RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Preliminary Environmental Information Report

Chapter 21 – Land Use

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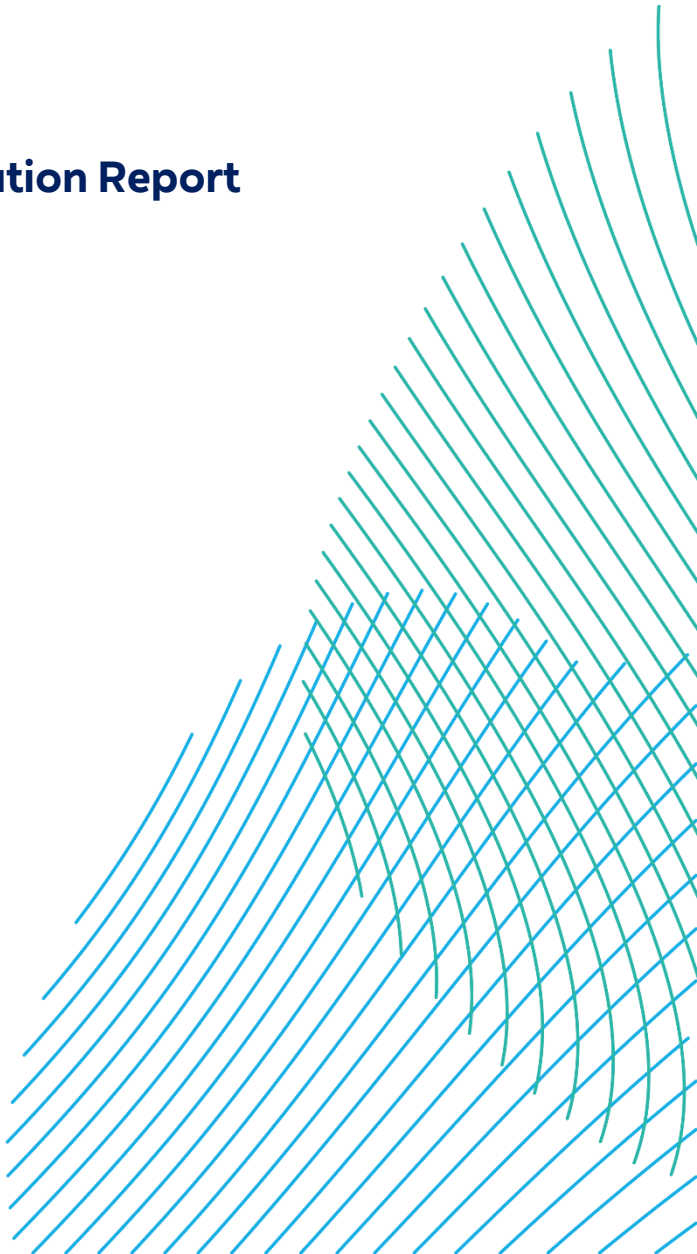

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Glossary

Term	Definition
Cable Construction Compound	Area set aside to facilitate construction of the onshore export cables. These will be located adjacent to the onshore export cable corridor, with access to the highway.
Haul Road	The track used by traffic to access different sections of the onshore export cable corridor for construction.
Horizontal Directional Drilling (HDD)	HDD is a trenchless technique to bring the offshore cables ashore at the landfall and can be used for crossing other obstacles such as roads, railways and watercourses onshore.
Dogger Bank South (DBS) Offshore Wind Farms	The collective name for the two Projects, DBS East and DBS West.
Jointing Bays	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The point on the coastline at which the offshore export cables are brought onshore, connecting to the onshore export cables at the Transition Joint Bay.
Link Boxes	Below ground structures housing cable equipment, located along the onshore export cable corridor alongside the jointing bays.
Onshore Development Area	The Onshore Development Area for PEIR is the boundary within which all onshore infrastructure required for the Projects will be located including landfall, onshore export cable route, accesses, construction compounds and onshore substations. The Onshore Development Area is to be refined through the consultation and engineering review process.

Term	Definition
Onshore Export Cable Corridor	This is the area which includes cable trenches, haul roads, spoil storage areas, and limits of deviation for micro-siting. For assessment purposes, the cable corridor does not include the onshore substations, Transition Joint Bays or temporary access routes; but includes construction compounds (purely for the cable route).
Onshore Export Cables	Onshore export cables take the electricity from the Transition Joint Bay to the onshore substations.
Onshore Substations	A compound containing electrical equipment required to transform and stabilise electricity generated by the Projects so that it can be connected to the electricity transmission network. There will be one onshore substation for each Project.
Onshore Substation Zone	Parcels of land within the Onshore Development Area where the onshore substation infrastructure (including the haul roads, temporary construction compounds and associated cable routeing) may be located.
Transition Joint Bay (TJB)	The Transition Joint Bay (TJB) is an underground structure at the landfall that houses the joints between the offshore export cables and the onshore export cables.
The Applicant	RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited as the owners of DBS West and DBS East respectively are the named undertakers that will have the benefit of the Development Consent Order. References in this document to obligations on, or commitments by, 'the Applicant' are given on behalf of RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited.
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South offshore wind farms).

Acronyms

Term	Definition
ALC	Agricultural Land Classification
ALO	Agricultural Liaison Officer
BMV	Best Most Versatile
CRoW	Countryside and Rights of Way Act 2000
CSS	Countryside Stewardship Scheme
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ELM	Environmental Land Management
ELS	Entry Level Stewardship
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HLS	Higher-Level Stewardship
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IPC	Infrastructure Planning Commission
LPA	Local Planning Authority
LWS	Local Wildlife Site
MAFF	Ministry of Agriculture, Fisheries and Food
MHWS	Mean High Water Springs

Term	Definition
NE	Natural England
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NSRI	National Soil Research Institute
OELS	Organic Entry Level Stewardship
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
PRoW	Public Rights of Way

21 Land Use

21.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) considers the likely significant effects of the Projects on Land Use. The chapter provides an overview of the existing environment for the proposed Onshore Development Area, followed by an assessment of likely significant effects for the construction, operation, and decommissioning phases of the Projects.

2. The assessment should be read in conjunction with the following linked chapters:

- **Chapter 18 Terrestrial Ecology and Ornithology**;
- **Chapter 19 Geology and Land Quality**;
- **Chapter 20 Flood Risk and Hydrology**;
- **Chapter 22 Onshore Archaeology and Cultural Heritage**;
- **Chapter 23 Landscape and Visual Impact Assessment**;
- **Chapter 24 Traffic and Transport**;
- **Chapter 25 Noise**;
- **Chapter 27 Human Health**;
- **Chapter 28 Socio-Economics**; and
- **Chapter 29 Tourism and Recreation**.

21.2 Consultation

3. Consultation with regard to Land Use has been undertaken in line with the general process described in **Chapter 6 EIA Methodology**. The key elements of consultation to date have included scoping. The feedback received has been considered in preparing the PEIR. **Table 21-1** provides a summary of how the consultation responses received to date have influenced the approach that has been taken.

4. This chapter will be updated following consultation on PEIR in order to produce the final assessment that will be submitted with the Development Consent Order (DCO) application. Full details of the consultation process will also be presented in the Consultation Report alongside the DCO application.

Table 21-1 Consultation Responses

Comment	Project Response
Planning Inspectorate / Scoping Responses 02/09/2022	
While the intention to design the buried cable systems to minimise heat loss is acknowledged, in the absence of any detailed information about the measures adopted and predicted emissions it is not possible to agree to scope out soil heating from the ES. The ES should include the necessary information to demonstrate impacts can be avoided or reduced to exclude significant effects, or provide an assessment.	The potential impacts associated with soil heating during the operational phase of the Projects is discussed within section 21.6.2.6. The impact assessment considers that there is no significant impact in relation to soil heating during the operational phases of DBS East or DBS West in isolation or together. Therefore, no mitigation measures will be required to reduce the significance of effect.
The Inspectorate agrees that operational loss of BMV is unlikely to result in significant effects where the BMV is fully reinstated. However, it is not known if full reinstatement will be possible along the entire buried infrastructure route. The ES should address this matter and assess any likely significant effects. The ES should be supported by details of the reinstatement plans and methodology to be employed during construction and demonstrate how these will be secured in the DCO. It is noted that operational effects from restrictions to agricultural practices around buried infrastructure is to be included in the ES assessment.	Impacts on the Best and Most Versatile (BMV) agricultural land, and potential mitigation measures, are assessed in sections 106 and 21.6.2.2. Minimisation of impacts to BMV agricultural land will be undertaken where possible. However, the predominant land cover within the Onshore Development Area is classed as BMV agricultural land, and therefore the ability to avoid use of BMV agricultural land will be extremely limited.

Comment	Project Response
The Scoping Report does not expand on its statement that erosion impacts are not anticipated during operation, e.g. with reference to landfall design or operational activities. While the Inspectorate accepts that significant effects are more likely during construction, it advises that the ES includes sufficient information to demonstrate that impacts can be discounted during operation, or make an assessment of the likely significant effects.	Potential impacts, and mitigation measures (if required), associated with erosion of the landfall are assessed within **Chapter 8 Marine Physical Processes**. Potential impacts, including mitigation measures, associated with the erosion of soils during the construction process of the Projects are assessed in section 21.6.1.3.
The comments above (ID 4.4.1) regarding reinstatement should also be considered in relation to effects on existing and future Environmental Stewardship Schemes and reported in the ES.	The potential impacts to Environmental Stewardship Schemes during the construction and operational phases of the Projects are discussed in sections 0 and 21.6.2.3. Proposed mitigation measures to reduce the significance of effect on Environmental Stewardship Schemes during construction and operation are also discussed in these sections.
While it is acknowledged that the potential for effects is most likely to arise during the construction phase, there is no discussion of operational effects in the text, e.g. in relation to maintenance of rights of access to utilities or the implications of reinstatement planting. The ES should assess operational effects on existing utilities where significant effects could occur.	Details of the utilities present within the Onshore Development Area are included within section 21.5. The potential impacts that are anticipated to occur during the operational phase of the Projects are discussed within section 21.6.2.4.

Comment	Project Response
On the basis that no permanent diversions are intended relating to buried infrastructure, the Inspectorate agrees that these matters can be scoped out of the ES. However, the ES should detail how PRoW and CRoW areas will be reinstated following construction and how these works are to be secured.	Details of Public Rights of Way (PRoW) and Countryside and Rights of Way (CRoW) Act areas present within the Onshore Development Area are included within section 21.5. Potential impacts, including mitigation measures, as a result of the construction and operation of the Projects are discussed within sections 0 and 21.6.2.5 respectively.
Paragraph 665 refers to the presence of landfill sites within the onshore study area. These are not referred to further within this chapter and as such it is not clear whether the ES will include an assessment of likely significant effects to land use arising from impacts to landfills. For clarity, the ES should identify and assess impacts to these specified land uses where significant effects are likely.	The presence, potential impacts and mitigation measures associated with landfills within the Onshore Development Area are discussed in **Chapter 19 Geology and Land Quality**.
Paragraph 678 of the Scoping Report states that no surveys are proposed to inform the land use impact assessment. The Inspectorate advises that this is kept under review and that advice from stakeholders is sought and addressed in relation to the need for surveys. The ES should include a description of any survey work, e.g., to establish agricultural land quality or the presence of utilities, relied upon for the purposes of mitigation or restoration.	Details in relation to ongoing consultation for the Projects are provided in **Chapter 7 Consultation**. Consultation with landowners, and other relevant stakeholders, will be ongoing and potential mitigation measures, including the requirement for surveys and onshore site investigation works, are discussed within section 21.6.1.

Comment	Project Response
National Grid / Scoping Responses 02/09/2022	
NGET requests to be consulted at the earliest stages to ensure that the most appropriate protective provisions are included within the DCO application to safeguard the integrity of our apparatus and to remove the requirement for objection. All consultations should be sent to the following email address: box.landandacquisitions@nationalgrid.com	Liaison with utilities providers will be undertaken as part of the DCO process. Details of mitigation measures to protect existing utilities are provided in sections 21.6.1.5 and 21.6.2.4.
National Grid Gas / Scoping Responses 02/09/2022	
Please be aware that written permission is required before any works commence within the NGG easement strip. Furthermore, a Deed of Consent will be required prior to commencement of works within NGG's easement strip subject to approval by NGG's plant protection team.	Liaison with utilities providers will be undertaken as part of the DCO process. Details of mitigation measures to protect existing utilities are provided in sections 21.6.1.5 and 21.6.2.4.
NGG will also need to ensure that its pipelines remain accessible during and after completion of the works.	
We would request that the potential impact of the proposed scheme on NGG's existing assets as set out above and including any proposed diversions is considered in any subsequent reports, including in the Environmental Statement, and as part of any subsequent application. Please engage early with NGG's plant protection team to understand the specific requirements and constraints in relation to working close to high pressure pipelines.	

