoS	Areas of Search
BGS	British Geological Survey
BRAG	Black-Red-Amber-Green Assessment
DBA	Dogger Bank A Offshore Wind Farm
DBB	Dogger Bank B Offshore Wind Farm
DBC	Dogger Bank C Offshore Wind Farm
DBD	Dogger Bank D Offshore Wind Farm
DCO	Development Consent Order
DESNZ	Department of Energy Security and Net Zero
ECC	Export cable corridors
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESBI	Energy Storage and Balancing Infrastructure
ETG	Expert Topic Group
HND	Holistic Network Design
HRA	Habitats Regulation Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IBA	Important Bird Area
IDB	Internal Drainage Board
IEMA	Institute of Environmental Management and Assessment
LGS	Local Geological Sites
LWS	Local Wildlife Sites
MCA	Marine Conservation Zone
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MPA	Marine Protected Area
NESO	National Energy System Operator
NGESO	National Grid Electricity System Operator
NGET	National Grid Electricity Transmission
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
O&M	Operation and Maintenance
OCS	Onshore Converter Station
OHA	Offshore Hybrid Assets
OTNR	Offshore Transmission Network Review
PEIR	Preliminary Environmental Information Report
PEXA	Military Practice and Exercise Areas
PRoW	Public Rights of Way
RPG	Registered Parks and Gardens
SAC	Special Area of Conservation
SPA	Special Protected Area
SSSI	Site of Special Scientific Interest
UXO	Unexploded Ordnance