21.3 Scope

21.3.1 Study Area

5. The Land Use study area has been defined on the basis of anticipated direct and indirect impacts. It is assumed that direct impacts to land use will occur wholly within the Onshore Development Area identified for PEIR. The study area for indirect impacts has been defined on the basis of parish, district and county boundaries. **Figure 21-1** illustrates the Land Use study area.

21.3.2 Realistic Worst Case Scenario

21.3.2.1 General Approach

6. The realistic worst case design parameters for likely significant effects scoped into the EIA for the Land Use assessment are summarised in **Table 21-2**. These are based on the project parameters described in **Chapter 5 Project Description**, which provides further details regarding specific activities and their durations.

7. In addition to the design parameters set out in **Table 21-2**, consideration is also given to the different development scenarios still under consideration and the possible phasing of the construction as set out in sections 21.3.2.2 to 21.3.2.5.

Table 21-2 Realistic Worst Case Design Parameters

	Parameter		
	DBS East or DBS West in isolation	**DBS East and DBS West concurrently**	**DBS East and DBS West sequentially**
Construction			
Landfall	• Horizontal Directional Drill (HDD) horizontal length: 1400m • Number of HDDs: 5 (4x power cables plus 1x spare) • HDD compound works area: 230 x 75m (for four HVAC) • Indicative HDD depth: 20m • Number of transition joint bays: 4 (4x HVAC) • Total construction land take for TJBs: 1,200m^2 • Duration: 18 months	• HDD horizontal length: 1400m • Number of HDDs: 9 (6 x power cables, 1 x fibre optic cable plus 2x spare) • HDD compound area: 310 x 75m (for four HVAC, two HVDC) • Indicative HDD depth: 20m • Number of transition joint bays: 6 (4x HVAC, 2x HVDC) • Total construction land take for TJBs: 1,800m^2 • Duration: 18 months	• HDD horizontal length: 1400m • Number of HDDs: 9 (6 x power cables, 1 x fibre optic cable plus 2x spare) • HDD compound area: 310 x 75m (for four HVAC, two HVDC and one spare) • Indicative HDD depth: 20m • Number of transition joint bays: 6 (4x HVAC, 2x HVDC) • Total construction land take for TJBs: 1,800m^2 • Duration: 42 months

	Parameter		
	DBS East or DBS West in isolation	**DBS East and DBS West concurrently**	**DBS East and DBS West sequentially**
Onshore export cable route	• Working width: 50m (up to 125m at trenchless crossings) • Corridor length: 39km • Number of trenches: up to 5 (4 x HVAC trefoils plus 1 contingency) • Maximum cable burial depth (where restrictions are not present): 2m • Indicative cable burial depth = 1.6m • Jointing bays: every 750m • Jointing bay construction dimensions: 10 x 25m • Indicative HDD depth: 20m	• Working width: 100m (up to 250m at trenchless crossings) • Corridor length: 39km • Number of trenches: up to 7 (4 x HVAC trefoils, 2 x HVDC plus 1 contingency) • Maximum cable burial depth (where restrictions are not present): 2m • Indicative cable burial depth = 1.6m • Jointing bays: every 750m • Jointing bay construction dimensions: 10 x 25m • Indicative HDD depth: 20m	• Working width: 100m (up to 250m at trenchless crossings) • Corridor length: 39km • Number of trenches: up to 7 (4 x HVAC trefoils, 2 x HVDC plus 1 contingency) • Maximum cable burial depth (where restrictions are not present): 2m • Indicative cable burial depth = 1.6m • Jointing bays: every 750m • Jointing bay construction dimensions: 10 x 25m • Indicative HDD depth: 20m

	Parameter		
	DBS East or DBS West in isolation	**DBS East and DBS West concurrently**	**DBS East and DBS West sequentially**
	• HDD compound dimensions: 50 x 50m (70 compounds) • Total onshore cable corridor works area (est.): 4,504,535m^2: • Access routes: Various from public highway to dingle tracks • Haul road: 7m (increasing to 11m at passing places) • Main construction compound: 100 x 100m (2 compounds)	• HDD compound dimensions: 50 x 50m (70 compounds per project) • Total onshore cable corridor works area (est.): 8,228,754m^2 • Access routes: Various from public highway to dingle tracks • Haul road: 7m (increasing to 11m at passing places) • Main construction compound: 100 x 100m (2 compounds per project – 4 in total)	• HDD compound dimensions: 50 x 50m (70 compounds per project) • Total onshore cable corridor works area (est.): 8,228,754m^2 • Access routes: Various from public highway to dingle tracks • Haul road: 7m (increasing to 11m at passing places) • Main construction compound: 100 x 100m (2 compounds per project – 4 in total)

	Parameter		
	DBS East or DBS West in isolation	**DBS East and DBS West concurrently**	**DBS East and DBS West sequentially**
	• Secondary construction compounds: 75 x 75m (15 compounds – for routes to Zone 1) • Duration: 33 months	• Secondary construction compounds: 75 x 75m (30 compounds) • Duration: 33 months	• Secondary construction compounds: 75 x 75m (30 compounds) • Duration: 57 months
Onshore substations	• Total construction area: 180,000m^2 (based on one HVAC (AIS) substation + temporary construction compound) • Duration: 4 years	• Total construction area: 274,416m^2 (based on one HVAC (AIS) substation + temporary construction compound, and one HVDC substation + temporary construction compound) • Duration: 4 years	• Total construction area: 274,416m^2 (based on one HVAC (AIS) substation + temporary construction compound, and one HVDC substation + temporary construction compound) • Duration: 6 years
Operation			
Onshore export cable route	• Permanent easement: 20m	• Permanent easement: 35m	• Permanent easement: 35m

	Parameter		
	DBS East or DBS West in isolation	**DBS East and DBS West concurrently**	**DBS East and DBS West sequentially**
	• Number of trenches: Up to 5 (4x HVAC trefoils plus 1 contingency). Note that drawing shows 1 large trench per project	• Number of trenches: Up to 7 (4x HVAC trefoils, 2x HVDC plus 1 contingency). Note that drawing shows 1 large trench per project.	• Number of trenches: Up to 7 (4x HVAC trefoils, 2x HVDC plus 1 contingency). Note that drawings provided show 1 large trench per project.
Onshore substations	• Permanent substation area: 135,000m^2 (based on one HVAC substation) • Permanent area of land take associated with access roads, drainage solutions and landscaping - yet to be determined • Duration: 30 years	• Permanent substation area: 199,416m^2 (based on one HVAC and one HVDC substation) • Permanent area of land take associated with access roads, drainage solutions and landscaping - yet to be determined • Duration: 30 years	• Permanent substation area: 199,416m^2 (based on one HVAC and one HVDC substation) • Permanent area of land take associated with access roads, drainage solutions and landscaping - yet to be determined • Duration: 30 years

	Parameter		
	DBS East or DBS West in isolation	**DBS East and DBS West concurrently**	**DBS East and DBS West sequentially**
Decommissioning			
No final decision regarding the final decommissioning policy for the onshore project infrastructure including landfall, onshore cable route and onshore substation has yet been made. It is also recognised that legislation and industry best practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused or recycled wherever possible and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the worst case scenario, the impacts will be no greater than those identified for the construction phase.			

21.3.2.2 Development Scenarios

8. There are currently two possible electrical solutions being considered for DBS West, HVAC or HVDC. Due to the distance of the array area offshore DBS East will be an HVDC project. Therefore, there are two possible electrical solutions for the Projects:

   - One HVDC project and one HVAC project; or
   - Two HVDC projects.

9. There are different parameters required for the onshore substations depending on which electrical solution is selected. Therefore, there are four possible development scenarios within the onshore substation zones that could be taken forward:

   - Two HVDC substations in Substation Zone 4;
   - One HVDC substation in Substation Zone 1 and one HVAC substation in Substation Zone 4;
   - One HVDC substation in Substation Zone 4 and one HVAC substation in Substation Zone 1; or
   - One HVDC substation in Substation Zone 1 and one HVDC substation in Substation Zone 4.

10. In order to ensure that a robust assessment has been undertaken, all development scenarios and options have been considered to ensure the realistic worst-case scenario for each topic has been assessed. Further details are provided in **Chapter 5 Project Description**.

21.3.2.3 Construction Scenarios

11. The following principles set out the framework for how the Projects may be constructed (relating to both onshore and offshore works):

    - DBS East and DBS West may be constructed at the same time, or at different times;
    - If built concurrently, both Projects could be constructed in five years;
    - If built non-concurrently, either Project could be built first;
    - If built non-concurrently, each Project would require a five year period of construction;
    - If built non-concurrently, it is anticipated that there would be up to a two year lag between the start of construction for the first project and the start of construction for the second project; and

- Assuming a maximum construction period per Project of five years, and taking the above into account, the maximum construction period over which the construction of both Projects could take place is seven years.

12. In order to determine which construction scenario presents the realistic worst case for each receptor and impact, the assessment considers both maximum duration effects and maximum peak effects, in addition to each Project being developed in isolation, drawing out any differences between each of the two Projects.

13. The three construction scenarios considered by the Land Use assessment are therefore:

- Build DBS East or build DBS West in isolation;
- Build DBS East and DBS West concurrently – reflecting the maximum peak effects; and
- Build the Projects sequentially with a lag of up to two years – reflecting the maximum duration of effects.

14. The individual, concurrent and sequential construction scenarios all allow for flexibility to build out the Projects using a phased approach. This will allow the Projects to adapt to National Grid Electricity Transmission Operator's development plans for the onshore grid connection points. Under a phases approach the maximum timescales for individual elements of the construction have been assessed.

15. Any differences between the Projects, or differences that could result from the manner in which the first and the second Projects are built (concurrent or sequential and the length of any gap) are identified and discussed where relevant in section 21.6. For each potential impact, only the worst case construction scenario for two Projects is presented, i.e. either concurrent or sequential. The justification for what constitutes the worst case is provided, where necessary, in section 21.6.

21.3.2.4 Operation Scenarios

16. Operation scenarios are described in detail in **Chapter 5 Project Description**. The assessment considers the following scenarios:

- Only DBS East in operation;
- Only DBS West in operation; and
- The two Projects operating concurrently, with or without a lag of up to two years between each Project commencing operation.

17. If the Projects are built out using a phased approach, there would also be a phased approach to starting the operational stage. The worst case scenario for the operational phase for the Projects has been assessed. See section 5.1.1 of **Chapter 5 Project Description** for further information.

18. The operations lifetime of each Project is expected to be 30 years.

21.3.2.5 Decommissioning Scenarios

19. Decommissioning scenarios are described in **Chapter 5 Project Description**. Decommissioning arrangements will be agreed through the submission of a Decommissioning Programme prior to construction, however for the purpose of this assessment it is assumed that decommissioning of the Projects could be conducted separately, or at the same time.

21.3.3 Mitigation Embedded in the Design

20. This section outlines the embedded mitigation relevant to the Land Use assessment, which has been incorporated into the design of the Projects (**Table 21-3**). Where other mitigation measures are proposed, these are detailed in the impact assessment (section 21.4).

Table 21-3 Embedded Mitigation Measures

Parameter	Mitigation Measures Embedded into the Project Design
Site selection	The Projects have undergone an extensive site selection process which has involved incorporating environmental considerations in collaboration with the engineering design requirements (for more information see **Chapter 4 Site Selection and Assessment of Alternatives**). Land take has been minimised where possible, reducing sterile land parcels and aligning with field boundaries.
Haul road	The Applicant has included a haul road to deliver equipment to the installation site from construction compounds. This will limit physical disturbance to a specific area.
Construction corridor	As well as a working easement, the construction corridor will have sufficient space allowed to ensure appropriate soil management and pre-construction drainage.

21.4 Assessment Methodology

21.4.1 Policy, Legislation and Guidance

21.4.1.1 National Policy Statements

21. The assessment of potential impacts upon Land Use has been made with specific reference to the relevant National Policy Statements (NPS). The specific assessment requirements for Land Use, as detailed in the NPS, are summarised in **Table 21-4** together with an indication of the section of this chapter where each is addressed.

22. It is noted that the NPS for Energy (EN-1) and the NPS for Electricity Networks Infrastructure (EN-5) are in the process of being revised. Draft versions were published for consultation by the Department for Business, Energy and Industrial Strategy (BEIS) (2021a and 2021b, respectively). A review of these draft versions has been undertaken in the context of this PEIR chapter.

23. Following the consultation in 2021 on the draft energy NPS, a new consultation opened on the 30th March 2023 on revised drafts of the energy NPSs, including EN1, EN3 and EN5. Due to the timing of this consultation, and finalisation of this PEIR we have been unable to review and take these revised draft NPS into account within these documents. However, these will be reviewed and incorporated into the final ES where relevant.

Table 21-4 NPS Assessment Requirements

NPS Requirement	NPS Reference	PEIR Section Reference
EN-1 NPS for Energy		
The ES (see Section 4.2) should identify existing and proposed land uses near the project, any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. Applicants should also assess any effects of precluding a new development or use proposed in the development plan.	Paragraph 5.10.5	Existing land use within the Onshore Development Area are discussed in section 21.5.
Applicants will need to consult the local community on their proposals to build on open space, sports or recreational buildings and land. Taking account of the consultations, applicants should consider providing new or additional open space including green infrastructure, sport or recreation facilities, to substitute for any losses as a result of their proposal. Applicants should use any up-to-date local authority assessment or, if there is none, provide an independent assessment to show whether the existing open space, sports and recreational buildings and land is surplus to requirements.	Paragraph 5.10.6	Pre-application discussions have been undertaken with the local authority (East Riding of Yorkshire Council) through the Evidence Plan process and with the local community through the Introductory Consultation and ongoing land owner discussions. This process of consultation will include the discussion of the works associated with the Projects and will allow East Riding of Yorkshire Council and members of the public to comment on the project design.

NPS Requirement	NPS Reference	PEIR Section Reference
During any pre-application discussions with the applicant the LPA should identify any concerns it has about the impacts of the application on land use, having regard to the development plan and relevant applications and including, where relevant, whether it agrees with any independent assessment that the land is surplus to requirements.	Paragraph 5.10.7	Further details are provided in section 21.2. Chapter 7 Consultation summarises the consultation approach undertaken.
Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5) except where this would be inconsistent with other sustainability considerations. Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination.	Paragraph 5.10.8	Impacts on the BMV agricultural land and soil quality are assessed in paragraph 106. Minimisation of impacts to BMV agricultural land will be undertaken where possible. However, the predominant land cover within the Onshore Development Area is classed as BMV agricultural land, and therefore the ability to avoid use of BMV agricultural land will be extremely limited. More widely, impacts due to any existing contaminated land are discussed in **Chapter 19 Geology and Land Quality**.

NPS Requirement	NPS Reference	PEIR Section Reference
Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place.	Paragraph 5.10.9	Sterilisation of future mineral resources has been assessed, as discussed in **Chapter 19 Geology and Land Quality**.
The general policies controlling development in the countryside apply with equal force in Green Belts but there is, in addition, a general presumption against inappropriate development within them. Such development should not be approved except in very special circumstances. Applicants should therefore determine whether their proposal, or any part of it, is within an established Green Belt and if it is, whether their proposal may be inappropriate development within the meaning of Green Belt policy.	Paragraph 5.10.10	No designated areas of Green Belt will be affected by the Projects. The closest designated green belt (around the city of York) is located approximately 32km at its nearest point from any part of the Onshore Development Area.
However, infilling or redevelopment of major developed sites in the Green Belt, if identified as such by the local planning authority, may be suitable for energy infrastructure. It may help to secure jobs and prosperity without further prejudicing the Green Belt or offer the opportunity for environmental improvement. Applicants	Paragraph 5.10.11	

NPS Requirement	NPS Reference	PEIR Section Reference
should refer to relevant criteria 133 on such developments in Green Belts.		
An applicant may be able to demonstrate that a particular type of energy infrastructure, such as an underground pipeline, which, in Green Belt policy terms, may be considered as an "engineering operation" rather than a building is not in the circumstances of the application inappropriate development. It may also be possible for an applicant to show that the physical characteristics of a proposed overhead line development or wind farm are such that it has no adverse effects which conflict with the fundamental purposes of Green Belt designation.	Paragraph 5.10.12	
The IPC should ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. It should give little weight to the loss of poorer quality agricultural land (in grades 3b, 4 and 5), except in areas (such as uplands) where particular agricultural practices may themselves contribute to the quality and character of the environment or the local economy.	Paragraph 5.10.15	Impacts on the BMV agricultural land and soil quality are assessed in paragraph 106. Potential mitigation measures to reduce the significance of effect as also discussed within paragraph 106. Minimisation of impacts to BMV agricultural land will be undertaken where possible. However, the predominant land cover within the Onshore Development Area is classed as BMV agricultural land, and therefore the ability to avoid use of BMV

NPS Requirement	NPS Reference	PEIR Section Reference
		agricultural land will be extremely limited. More widely, impacts due to any existing contaminated land are discussed in **Chapter 19 Geology and Land Quality**.
Although in the case of much energy infrastructure there may be little that can be done to mitigate the direct effects of an energy project on the existing use of the proposed site (assuming that some at least of that use can still be retained post project construction) applicants should nevertheless seek to minimise these effects and the effects on existing or planned uses near the site by the application of good design principles, including the layout of the project.	Paragraph 5.10.19	Impacts on existing land use will be minimised through reinstating working areas to pre-existing conditions in line with the latest guidance. The majority of land traversed by the onshore export cable corridor is agricultural and following construction the expectation is that farming practices will continue above the buried cable. The Projects' configuration, routing and layout will take into account the multiple environmental criteria including land use (see **Chapter 4 Site Selection and Assessment of Alternatives**).
Draft EN-1 NPS for Energy		
Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5) except where this would be	Paragraph 5.11.8	Impacts on the BMV agricultural land and soil quality are assessed in paragraph 106. Potential mitigation measures to reduce the significance of effect as also discussed within paragraph 106.

NPS Requirement	NPS Reference	PEIR Section Reference
inconsistent with other sustainability considerations. Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination, and where contamination is present, applicants should consider opportunities for remediation where possible. Applicants are encouraged to develop and implement a Soil Management Plan which could help minimise potential land contamination.		Minimisation of impacts to BMV agricultural land will be undertaken where possible. However, the predominant land cover within the Onshore Development Area is classed as BMV agricultural land, and therefore the ability to avoid use of BMV agricultural land will be extremely limited. More widely, impacts due to any existing contaminated land are discussed in **Chapter 19 Geology and Land Quality**.
The general policies controlling development in the countryside apply with equal force in Green Belts but there is, in addition, a general presumption against inappropriate development within them. Such development should not be approved except in very special circumstances. Applicants should therefore determine whether their proposal, or any part of it, is within an established Green Belt and if it is, whether their proposal may be inappropriate development within the meaning of Green Belt policy (see paragraph 5.11.16 below).	Paragraph 5.11.10	No designated areas of Green Belt will be affected by the Projects. The closest designated green belt (around the city of York) is located approximately 32km at its nearest point from any part of the Onshore Development Area.

NPS Requirement	NPS Reference	PEIR Section Reference
Public Rights of way, National Trails and other rights of access to land are important recreational facilities for example for walkers, cyclists and horse riders. The Secretary of State should expect applicants to take appropriate mitigation measures to address adverse effects on coastal access, National Trails, other rights of way and open access land and, where appropriate, to consider what opportunities there may be to improve or create new access. In considering revisions to an existing right of way, consideration should be given to the use, character, attractiveness and convenience of the right of way. The Secretary of State should consider whether the mitigation measures put forward by an applicant are acceptable and whether requirements or other provisions in respect of these measures should be included in any grant of development consent.	Paragraph 5.11.23	The potential impacts from the Projects on Public Rights of Way and other access rights are discussed within sections 21.6.1.5 and 21.6.2.5.
EN-5 NPS for Electricity Networks Infrastructure		
There is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs has any agriculturally significant consequences.	Paragraph 2.13.8	No impacts associated with electric and magnetic fields (EMF) on land use and agriculture are anticipated and so are not discussed within this

NPS Requirement	NPS Reference	PEIR Section Reference
		chapter. For impacts associated with health, please refer to **Chapter 27 Human Health**.
EN-5 NPS for Electricity Networks Infrastructure		
There is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs has any agriculturally significant consequences.	Paragraph 2.13.8	No impacts associated with electric and magnetic fields (EMF) on land use and agriculture are anticipated and so are not discussed within this chapter. For impacts associated with health, please refer to **Chapter 27 Human Health**.
Draft EN-5 NPS for Electricity Networks Infrastructure		
…the developer's commitment, as set out in their ES, to mitigate the potential detrimental effects of undergrounding works on any relevant agricultural land and soils, particularly regarding Best and Most Versatile land. Such a commitment must guarantee appropriate handling of soil, backfilling, and return of the land to the baseline Agricultural Land Classification (ALC), this ensuring no loss or degradation of agricultural land. Such a commitment should be based on soil and ALC surveys in line with the 1988 ALC criteria and due consideration of the Defra Construction Code.	Paragraph 2.11.14	Impacts on the BMV agricultural land and soil quality are assessed in paragraph 106. Potential mitigation measures to reduce the significance of effect as also discussed within paragraph 106. Minimisation of impacts to BMV agricultural land will be undertaken where possible. However, the predominant land cover within the Onshore Development Area is classed as BMV agricultural land, and therefore the ability to avoid use of BMV agricultural land will be extremely limited.

21.4.1.2 Other

24. In addition to the NPS, there a number of pieces of legislation, policy and guidance applicable to the assessment of Land Use. These include:

- Legislation – the following UK legislations are considered the most relevant to this chapter:
  - Countryside and Rights of Way Act (CRoW) 2000;
  - The Environmental Stewardship (England) Regulations 2005;
  - The Commons Act 2006;
  - Planning Act 2008;
  - Marine and Coastal Access Act 2009;
  - Natural Environment White Paper 2011;
  - A Green Future: Our 25 Year Plan to Improve the Environment 2018;
  - National Planning Policy Framework (NPPF) 2021; and
  - Environment Act 2021.
- Local Policy – EN-1 states that the Planning Inspectorate will also consider Development Plan Documents or other documents in the Local Plan Framework to be relevant to its decision making. The Local Plan relevant to this chapter is:
  - East Riding Yorkshire Local Plan Strategy Document 2016
- Guidance – The relevant existing documents, which contain best practice guidance on soil handling, construction management and recreational features are listed below:
  - Ministry of Agriculture, Fisheries and Food (MAFF) (1988) Agricultural Land Classification of England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land (Revised Guidelines);
  - MAFF (2000) Good Practice Guide for Handling Soils;
  - Department for Communities and Local Government (2002) Planning Policy Guidance 17: Planning for open space, sport and recreation;
  - Department for Environment, Food and Rural Affairs (Defra) (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites;
  - Environment Agency (2010) Managing Invasive Non-native Plants;

- Natural England (2012) Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land;
- Highways Agency (2019) Design Manual for Roads and Bridges (DMRB) LA 109 (Geology and Soils) and LA 112 (Population and human health);
- Highways Agency (2020) Design Manual for Roads and Bridges (DMRB) LA 112, Revision 1 (Population and human health);
- Institution of Environmental Sciences (IES) (2020) Sustainable, healthy, and resilient: Practice-based approaches to land and soil management;
- British Society of Soil Science (2021) Guidance Document 3 Working with Soil Guidance Note: Benefitting from soil management in development and construction;
- Society for the Environment (SocEnv) (2021) Soils and Stones Report;
- The Institute of Quarrying (IQ) (2021) Good Practice Guide for Handling Soils in Mineral Workings; and
- Institute of Environmental Management and Assessment (IEMA) (2022) A New Perspective on Land and Soil in Environmental Impact Assessment.

25. Further detail is provided in **Chapter 3 Policy and Legislative Context**.

21.4.2 Data and Information Sources

21.4.2.1 Site Specific Surveys

26. In order to provide site specific and up to date information on which to base the impact assessment, a site characterisation survey was conducted with a Phase 1 habitat survey (see **Chapter 18 Terrestrial Ecology and Ornithology**).

21.4.2.2 Other Available Sources

27. Other sources that have been used to inform the assessment are listed in
28. **Table** 21-5.

Table 21-5 Other Available Data and Information Sources

Data Set	Spatial Coverage	Year
Road maps, railway lines and urban areas (Ordnance Survey)	Landfall, onshore cable route, onshore substation	2020
Datasets on the structure of the agricultural industry (Defra)	England	2021
Soil types (National Soil Resources Institute, Cranfield University)	Landfall, onshore cable route, onshore substation	2021
Environmental Stewardship Schemes (Natural England)	England and Wales	2022
Agricultural Land Classifications (Natural England)*	England and Wales	2020
Common land (Natural England)	England and Wales	2021
Public Rights of Way (East Riding of Yorkshire Council)	East Riding of Yorkshire	2023
Utilities	Landfall, onshore cable route, onshore substation	2022

*Observations made during site specific surveys did not always align with those recorded on the Agricultural Land Classification data set in relation to non-agricultural land. However, this is the best publicly available data source and any changes in classification since the publication of the data set will not be significant in terms of the EIA assessment.

21.4.3 Impact Assessment Methodology

29. **Chapter 6 EIA Methodology** provides a summary of the general impact assessment methodology applied. The following sections describe the methods used to assess the likely significant effects on Land Use.

21.4.3.1 Definitions

30. For each potential impact, the assessment identifies receptors sensitive to that impact and implements a systematic approach to understanding the impact pathways and the level of impacts (i.e. magnitude) on given receptors. The definitions of sensitivity and magnitude for the purpose of the Land Use assessment are provided in **Table 21-6** and **Table 21-8.**

21.4.3.1.1 Sensitivity.

31. **Table 21-6** outlines the criteria to which the sensitivity of each receptor is assessed. This is based on the capacity of receptors to tolerate change and is used to determine if the degree of change would be acceptable in terms of the current legislation and guidance.

Table 21-6 Definition of Sensitivity for a Land Use Receptor

Sensitivity	Definition		
	Land Use	**Agriculture**	**Recreation**
High	Receptor has no or very limited capacity to accommodate changes such as loss of recreational activity / area, loss of land area, soil degradation etc.		
	Planning policy areas designated at national and international scale; Higher level environmental stewardship farms; Future large-scale planning use applications; or Regionally distinctive and rare land uses that cannot be replaced or adapted.	Land at Agricultural Land Classification (ALC) Grade 1 or 2; Land at ALC Grade 3 with respect to permanent land take; Land with Notifiable Weeds or Notifiable Scheduled Diseases that are at risk of spreading; Soil which is susceptible to structural damage and erosion; or Unrecoverable or unadaptable soil.	Recreational feature of national value; National trails or paths; European protected sites; or Nationally important landscapes e.g. Area of Outstanding Natural Beauty (AONB).

Sensitivity	Definition		
	Land Use	**Agriculture**	**Recreation**
Medium	Receptor has limited capacity to accommodate changes such as loss of recreational activity / area, loss of land area, soil degradation etc.		
	Locally designated planning policy areas; Entry level environmental stewardship farms; or Land used for specific and regionally important agriculture or horticulture.	Land at ALC Grade 3 with respect to temporary land take; or Soil which is vulnerable to seasonal structural damage or erosion.	Recreational feature of regional value; Public Rights of Way e.g. footpaths, bridleways and byways; or Stewardship bridleways (a public footpath that has been granted bridleway status under a stewardship scheme, courtesy of the landowners.
Low	Receptor has moderate capacity to accommodate changes such as loss of recreational activity / area, loss of land area, soil degradation etc.		
	No impact on designated planning policy areas; Not under environmental stewardship scheme, but is subject to other environmental management schemes; Large agricultural holdings; or Land used for ordinary agriculture or horticulture.	Land at ALC Grade 4; Arable or pasture grassland; or Medium to coarse soil with some resistance to structural damage.	Recreational asset of local value; Local permissive pathways; or Open access land.
Negligible	Receptor generally tolerant of changes such as loss of recreational activity / area, loss of land area, soil degradation etc.		

Sensitivity	Definition		
	Land Use	**Agriculture**	**Recreation**
	No environmental stewardship schemes or other environmental management schemes.	Land at ALC Grade 5 or Urban; Land which is not agricultural, arable or pasture grassland; or Soil with a greater resistance to structural damage.	Recreational feature with limited or no recreational value.

32. The ALC grades and descriptions following the Ministry of Agriculture, Fisheries and Food (MAFF) (1988) Agricultural Land Classification of England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land (Revised Guidelines) are shown in **Table 21-7.**

33. The ALC ranks land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. It provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system, and in turn, underpinning the principles of sustainable development. The ALC system classifies land into the five grades outlined above. Grade 3 land can be subdivided into 3a (good) and 3b (moderate).

34. BMV land is the land which is most flexible, productive and efficient which can best deliver future crops for food and non-food uses such as biomass, fibres and pharmaceuticals. It is defined as Grades 1, 2 and 3a by policy guidance. However, national datasets no longer subdivide Grade 3 land. For the purpose of this assessment, and taking into consideration a worst-case scenario, all Grade 3 land subject to permanent land take will be classified as BMV.

Table 21-7 ALC Grades and Descriptions (MAFF, 1988)

Grade	Description
Grade 1: Excellent quality agricultural land	Land with little or no limitations to agricultural use. Land can support a very wide range of agricultural and horticultural crops with consistently high yields. Crops commonly include top fruit, soft fruit, salad crops and winter harvested vegetables.
Grade 2: Very good quality agricultural land	Land with minor limitations which can affect crop yields, cultivations or harvesting. This land can support a wide range of agricultural and horticultural crops. Reduced flexibility can lead to difficulties in the production of more demanding crops such as winter harvested vegetables and arable root crops. Whilst the yield is high, it may be lower or more variable than Grade 1 land.
Grade 3: Good to Moderate quality agricultural land	Land with moderate limitations which can affect the type of crops to be grown, timing and method of cultivation, harvesting or the level of yield. More demanding crops generally have a lower or more variable yield than on Grades 1 and 2 land.
Grade 4: Poor quality agricultural land	Land with significant limitations that considerably restrict the type and yield of crops that can be grown. Grass with occasional arable crops (e.g. cereals and forage crops) are predominantly suited to this land and produce variable yields.
Grade 5: Very poor quality agricultural land	Land with very severe limitations, restricting use to permanent pasture or rough grazing, with the exception of occasional pioneer forage crops.
Urban	Built-up urban areas with 'hard' uses such as housing, industry, commerce, education etc. with little potential to restore land after use.
Non-agricultural	'Soft' use areas such as golf courses, private parklands, public open spaces and sports field that can be returned to agriculture relatively easily.

21.4.3.1.2 Magnitude

35. The magnitude of impact on a receptor is defined based on the spatial extent, duration, frequency and severity of the impact. The potential effects may be adverse, beneficial or neutral.

36. Magnitude of impact is assessed according to the criteria defined in **Table 21-8**.

Table 21-8 Definition of Magnitude of Impacts

Magnitude	**Definition**		
	Land Use	**Agriculture**	**Recreation**
High	Permanent / irreversible changes, over the whole receptor, affecting usability, risk, value over a wide area, or certain to affect regulatory compliance; or Existing land use would not be able to continue on >5ha of land or the entire landowner / occupiers available land (where smaller) where the land would be rendered unviable for agricultural purposes or permanent changes to land management would be required.	Permanent loss of >20ha of Grade 1, 2 or 3 agricultural land or >60% total regional resource (Natural England, 2012); or Full land recovery in excess of 10 years.	Permanent closure of a recreational feature or permanent reduction in amenity value.

Magnitude	Definition		
	Land Use	**Agriculture**	**Recreation**
Medium	Moderate, permanent or long-term reversible changes, over the majority of the receptor, affecting usability, risk, value over the local area, possibly affecting regulatory compliance; Existing land use would not be able to continue on <5ha of land; or Noticeable changes to the existing land use.	Medium to long term loss of between 5 and20ha of Grade 1,2 or 3 agricultural land or >60% of the regional resource; Permanent loss of >10ha of Grade 3 agricultural land; Full land recovery expected within 5 -10 years; or <10ha of any agricultural land permanently lost from agriculture.	Temporary closure or disruption to a recreational feature or temporary reduction in amenity values (works within 100m of the feature).
Low	Temporary change affecting usability, risk or value over the short-term; or Temporary change affecting usability within the site boundary; measurable permanent change with minimal effect on usability, risk or value; no effect on regulatory compliance.	Short term loss of >20ha, or permanent loss of >10ha of Grade 4 land or >10% of regional resource; Full land recovery expected within 5 years; or <20ha of soil is temporarily unsuitable for agriculture or <5ha is permanently lost from agriculture.	Temporary reduction in amenity value of a recreational feature (works 100 – 250m of feature).
Negligible	Minor permanent or temporary change, undiscernible over the medium-to short-term, with no effect on usability, risk or value.	No identifiable material changes to the soil resource; or Small areas <1,000m^2 is permanently lost from agriculture.	No direct impact to feature and no amenity loss (works >250m of feature).

21.4.3.2 Significance of Effect

37. The assessment of significance of an effect is informed by the sensitivity of the receptor and the magnitude of the impact. The determination of significance is guided by the use of an impact significance matrix presented in **Chapter 6 EIA Methodology**. Definitions of each level of significance are provided in **Table 21-10** For the purposes of this assessment, any effect that is of major or moderate significance is considered to be significant in EIA terms, whether this be adverse or beneficial. Any effect that has a significance of minor or negligible is not significant.

Table 21-9 Land Use Significance of Effect Matrix

		Adverse Magnitude				Beneficial Magnitude			
		High	**Medium**	**Low**	**Negligible**	**Negligible**	**Low**	**Medium**	**High**
Sensitivity	High	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Minor	Minor	Minor	Moderate	Major
	Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

Table 21-10 Definition of Effect Significance

Significance	Definition
Major	Very large or large change in receptor condition, which is likely to be important considerations at a regional or district level because they contribute to achieving national, regional or local objectives, or could result in exceedance of statutory objectives and / or breaches of legislation.
Moderate	Intermediate change in receptor condition, which is likely to be important considerations at a local level.
Minor	Small change in receptor condition, which may be raised as local issues but are unlikely to be important in the decision making process.
Negligible	No discernible change in receptor condition.
No change	No impact, therefore, no change in receptor condition.

21.4.4 Cumulative Effect Assessment Methodology

38. The cumulative effect assessment (CEA) considers other plans and projects that may result in cumulation of effects with the Projects. Chapter 6 EIA Methodology provides details of the general framework and approach to the CEA that will be undertaken for the Projects.

39. The final assessment of cumulative effects will be undertaken during the later stages of the EIA, once further information is available on a number of projects such as the Outer Dowsing Offshore Wind Farm, Hornsea Project Four decision and the Sheringham Shoal and Dudgeon Extension Projects examination. However, for the purposes of the PEIR, it is possible to identify a number of projects and plans which are likely to feature in that assessment and consider the extent to which cumulative effects might arise. section 21.7 presents the following preliminary information regarding cumulative effects:

- Screening for cumulative effects; and
- A preliminary short list of plans and projects considered for CEA, including a brief description as to how projects have been screened in and the initial tier level they have been assigned.

21.4.5 Assumptions and Limitations

40. This preliminary assessment is considered to be an interim stage in the EIA process. The results presented in the following sections are based on early design assumptions and initial assessments which will be refined and presented in the final Environmental Statement (ES) to be submitted as part of the DCO application.

41. Potential effects to assets are based on a quantitative assessment where possible in order to predict the effect on land use and agricultural activities, particularly during the construction phase. It is however, accepted that the perceptions, particularly for receptor sensitivity, may differ between individuals. Therefore, the most likely perception is chosen where possible and it is assumed that differences in opinion would balance on average.

42. The baseline environment in terms of agricultural land cover, includes the crops grown and agricultural practices adopted where these are known. It should be noted that this assessment is based on high level datasets which are only accurate at the time of data collection, and therefore should only be considered indicative of the land uses found within the study areas.

43. Impacts on soil resources are not predicted to extend beyond the direct study area (Onshore Development Area). Therefore, any impacts to the wider area are not discussed here. The published soil data used to undertake this assessment only provides a general characteristic of the area and are only indicative of the soil type present. The specific characteristics may differ on the ground and can vary between individual fields.

44. The area covered by the Phase 1 Habitat survey referred to in section 21.4.2.1 was limited due to land access issues, for further details see **Appendix 18.1**. The survey teams covered all areas of land that could be accessed with exception of several isolated areas.

21.5 Existing Environment

45. The information presented in this section has drawn on the findings obtained during the desk-based data collection exercise. To aid the characterisation of the baseline environment, a description of the baseline has been made using the following classifications:

- **Agriculture** identifies the agricultural land cover and where applicable describes the crop being grown. This baseline also includes details of ALC which provides a description of the grades of land found within the Onshore Development Area in the context of its versatility and suitability for growing crops;
- **Soil Types and Distribution** identifies the soil found within the Onshore Development Area, including texture, type and fertility;
- **Stewardship Schemes** identifies and describes any land or agri-environment schemes present within the Onshore Development Area;
- **Land Use** identifies high level land use within the Onshore Development Area;
- **PRoW and Cycle Routes** identifies all such designated routes within the Onshore Development Area; and
- **Utilities** identifies and describes (at a high level) utilities present within the Onshore Development Area.

46. The description of the baseline environment provided within the subsequent sections has been divided into the following three development footprint areas:

- Landfall (including both possible landfall locations);
- Onshore export cable corridor; and
- Onshore substation zones.

21.5.1 Agriculture

47. Agriculture in the Yorkshire and Humber region is primarily arable (including arable crops, permanent grassland and temporary grass). The average farm size of 90ha is slightly greater than the English average of 85ha. Cereal farming dominates, with wheat, barley and oil seed rape as common crops. Alongside cereal farming, root crops, potatoes and field vegetables are also grown. Some livestock farming is also present in the region, principally cattle, pigs and poultry (Defra, 2021).

48. Agricultural land in England and Wales has been defined according to the ALC which measures the quality and versatility of soil in a grading system, and is based on factors including climate, nature of the soil and site-based factors (MAFF, 1988). The grading system is described in **Table 21-7**.

49. The BMV agricultural land are classified as Grades 1, 2 and 3a. These comprise land that is most flexible, productive and efficient in response to inputs and can best deliver future crops for food and non-food uses such as biomass, fibres and pharmaceuticals. ALC Grades 3b, 4 and 5 are considered less productive, although land designated as such may hold value in relation to nature conservation and landscape interests.

50. The ALC underpins the principles of sustainable development, and is used by Defra, and others, for determining the quality of farmland and providing advice to local planning authorities, developers and the public if a development is proposed on agricultural land or other 'greenfield' sites that could grow crops.

51. Using data from Natural England, **Figure 21-2** shows the location of ALC within the Onshore Development Area. No differentiation is made within this data set between ALC Grades 3a and 3b, therefore, further consideration of this information in this chapter has assumed that all ALC Grade 3 is classified as 3a, therefore conforming to the description of BMV agricultural land.

52. The Onshore Development Area is characterised by a series of contrasting ALC grades. The assessment presented in this chapter focuses only on direct effects to ALC land within the Onshore Development Area.

53. The percentage of land of different ALC grades within the Onshore Development Area is presented in **Table 21-11**. With reference to the percentage of ALC graded land at landfall, the remaining 14% is composed of beach which is not included within the ALC grading system.

Table 21-11 ALC Grades within the Onshore Development Area

ALC grade	Landfall		Onshore export cable corridors		Onshore substation zones		Onshore Development Area	
	Ha	%	Ha	%	Ha	%	Ha	%
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	36.84	35.30	625.76	68.40	156.50	100.00	908.18	66.6
3	52.61	50.40	267.12	29.20	N/A	N/A	413.10	30.30
4	N/A	N/A	N/A	N/A	N/A	N/A	0.01	0.00
5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Urban	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Non-agri-cultural	N/A	N/A	21.27	2.30	N/A	N/A	21.51	1.60
Total	89.45		914.15		156.50		1342.79	

Note: The grey shaded rows (ALC Grades 1-3) denote the BMV agricultural land with an assumption that all Grade 3 land is 3a and not 3b. This is highly conservative and protective approach which over-estimates the area of BMV land.

21.5.1.1 Landfall

54. Grade 3 soils comprise 35.30% of the landfall area (not including the beach), with Grade 2 soils accounting for 50.40% of the total landfall area (**Table 21-11**).

55. It should be noted that the landfall compound area will be a maximum of 2.3ha.

21.5.1.2 Onshore Export Cable Corridor

56. The onshore export cable corridor is predominantly comprised of both ALC Grades 2 (68.4%) and 3 land (29.20%), covering a combined area of 892.88ha (see **Table 21-11**).

57. Non-agricultural land, located to the north west of Tickton, comprises 2.30% of the onshore export cable corridor.

21.5.1.3 Onshore Substation Zones

58. The land within the onshore substation zone comprises entirely of ALC Grade 2 land covering an area of 156.50ha. The permanent works area of the onshore substation zones represent a maximum area of 19.9ha. It should be noted that almost all of the land within the land use study area is ALC Grade 2 (see **Figure 21-2**) making avoidance of such BMV land impossible considering the footprint requirement.

21.5.2 Soil Types and Distribution

59. This section provides a description of the soils found within the Onshore Development Area, including the type, drainage, texture, fertility and moisture. The National Soils Map (National Soil Resources Institute, undated) classification has been used to determine the types of soil that exist within the Onshore Development Area.

60. It should be noted that the published soil data provide generic characteristics and is indicative of the soil type present. The precise soil type and characteristics will differ between and within individual fields and will be captured within a Soil Management Plan (SMP).

61. Refence should be made to **Chapter 20 Flood Risk and Hydrology** for further details on soils in relation to flood risk and water. Any impact on the soil resource is not predicted to extend beyond the Onshore Development Area.

62. **Table 21-12** provides additional detail on the characteristics of the soil types found within the Onshore Development Area (Cranfield University, 2020).

Table 21-12 Soil Types within the Onshore Development Area

Soilscapes definition	Texture	Drainage	Natural fertility	Typical habitats	Landcover	General cropping	General area within Onshore Development Area
Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils	Loamy and clayey	Impeded drainage	Moderate	Seasonally wet pastures and woodlands	Grassland and arable some woodland	Mostly suited to grass production for dairying or beef; some cereal production often for feed. Timeliness of stocking and fieldwork is important, and wet ground conditions should be avoided at the beginning and end of the growing season to avoid damage to soil structure. Land is tile drained and periodic moling or subsoiling will assist drainage	Landfall, onshore export cable corridor, onshore substation zones

Soilscapes definition	Texture	Drainage	Natural fertility	Typical habitats	Landcover	General cropping	General area within Onshore Development Area
Slightly acid loamy and clayey soils with impeded drainage	Loamy some clayey	Slightly impeded drainage	Moderate to high	Wide range of pasture and woodland types	Arable and grassland	Reasonably flexible but more suited to autumn sown crops and grassland; soil conditions may limit safe groundwork and grazing, particularly in spring.	Landfall, onshore export cable corridor, onshore substation zones
Loamy and clayey floodplain soils with naturally high groundwater	Loamy and clayey	Naturally wet	Moderate	Wet flood meadows with wet carr woodlands in old river meanders	Grassland some arable	Productive grassland provided drainage is maintained. Risk of poaching and soil damage early and late in the grazing season. Cereal production where flood risk is low	Onshore export cable corridor

Soilscapes definition	Texture	Drainage	Natural fertility	Typical habitats	Landcover	General cropping	General area within Onshore Development Area
Freely draining lime-rich loamy soils	Loamy	Freely draining	Lime rich	Herb-rich chalk and limestone pastures; lime-rich deciduous woodlands	Arable with grassland at higher altitude	Well suited to spring and autumn-sown cereals and other crops including grass but the land is mostly nitrate vulnerable	Onshore export cable corridor
Loamy and sandy soils with naturally high groundwater and a peaty surface	Peaty	Naturally wet	Low to high	Wet meadows	Mostly arable	Cereals, roots, potatoes and field vegetables provided groundwater is controlled. Ease of working and winter harvesting, which can be damaging to structure, dependent on texture and drainage of subsoil. Irrigation needed on lighter soils	Onshore export cable corridor

Soilscapes definition	Texture	Drainage	Natural fertility	Typical habitats	Landcover	General cropping	General area within Onshore Development Area
Naturally wet very acid sandy and loamy soils	Sandy and loamy	Naturally wet	Very low	Mixed dry and wet lowland heath communities	Arable and horticulture some wet lowland heath	Highly productive, where not stony, and suitable for cereals, roots, potatoes and vegetables but droughty and dependent on irrigation; lime and fertilisers are rapidly leached. Winter harvesting of roots will damage weak soil structure and lead to compaction	Onshore export cable corridor

21.5.2.1 Soil Natural Capital, Ecosystem Services and Carbon Resource

63. The concepts of 'natural capital' and 'ecosystem services' are used to bring together scientific and economic considerations so that the potential impact of ecosystem modification and the way it may affect society can be assessed more fully. Natural capital in the context of soils can be considered in terms of the mass, energy and entropy (organisation) stored within the soil. Soil ecosystem services refer to the functions and processes through which the soils produce resources used by humans. These are summarised in **Table 21-13**.

Table 21-13 Soil Natural Capital and Ecosystem Services

Mass (constituents of soil matrix)	**Description**
Mass (constituents of soil matrix)	• Inorganic content - minerals and nutrients; • Organic content - carbon and organisms; • Water; and • Air.
Energy	• Temperature and biomass.
Entropy (organisation)	• Soil physical and chemical structure; • Organisation of biological populations; • Food webs and biodiversity; and • Spatial and temporal structure.
Soil ecosystem services	**Descriptions**
Support functions	Supporting food and fibre production, ecological habitat and diversity through: • Physical stability and medium for supporting plants; • Supply of plant nutrients; and • Role as habitat and gene pool / seed bank.

Soil ecosystem services	Descriptions
Regulation functions	• Regulation of major elemental cycles – macronutrients (nitrogen, phosphorus and potassium) and micronutrients; • Regulation and buffering of the hydrological cycle and attenuation of pollutants; and • Regulation / cycling of organic matter (waste decomposition and carbon cycle).
Provisioning functions	• Use as a raw material for development; and • providing a platform for development.
Cultural functions	• Repository for, and protection of, archaeological artefacts and structures of heritage value; and • Location of religious / spiritually significant structures / sites (e.g., burial grounds).

64. Soils have a large reserve of organic carbon, which may be lost as a result of land use change and changes as a result of human activity (including climate change), resulting in the release of greenhouse gasses. This may also impact other ecosystem services such as food security, biodiversity and storage of water. Conversely, agricultural management practices and the use of waste materials may allow for more carbon to be stored in soils.

65. It should be noted, however, that currently evidence of a direct linkage between land management activities, changes in soil carbon and greenhouse gas emissions are poor. The highest concentration of carbon storage is in blanket peats. These are not found within the Onshore Development Area.

66. Carbon in live vegetation is estimated to account for five percent or less of the UK land carbon stock, of which forests and woodland (including natural woodland and plantations) account for approximately 80% (Ostle et al., 2009).

21.5.3 Stewardship Schemes

67. Environmental Stewardship Schemes (ESS) allow farmers, tenants and other land managers to receive payment for their environmental land management. The scheme is an agri-environmental scheme that aims to:

- Conserve wildlife and biodiversity;
- Maintain and enhance landscape quality and character;
- Protect natural resources;
- Promote public access; and
- Provide flood management (Defra, 2019).

68. The scheme was launched in March 2005 to build on the Environmentally Sensitive Area Scheme, the Countryside Stewardship Scheme and the Organic Farming Scheme. The ESS are administered by Natural England on behalf of Defra.

69. The scheme has been built into the following three levels:

- Entry Level Stewardship (ELS): simple and effective environmental management open to all farmers and land managers;
- Organic Entry Level Stewardship (OELS): as ESS, but open to farmers of land managers whose land is either wholly or partially managed organically; and
- Higher Level Stewardship (HLS): more complex types of management and agreements which aims to provide significant environmental benefits to priority areas and is tailored to local circumstances.

70. Environmental Stewardship directly covers 209.64ha within the Onshore Development Area (see **Figure 21-3**).

71. The Countryside Stewardship Scheme (CSS) has sought to replace the ESS. The overarching aim of the scheme is to look after and improve the environment by conserving and restoring wildlife habitats, managing flood risk, creating and managing woodland, and reducing agricultural water pollution.

72. Similar to the previous ESS, CSS is divided into a number of elements, including:

- Mid-Tier - these are multi-year agreements that focus on widespread environmental issues, such as reducing water pollution or improving the farmed environment for farmland birds and wild pollinators;
- Wildlife Offers - these multi-year agreements with a range of highly targeted and effective options which include creating sources of nectar and pollen, winter food for seed-eating birds and improved habitats. The offers are tailored to specific farming practices;
- Higher Tier - these are multi-year agreements for the most environmentally important sites, including commons and woodlands. These are usually in places that need complex management, such as restoring habitats, and improving woodland; and
- Capital Grants - these are typically for two years with four different options available:
    - Hedgerows and boundaries – capital grant to restore existing farm boundaries;
    - Woodland Management Plans – one-off payment to support the production of UK Forestry Standard compliant 10-year woodland management plan;
    - Woodland Tree Health – one-off payment to restock or improve woodland due to tree health problems; and
    - Woodland Creation Grant – two-year capital grant to plant and protect young trees.

73. Environment Land Management Schemes (ELMS) are planned for a full rollout by the end of 2024 and will eventually replace CSS. Three new schemes have been developed to support and reward environmental land management and the rural economy, whilst also contributing to government targets and commitments to net zero emissions by 2050. These schemes include:

- Sustainable Farming Incentive;
- Local Nature Recovery; and
- Landscape Recovery.

74. The location and area of the agri-environment schemes within the Onshore Development Area are shown on **Figure 21-3** and **Table 21-14**.

Table 21-14 Agri-Environment Schemes within the Onshore Development Area

Stewardship Scheme	Count	Landfall		Onshore export cable corridor		Onshore substation zones		Onshore Development Area	
		Ha	%	Ha	%	Ha	%	Ha	%
Environmental Stewardship									
ELS and HLS Schemes	4	15.15	14.50	82.58	9.03	N/A	N/A	109.09	8.00
HLS	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OELS Schemes	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	4	15.15		82.58		N/A		109.09	
Countryside Stewardship Scheme									
CSS Mid-Tier, Higher Tier and Woodland Management Plan	6	1.60	1.53	98.95	10.80	N/A	N/A	100.55	7.37
Total	6	1.60		98.95		N/A		100.55	

21.5.4 Land Use

75. The land use within the Onshore Development Area primarily comprises of agricultural land, some of which are enrolled in agri-environment schemes (**Figure 21-4**). The Onshore Development Area overlaps with nationally important designations and landscapes. This section also considers invasive species and utilities that intersect the Onshore Development Area.

21.5.4.1 Land Use Designations

21.5.4.1.1 European Sites, National Designations and Nationally Important Landscapes

76. The possible landfall locations overlap with the following designated sites:

- Greater Wash Special Protection Area;
- Withow Gap (Skipsea) Site of Special Scientific Interest;
- Holderness Inshore Marine Conservation Zone; and
- Holderness National Character Area.

77. The features of these designated sites along with Ancient Woodland (located within the onshore substation zones) are discussed further in **Chapter 19 Geology and Land Quality** and **Chapter 18 Terrestrial Ecology and Ornithology**.

21.5.4.1.2 Local Wildlife Sites

78. A total of four LWS are present within the Onshore Development Area, all of which are non-statutory designated sites. The LWS located within the Onshore Development Area include:

- Beeford – Dunnington, designated due to good quality established semi-natural verge;
- Catwick – Seaton Road, designated due to good quality hedgerow with six woody species per 30m sample;
- Raventhorpe Embankment, designated due to good quality established semi-natural linear grassland; and
- Bentley Moor Wood, designated due to being an area of ancient semi-natural woodland.

79. Further discussion on LWS is provided in **Chapter 18 Terrestrial Ecology and Ornithology**.

21.5.4.1.3 Site Allocations

80. A review of the East Riding of Yorkshire local plan was undertaken to identify any areas of land that are allocated for, or restrict, future development or change of use. This included a review of the site allocation maps.

81. The review indicated that the Onshore Development Area is located within:

- Local Plan Open Space - Hudson Way Rail Trail Molescroft Beverley To Market Weighton Railway Line Beverley East Riding Of Yorkshire green corridor (see **Figure 21-4**); and
- A Coastal Change Management Area (see **Figure 21-4**).

21.5.4.2 Open Access and Common Land

82. Under the CRoW Act 2000, members of the public are not restricted to paths, but can freely walk on mapped areas of mountain, moor, heath, downland registered common land, known as open access land. Common land, however, is privately owned land which the public may access subject to certain defined restrictions.

83. There are no areas of open access and common land within the footprint of the Onshore Development Area. However, the Onshore Development Area is located immediately adjacent to two areas of Registered Common Land (see **Figure 21-4**)., these are:

- Westwood and Hurn, located to the west of Beverley; and
- Swinemoor, located to the north east of Beverley.

21.5.4.3 Dark Sky Areas

84. The International Dark Sky Association officially recognises 12 Dark Sky Places in the UK. The Onshore Development Area is not located within a Dark Sky Area.

21.5.4.4 Injurious Weeds and Invasive Species

85. Invasive non-native species represent a significant threat to native biodiversity and can lead to severe adverse environmental and economic impacts. Three species of invasive plants were identified during the Phase 1 Habitat Survey, these include:

- Himalayan balsam *Impatiens glandulifera*;
- Japanese Knotweed *Reynoutria japonica*; and
- Snowberry *Symphoricarpos albus*.

21.5.5 Public Rights of Way and Cycle Routes

86. There are 25 PRoW and cycle routes located within the Onshore Development Area. These comprise of 18 footpaths, five bridleways, two cycle routes and an additional marked way not associated with a designated footpath or bridleway. Local walking routes, including the Beverley 20 and East Riding Heritage Way, follow these PRoWs and have therefore been inherently assessed throughout this section.

87. **Table 21-15** identifies all PRoW and cycle routes, their reference and description. The crossing methodology for each of these features is yet to be determined. The locations of these crossing points are presented on **Figure 21-5**.

Table 21-15 PRoW and Cycle Routes

PRoW / Cycle Route Name	Reference	Description
Skipsea Footpath No.6	SKIPF06	Footpath
Skipsea Footpath No.7	SKIPF07	Footpath
Seaton Footpath No.10	SEATF10	Footpath
Sigglesthorne Footpath No.1	SIGGF01	Footpath
Catwick Footpath No.8	CATWF08	Footpath
Riston Footpath No.2	RISTF02	Footpath
Tickton Footpath No.1	TICKF01	Footpath
Leconfield Footpath No.33	LECOF33	Footpath
Leconfield Bridleway No.27	LECOB27	Bridleway
Molescroft Footpath No.5	MOLEF05	Footpath
Molescroft Footpath No.2	MOLEF02	Footpath
Molescroft Footpath No.3	MOLEF03	Footpath
Molescroft Footpath No.6	MOLEF06	Footpath
Walkington Footpath No.6	WALKF06	Footpath

PRoW / Cycle Route Name	Reference	Description
Walkington Footpath No.4	WALKF04	Footpath
Walkington Footpath No.9	WALKF09	Footpath
Rowley Bridleway No.13	ROWLB13	Bridleway
Woodmansey Bridleway No.34	WOODB34	Bridleway
Woodmansey Bridleway No.30	WOODB30	Bridleway
Woodmansey Bridleway No.6	WOODB06	Bridleway
Woodmansey Footpath No.7	WOODF07	Footpath
Skidby Footpath No.16	SKIDF16	Footpath
Rowley Footpath No.12	ROWLF12	Footpath
Yorkshire Wolds	Route Number 1	National Cycle Network
Yorkshire Wolds	Route Number 164	National Cycle Network
Beverley Twenty & East Riding Heritage Way (Long Distance Walkers Route)	N/A	Marked Route

21.5.5.1.1 National Trails

88. There are no National Trails located within the Onshore Development Area.

21.5.6 Utilities

89. The majority of the identified utilities crossing the Onshore Development Area are for domestic services that include telecom, electricity, water, gas, sewage and street lighting. Electricity and gas transmission infrastructure is also present within the Onshore Development Area, with National Gas high pressure gas pipelines bisecting the onshore export cable corridors in the areas west of Dunnington and east of Nunkeeling. The onshore substation zones are also bisected by the high pressure gas pipelines to the north of Bentley. National Grid Electricity Transmission overhead electricity transmission line and towers cross the onshore substation zones in a north west to south east direction (see **Figure 21-6**).

21.5.7 Future Trends

90. In the event that the Projects are not developed, an assessment of future conditions for Land Use has been carried out and is described within this section.

91. The baseline conditions presented within this chapter will be subject to change over the duration of the Projects. In the long term, land use and cover are continually evolving and being modified given their close interlink with natural processes and are further driven through climate forcing and change (Wu et al., 2013). However, over the duration of the Projects, it would be anthropogenic drivers that are more likely to drive macro-scale land use change (i.e. through population growth or changes in distribution, changes in land use management and development practices, and responding to economics – especially those pertaining to agriculture).

92. An increase in population, increasing urbanisation and improvement in living standards, may increase pressure for more productive agriculture and could lead to the loss of grassland areas and a continued increase in the use of agri-chemicals and industrial fertiliser to ensure continued high crop yields. Such changes in land cover and associated agricultural practice may modify and alter natural ecosystem functions and processes, including the underground water table, associated water quality, as well as the area, distribution and quality of dependent wildlife habitats and their biodiversity (Sohl et al., 2012).

93. Between 1991 and 2020, the population of East Riding of Yorkshire Council has steadily increased from 292,007 to an estimated 343,201 and this is projected to increase to 360,033 by2041 (East Riding of Yorkshire Council, 2020). Given the current baseline environment within the land use and agriculture study area, it is likely the demand from population growth will drive expansion of the urban areas and result in the loss of some agricultural land replaced, for example, by small housing developments.

94. Further to this, agricultural patterns are linked to agricultural policy and available subsidy / farm payment structures. Future changes to UK agricultural policy outside the EU are unknown at the time of writing but are likely to influence agricultural practise in the area in future years.

21.6 Assessment of Significance

21.6.1 Potential Effects During Construction

21.6.1.1 Impact 1 Agricultural Drainage

95. There is the potential for the groundworks associated with the onshore export cable installation and onshore substations construction to impact the natural and artificial field drainage systems. These systems, both natural and artificial, play an important role by ensuring soils remain aerated and reduce the risks associated with surface water flooding to the agricultural land itself and surrounding environment.

96. Existing field drains are expected to be made of ceramic or plaster and are typically found at a depth between 0.5 to 1.5m. As such, it is likely that the drains would be impacted by any excavation works through agricultural fields. More information regarding the local drainage system is provided in **Chapter 20 Flood Risk and Hydrology**.

97. During construction of the substation, any existing field drainage will be permanently impacted.

21.6.1.1.1 Magnitude of Impact – DBS East or DBS West in Isolation

98. In relation to both the onshore export cable installation and onshore substations, without mitigation the magnitude of impact on agricultural drainage is considered to be medium adverse for either DBS East or DBS West in isolation. Agricultural drainage within an area >20ha would be temporarily unsuitable for agriculture during the construction phase.

21.6.1.1.2 Magnitude of Impact – DBS East and DBS West Together

99. A scenario where the Projects are developed sequentially would represent the worst-case scenario for the impacts to drainage. Agricultural drainage will potentially be disrupted twice during the two installations of the onshore export cable corridor and onshore substations.

100. In relation to both onshore export cable installation and onshore substations as sequential projects, the magnitude of impact is considered to be medium adverse without mitigation measures in place. Agricultural drainage within an area >20ha would be temporarily unsuitable for agriculture during the sequential construction phases.

21.6.1.1.3 Sensitivity of Receptor

101. Field drainage networks have a limited capacity to accommodate changes such as degradation or poor reinstatement. Therefore, they are considered to have a medium sensitivity overall.

21.6.1.1.4 Significance of Effect – All Scenarios

102. The medium adverse magnitude of impact, on a medium sensitivity receptor represents a **moderate** adverse significance of effect without mitigation.

21.6.1.1.5 Mitigation and Residual Significance of Effect – All Scenarios

103. An Agricultural Liaison Officer (ALO) and/or land drainage consultant will be appointed to develop pre- and post-construction drainage plans.

104. Pre-construction drainage will be installed to manage water coming from existing underground land drainage pipes which will be affected by the installation of the new export cables. Following installation of the export cables, the post-construction drainage program will commence to ensure that soils affected by the onshore export cable corridor are left in a condition that enables a return within the affected fields to full agricultural production. Where necessary, post-construction drains may be installed, typically parallel to the onshore export cable corridor.

105. In addition to the above, minor watercourses / ditches located within the Onshore Development Area will be subject to temporary damming and diversion during the construction phase to mitigate potential impacts. Installation of ducts below the channel bed may be undertaken, where necessary, as part of the diversion process.

106. Introducing pre-construction drainage and reinstating land drainage as soon as reasonably practicable following the completion of the works reduces both the duration soil is unavailable and the amount of soil affected by poor drainage.

107. These measures will reduce the magnitude of impact from medium adverse to low therefore the residual effect is **minor** adverse, which is deemed not significant in EIA terms.

21.6.1.2 Impact 2 Temporary Loss of Agricultural Land

108. The majority of the construction footprint is located within areas currently associated with agricultural production. The footprint of the onshore export cable corridor, including temporary construction compounds and construction accesses would all contribute to the temporary loss of land for agriculture, as well as the temporary compounds associated with HDD.

109. Construction activities also have the potential to isolate land outside of the Onshore Development Area which would effectively take it out of agricultural use. This would result in the loss of growing seasons in the area affected with associated loss of agricultural related income.

110. Construction activities also have the potential to cause compaction of soil and hinder future agricultural productivity through the use of heavy machinery and disturbance.

111. Agricultural land take associated with the onshore substations is considered to be permanent, and as such, is assessed as an operational impact in section 21.6.2.2.

21.6.1.2.1 Magnitude of Impact – DBS East or DBS West in Isolation

112. Based on the worst-case parameters set out in **Table 21-2**, the total construction footprint within agricultural land would be >20ha for either DBS East or DBS West in isolation. Construction works, however, would not be operating continuously at the same location during the whole construction phase with land being reinstated to its original condition. Therefore, the works are deemed temporary and the magnitude of impact is considered to be low (adverse).

21.6.1.2.2 Magnitude of Impact – DBS East and DBS West Together

113. A scenario where DBS East and DBS West are developed sequentially would represent the worst-case scenario for the temporary loss of land for agriculture.

114. In this scenario, the total construction footprint within agricultural land would be >20ha for two separate construction periods. However, as mentioned previously the impacts would be temporary in nature and not impact the whole construction footprint at the same time, therefore the magnitude of impact is also considered to be low (adverse).

21.6.1.2.3 Sensitivity of Receptor

115. The quality of the agricultural land present within the Onshore Development Area primarily consists of ALC Grade 2 (66.60%) and 3 (30.30%) agricultural land, but also contains non-agricultural land (1.60%). As mentioned previously, all ALC Grade 3 agricultural land is assumed to be Grade 3a and consequently included within the BMV banding. Therefore, the sensitivity of the receptor, in accordance with **Table 21-6**, is considered to be high to reflect the dominance of ALC Grade 2 land.

21.6.1.2.4 Significance of Effect – All Scenarios

116. Without mitigation, the potential impact on temporary loss of agricultural land associated with the construction of DBS East or DBS West in isolation or together is low magnitude on a high sensitivity receptor. Therefore, the potential significance of effect is considered **moderate** adverse without mitigation.

21.6.1.2.5 Mitigation and Residual Significance of Effect – All Scenarios

117. Wherever practicable, access to severed land for farm vehicles will be maintained subject to individual agreements with landowners and occupiers. Where necessary, crossing points will be agreed pre-construction.

118. Under a worst case scenario, the onshore export cable corridor would be fenced for the entire duration of the onshore works. This would equate to land being unavailable for agricultural use for 33 months for both DBS East or DBS West in Isolation and concurrently. DBS East and DBS West sequentially will result in the land being unavailable for 57 months.

119. In order to reduce conflicts, appropriate planning and timings of works will be discussed with landowners and occupiers.

120. Private agreements (or compensation in line with the compulsory purchase completion code) will be sought with relevant landowners / occupiers and the land will be reinstated to its pre-construction condition.

121. By consulting with landowners and occupiers, maintaining access to severed land, appropriate timings of works and reinstatement of land to pre-construction conditions as soon as reasonably practicable, it is likely that the amount of land temporarily unsuitable for agriculture will be reduced.

122. However, the amount of land temporarily affected would be >20ha in all construction scenarios and therefore the magnitude of impact would remain low (adverse). As a result, the residual significance of effect would remain **moderate** adverse. This is deemed to be significant.

21.6.1.3 Impact 3 Soil Degradation and Loss of Soil to Erosion

123. There is the potential for soils to become compacted and for soil structure to deteriorate during construction works. Degradation is most likely to occur at temporary compound locations and along access routes where heavy materials and equipment are stored. Similarly, changed to the soil structure can affect local drainage (this is described in **Chapter 20 Flood Risk and Hydrology**).

124. Deterioration of the soil structure can lead to reduced biological activity, water infiltration, soil porosity and permeability. Deterioration can also lead to an increased soils strength and risk of erosion (European Commission, 2008). These impacts can lead to reduced fertility and crop yields.

125. Soil quality can also be adversely affected by spills and leaks of contaminative materials. It can also be adversely affected by the drying and decomposition of peaty layers during stockpiling.

126. There is also the potential for soil erosion to occur during construction works, with some types of soils more susceptible to erosion than others. Additional factors that influence erosion include the soil texture, landscape, weather and land use.

127. Excavation, storage and reinstatement exposes the soils and creates an opportunity for erosion to occur. Loss of soil via erosion, may lead to a reduction in the quality of soils and therefore impact on the value of the agricultural land within the Onshore Development Area.

128. The following activities proposed during the onshore construction works have the potential to degrade and erode the existing soil resource:

- Intrusive pre-construction surveys;
- Removal of trees / vegetation;
- Topsoil stripping and earthworks within the construction footprint;
- Use of the haul roads and mobilisation areas; and
- Stockpiling and reinstatement of soil.

21.6.1.3.1 Magnitude of Impact – DBS East or DBS West in Isolation

129. Soil within construction areas will be subject to earthworks including initial stockpiling and movement between stockpiles. It is considered that >20ha of soil will potentially be affected temporarily. Therefore, the magnitude of impact is considered to be medium adverse.

21.6.1.3.2 Magnitude of Impact – DBS East and DBS West Together

130. A scenario where DBS East and DBS West are developed sequentially represents the worst-case scenario for the potential degradation and erosion of soils.

131. In this scenario, the total construction footprint within agricultural land would be >20ha for two separate periods of construction. The amount of time construction traffic, heavy machinery and heave materials will spend on site is therefore increased. The works will also require topsoil to be stripped and stored for two periods of construction until cable installation has been completed.

132. Soil within the construction areas would be subject to earthworks including initial stockpiling and movement between stockpiles. The total space required for soil storage is also greatest for the sequential scenario.

133. For this scenario, >20ha of soil will potentially be affected temporarily. Therefore, the magnitude of impact is considered to be medium adverse.

21.6.1.3.3 Sensitivity of Receptor

134. The soils within the Onshore Development Area are mostly loamy and clayey. Clayey soils have few sand grains and a lot of very small particles. Loamy soils have a mix of sand, silt and clay-sized particles and are therefore susceptible to compaction.

135. The cohesive nature of clayey and loamy soils results in a low vulnerability in relation to erosion. They are also difficult to handle during wet periods using machinery, without causing structural degradation. Given these characteristics, the soil resource within the Onshore Development Area is assigned a conservative value of medium sensitivity with respect to the potential for degradation and erosion during the construction period.

21.6.1.3.4 Significance of Effect – All Scenarios

136. Without mitigation, the greatest impact arising from all construction scenarios is medium adverse magnitude, on a medium sensitivity receptor, representing a **moderate** adverse significance of effect without mitigation.

21.6.1.3.5 Mitigation and Residual Significance of Effect – All Scenarios

137. Measures set out in the MAFF (2000) Good Practice Guide for Handling Soils and Defra's (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites will be adopted. Additionally, guidance from IES (2020) Sustainable, Healthy and Resilient: Practice-Based Approaches to Land and Soil Management will also be used. A Soil Management Plan (SMP) outlining the mitigation measures and best practice techniques, which contractors will be obliged to comply with will also be produced. Mitigation measures included within the SMP will include:

- Consideration of weather conditions where it is appropriate to work for each soil type, e.g. not working in an area of poorly draining soils following a period of heavy rain;
- Storing soils appropriately;
- Ensuring effective drainage systems are used during construction; and
- Employing reinstatement and plant vegetation following completion of construction works.

138. The SMP will set out procedures for the appropriate handling of soils during the works, including:

- Using a competent contractor for soil handling, storage and reinstatement under Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites;
- Storing topsoil adjacent to where it is stripped, wherever practicable;
- Storing excavated subsoil separately from the topsoil, with sufficient separation to ensure segregation;
- Restricting movements of heavy plant and vehicles to specified routes; and
- Minimising the footprint of excavation works as much as reasonably possible.

139. These measures will reduce the magnitude of impact from medium adverse to low therefore the residual effect is **minor** adverse, which is deemed to be not significant.

21.6.1.4 Impact 4 Impact to Environmental Stewardship Schemes (ESS)

140. During the construction period there would be the potential for impacts to ESS within the Onshore Development Area. The effect on individual landowners / occupiers with agreements in place would depend on the extent and duration of construction works within the land parcels managed, in addition to the terms and conditions attached to the agreement in place.

141. Two potential connected impacts on ESS are anticipated as a result of construction:

- Ecological – loss of agreements and the substantive agri-environmental objectives of the scheme (i.e., loss of field margins); and
- Financial – loss of the agreement and the impact in overall farming income.

142. The Onshore Development Area interacts with four different ESS classified at Entry Level plus Higher Level Stewardship, which represents 8% of the Onshore Development Area. The Onshore Development Area also crosses three CSS classified as Middle Tier, one Higher Tier and one Woodland Management Plan area.

143. In some instances, it may not be possible to avoid land managed under an agri-environment scheme, resulting in a landowner / occupier being potentially unable to meet the terms of the agreement. The level of impact could range from no impact, a minor or temporary change such as the need to make changes to grazing or cropping requirements or the termination of the agreement.

144. For the purposes of DCO submission, the impact on specific agreements will only be known once the final Onshore Development Area at the time of DCO submission has been established, and landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.

145. The significance of effect on landowners / occupiers with agri-environment agreements in place will depend on the extent and duration of construction works within land parcels managed, and the terms and conditions attached to the agreement in place.

146. Refinement of the Onshore Development Area (most notably the onshore export cable corridor) will take into consideration land parcels managed under agri-environment agreements, with a view to avoid these land parcels where possible. Landowner engagement will form a key part of the DCO boundary refinement, during which information relating to the location, extent and content of the agreements will be gathered and fed back into the refinement process. This includes gathering information from landowners on any ecological constraints or opportunities associated with existing agreements.

147. Ecological losses associated with the impacts to agri-environmental schemes are discussed within **Chapter 18 Terrestrial Ecology and Ornithology**.

21.6.1.5 Impact 5 Disruption to Existing Utilities

148. The majority of the identified utilities crossing the Onshore Development Area are for domestic services that include telecom, electricity, water, gas, sewage and street lighting. The Onshore Development Area will also cross buried high pressure gas pipelines on four occasions.

149. The onshore export cable corridor crosses the Dogger Bank A and B offshore wind farm underground cable route to the west of Routh and again at the eastern onshore substation zones boundary. The indicative cable route for the Hornsea Project Four offshore wind farm does not cross the onshore export cable corridors but is adjacent to it in the area around Beverley before crossing into the onshore substation zones to the south west of the A1079.

150. The Projects will undertake utility crossings in accordance with industry standard practice as agreed with the utilities owners. Therefore, **no impacts** associated with existing utilities are anticipated under any of the construction scenarios.

21.6.1.6 Impact 6 Disruption to users of Recreational Routes

151. The Onshore Development Area crosses numerous recreational routes such as PRoWs (including bridleways and footpaths), a marked way and National Cycle Network routes, as shown on **Figure 21-5**. The Onshore Development Area interacts with a total of 26 recreational routes as outlined in **Table 21-15**, the crossing methodology for each of these features is yet to be determined.

152. Potential interactions with recreational routes are limited to works along the onshore export cable corridor and onshore substation zones. The landfall works would not require closure of any recreational routes, although some activities may require brief periods of restricted access.

21.6.1.6.1 Magnitude of Impact – DBS East or DBS West in Isolation

153. The onshore cable duct would be installed in sections approximately 750m in length, shorter sections may be required at HDD crossings, with an estimated typical construction presence of four weeks along each c. 750m section (please see **Chapter 5 Project Description**). Where the onshore export cable corridor crosses any of the recreational routes there would be a construction presence and open excavations. In the absence of mitigation, this would prevent public access and in effect would represent a temporary closure until the works along that stretch of the onshore export cable corridor are complete. Whilst there would be no permanent closures, any temporary closure to a recreational route is assessed as impact of medium adverse magnitude.

21.6.1.6.2 Magnitude of Impact – DBS East and DBS West Together

154. DBS East and DBS West built sequentially represents the worst-case scenario due to the requirement for two temporary closures on each affected route, i.e. one closure for each project. Although the number of temporary closures would double under this scenario, the overall impact is still temporary and so represents an impact of medium adverse magnitude.

21.6.1.6.3 Sensitivity of Receptor

155. PRoWs are considered to be regionally important receptors and are as assessed as medium sensitivity, whereas National Cycle Network routes are considered to be nationally important receptors and are assessed as high sensitivity.

21.6.1.6.4 Significance of Effect –All Scenarios

156. In relation to PRoW, for both DBS East or DBS West in isolation together, the magnitude of impact is medium adverse on a medium sensitivity receptor, representing a **moderate** adverse significance of effect without mitigation.

157. In relation to National Cycle Network routes, for both DBS East or DBS West in isolation together, the magnitude of impact is medium on a high sensitivity receptor, representing a **major** adverse significance of effect without mitigation.

21.6.1.6.5 Mitigation and Residual Significance of Effect – All Scenarios

158. Disruption to any recreational routes will be managed to ensure continued safe access for members of the public, and all efforts will be made to minimise any closure durations. The exact management method will be agreed in advance with East Riding of Yorkshire Council for that stage of works. Mitigation measures available include:

- Appropriately fenced (unmanned) crossing points;
- Manned crossing points; and
- Temporary alternative routes.

159. There would be no permanent closures of any recreational routes.

160. Soft management techniques will be employed where cycle routes intersect the Onshore Development Area. These methods will include, but are not limited to, the use of pilot vehicles to safely escort construction traffic when crossing cycle routes as well as stop and go signs.

161. Safety measures will be implemented where haul roads cross PRoW, including raising awareness of the feature to construction workers and PRoW users of the hazards associated with the haul road. Where a recreational route is used as part of a construction access point, an alternative route for the PRoW will be provided.

162. After the completion of construction works, all recreational routes would be reinstated to their original condition or otherwise as agreed with East Riding of Yorkshire Council.

163. For all temporary alternative routes required, the following measures will be followed:

- A pre- and post-construction survey (including identification of surface condition and street furniture) of the route affected will be undertaken. Surveys will be undertaken by an experienced surveyor with the scope of coverage and methodology agreed with East Riding of Yorkshire Council.
- A qualified ALO will be employed to ensure that information on existing land conditions is obtained, recorded and verified during these surveys.
- Where impacted by the works, the surveyed recreational route will be restored to its original condition or otherwise as agreed with East Riding of Yorkshire Council.
- All alternative routes would be advertised following East Riding of Yorkshire Council standards for advertising temporary closure of the route.

164. These measures will reduce the magnitude of impact from medium adverse to negligible therefore the residual effect is **minor** adverse for both PRoW and National Cycle Network routes, which is deemed to be not significant.

21.6.2 Potential Effects During Operation

21.6.2.1 Impact 1 Disruption to Field Drainage

165. DBS East and DBS West will primarily be located on rural, agricultural land where there are limited existing formal surface water drainage systems. There are, however, a large number of agricultural land drains, ordinary watercourses and Internal Drainage Board (IDB) maintained watercourses.

166. Permanent above ground infrastructure and hard standing at the onshore substations, as well as the presence of buried cables has the potential to affect field / land drainage during operation (see **Chapter 20 Flood Risk and Hydrology** for further detail).

167. Field drainage along the onshore export cable corridor would be reinstated following the construction phase in order to maintain the level of field drainage in place pre-construction. All cable construction compounds, and temporary haul roads would be fully reinstated following construction and would have no operational use.

168. The backfilling of material, both within construction drainage channels and the onshore export cable corridor, would prevent a conduit from forming and ensure that there are no changes to local flow rates due to changes in permeability.

169. Whilst there would be a permanent change to field drainage at the onshore substations during operation, this would be compliant with the Flood Risk Assessment (FRA) as presented in **Appendix 20.3**. This would ensure that any water discharged from the onshore substation into the surrounding drainage network would be at the existing greenfield runoff rate.

170. Given that all drainage will be reinstated and drainage requirements at the onshore substations will be compliant with any flood risk assessment, it is considered that there will be **no impact** upon field drainage for either scenario during the operational phase.

21.6.2.2 Impact 2 Permanent Loss of Land for Agriculture

171. The onshore export cables would be buried to an indicative depth of 1.6m and following reinstatement, normal agricultural activities would be able to continue following completion of the construction works.

172. Joint bays would be required along the route of the onshore export cables to connect sections of cable. Routine maintenance is anticipated as consisting of one annual visit to each jointing bay to carry out routine integrity tests with periodic testing of cables likely required every two to five years. Access would typically be via man-hole covers and possible non-intrusive checking of the cable in between jointing bays with, for instance, ground penetrating radar.

173. Link boxes would also be present above ground for routine maintenance along the cable corridor (link boxes would be required approximately every 750m along the cable route). These will be below ground and accessed via man-hole covers at ground level (with an above ground marker at each location). Link boxes would be located adjacent to field boundaries and roads as far as reasonably practicable.

174. Link boxes are required in proximity (within 10m) to the jointing bay locations to allow the cables to be bonded to earth to maximise cable ratings, as described above. Link boxes would be required approximately every 750m for each circuit (four for HVAC, two for HVDC), with plus an additional 10% to allow for shorter cable lengths at trenchless crossings..

175. The footprint of the onshore substation and associated flood attenuation and landscaping would represent permanent land take for the duration of the operational phase. The footprint of these areas is yet to be defined and will be subject to further design prior to submission of the DCO application.

21.6.2.2.1 Magnitude of Impact – DBS East or DBS West in Isolation

176. DBS East or DBS West in isolation will require the installation of an estimated number of 343 link boxes, located approximately every 750m along the onshore export cable corridor. It is proposed that all link boxes would be located below ground with an above ground marker post at each location. This is not considered to represent a significant loss of agricultural land.

177. The worst-case total permanent land take for the footprint of the onshore substation for either DBS East or DBS West is approximately 13.5ha (exclusive of landscaped areas and drainage requirements). Therefore, the magnitude of impact is considered to be medium adverse.

21.6.2.2.2 Magnitude of Impact - DBS East and DBS West Together

178. The total permanent land take for DBS East and DBS West (concurrently or sequentially) is approximately 20ha (exclusive of landscaped areas and drainage requirements).

179. DBS East and DBS West (concurrently or sequentially) would require the installation of an estimated number of 343 link boxes located approximately every 750m along the onshore export cable corridor. As with DBS East or DBS West in isolation, it is proposed that all link boxes would be located below ground with an above ground marker post at each location. This is not considered to represent a significant loss of agricultural land.

180. The total permanent land take for DBS East and DBS West (concurrently or sequentially) is approximately 19.9ha. Therefore, the magnitude of impact is considered to be medium adverse.

21.6.2.2.3 Sensitivity of Receptor

181. The sensitivity of the receptor is considered to be high to reflect the dominance of ALC Grade 2 land within the Onshore Development Area.

21.6.2.2.4 Significance of Effect – All Scenarios

182. For both DBS East or DBS West in isolation or together, without mitigation, the magnitude of impact is medium adverse on a high sensitivity receptor. Therefore, potential significance of effect is considered **major** adverse without mitigation.

21.6.2.2.5 Mitigation and Residual Significance of Effect

183. Private agreements will be sought between the Applicant and relevant landowners / occupiers regarding any permanent loss of land incurred as a direct consequence of the operation of the Projects.

184. These measures will reduce the magnitude of impact from medium adverse to negligible therefore the residual effect is **minor** adverse, which is deemed to be not significant.

21.6.2.3 Impact 3 Environmental Stewardship Schemes

185. Following construction, all land under an agri-environmental scheme within the onshore export cable corridor will be reinstated to its original condition, with the exception of the link boxes. Given the size of each link box, they are expected to have a negligible impact on the management requirements under an agri-environmental scheme.

186. The onshore substations will not be located within an area under an existing agri-environmental scheme and so there would be **no impact** during the operational phase.

21.6.2.4 Impact 4 Disruption to Existing Utilities

187. The majority of planned and emergency maintenance activities along the onshore export cable corridor would typically be undertaken at joint locations. The cables would be installed in ducts and sections can be removed at joint locations without the need for extensive excavations elsewhere along the corridor. There however remains the potential that some repair activities may be required to the ducts themselves that could require intrusive works between joint locations.

188. Utilities are considered to be highly sensitive, in particular electricity, gas and water mains, due to the potential disruption that could be caused should the services be disrupted. The majority of the identified utilities crossing the Onshore Development Area are for domestic services that include telecom, electricity, water, gas, sewage and street lighting.

189. Any maintenance undertaken would involve contacting potentially affected utility providers and the location of existing services would be identified prior to maintenance works to ensure no impact to these utilities.

190. DBS East and DBS West will undertake utility crossings in accordance with industry standard practice as agreed with the utility owners. The DCO application will also include protective provisions in favour of the utilities providers to provide protection for their assets. Therefore, **no impacts** on existing utilities are anticipated during the operation for either scenario.

21.6.2.5 Impact 5 Disruption to Users of Recreational Routes

191. Routine and ad hoc maintenance activities are not anticipated to require disruption to or closure of any paths or non-motorised routes and will not interfere with local recreation activities such as walking or cycling.

192. Any alternative routes proposed for the construction phase would be removed and the original routes reinstated post-construction. Where recreational routes cross the footprint of permanent infrastructure (e.g., onshore substations, access roads) appropriate safety measures would be introduced to protect users. There would be no permanent closures of any recreational routes Therefore, **no impacts** are predicted during the operation for either scenario.

21.6.2.6 Impact 6 Soil Heating

193. The transmission of electricity results in small energy losses in the form of heat dissipation. However, the design of the onshore cable system would seek to minimise any energy losses. Depending on the thermal resistivity of the soil and the height of the water table, it is likely that a stabilised backfill such as cement bound sand (CBS) would be required to encase the cable ducts. This is commonly used to ensure that the thermal conductivity of the material around the cables is of a known consistent value for the length of the installation. CBS has a low thermal resistance to conduct the heat produced during electricity transmission.

194. The effects of soil heating are only likely to occur directly above the onshore export cables. Based on the study of agricultural land, up to 1,321.28ha is potentially affected should the Projects be taken forward. This calculation assumes the maximum width for effects immediately above the cables (100m, 250m at trenchless crossings) along the full 39km length of the onshore cable corridor. The potential impact of any potential soil heating on agricultural production may negatively affect crop growth.

21.6.2.6.1 Magnitude of Impact – All Scenarios

195. Heat dissipation modelling indicates that the soil temperature at the surface directly above the buried cables would be no higher than ambient temperature during operation. This is based on the maximum current rating requirements, which would only be possible within the final 10km of the onshore export cable corridor. Temperatures would increase as you approach the depth of the buried cables. Under a maximum current rating, soil temperature would typically increase by 1°C for every 50mm of depth.

196. Any impacts on soil heating would be highly localised to the area immediately surrounding the cable system. Where laid in trenches, cables would be buried to a indicative depth of 1.6m, with the principal root growth zone generally accepted to be within the top 50mm of the soil, where any increase in temperature would be less than 1°C.

197. For DBS East or DBS West in isolation or together, the installation of the onshore export cable will result in no change in the temperature at the ground surface, and very small increases in topsoil temperature (less than 1°C in the principal root growth zone). Overall, the magnitude of impact is assessed as negligible.

21.6.2.6.2 Sensitivity of Receptor

198. Given these characteristics, the soil resources within the Onshore Development Area are considered susceptible to soil heating. However, the thermal resistivity of the material immediately surrounding the cables has a much greater bearing on heat dissipation and the backfill used to reinstate the land following the completion of construction will be selected for its properties in this respect. It is therefore considered that the sensitivity of the receptor is medium.

21.6.2.6.3 Significance of Effect – All Scenarios

199. For DBS East or DBS West in isolation or together, without mitigation, the magnitude of impact is negligible on a medium sensitivity receptors. Therefore the significance of effect is considered **minor** adverse without mitigation.

21.6.2.6.4 Mitigation and Residual Significance of Effect – All Scenarios

200. The significance of effect for all scenarios is minor adverse which is not considered to be a 'significant effect' under the EIA regulations. Therefore, no additional mitigation is required.

21.6.3 Potential Effects During Decommissioning

201. No decision has been made regarding the final decommissioning policy for the onshore export cables, as it is recognised that industry best practice, rules and legislation change over time. It is likely that the cables would be pulled through the ducts and removed, with the ducts themselves left in situ.

202. In relation to the onshore substation, the programme for decommissioning is expected to be similar in duration to the construction phase. The detailed activities and methodology would be determined later within the project lifetime. Any such methodology and associated mitigation would be agreed with the relevant authorities and statutory consultees. The detailed activities and methodology are expected to include:

- Dismantling and removal of outside electrical equipment from site located outside of the substation buildings;
- Removal of cabling from site;
- Dismantling and removal of electrical equipment from within the substation buildings;
- Removal of main substations building and minor services equipment;
- Demolition of support buildings and removal of fencing;
- Landscaping and reinstatement of the site (including land drainage); and
- Removal of areas of hard standing.

203. The decommissioning works could be subject to a separate licencing and consenting approach.

204. Whilst details regarding the decommissioning of the substations are currently unknown, considering a worst-case scenario, which would be the removal and reinstatement of the current land use, it is anticipated that the impacts would be similar or less than those during construction.

21.7 Preliminary Assessment of Cumulative Effects

205. As detailed in section 21.4.4, this section presents a preliminary assessment of cumulative effects in relation to land use. The final CEA will be undertaken within the ES chapter.

21.7.1 Initial Screening for Cumulative Effects

206. **Table 21-16** below details the potential cumulative effects that may occur between the Projects and other plans, projects and activities. Only potential impacts assessed in section 21.6 where the potential for cumulative effects has been identified (minor, moderate or major) will be taken forward to the final CEA (i.e. those assessed as 'no impact' are not taken forward as there is no potential for them to contribute to a cumulative impact).

Table 21-16 Potential Cumulative Effects

Impact	Potential for Cumulative Effect	Data Confidence	Rationale
Construction			
Impact 1 Agricultural Drainage	Yes	High	Impacts may occur to individual field drains in any area of overlap or those with an extent which intersects two or more proposed development boundaries (where groundworks are anticipated)
Impact 2 Temporary Loss of Agricultural Land	Yes	High	Impacts may occur where project boundaries overlap spatially or temporally on the same landowner/occupier's land. Such impacts have the potential to affect local productivity.
Impact 3 Soil Degradation and Loss of Soil to Erosion	Yes	High	Impacts may occur where project boundaries overlap spatially or temporally on the same landowner/occupier's land. Such impacts have the potential to affect local productivity.

Impact	Potential for Cumulative Effect	Data Confidence	Rationale
Impact 4 Impact to Environmental Stewardship Schemes (ESS)	Yes	High	Impacts may occur where project boundaries overlap spatially or temporally on land subject to the same ESS. Such impacts have the potential to affect land under CSS (e.g. loss of earnings from ESS or failure to achieve environmental objectives).
Impact 5 Disruption to Existing Utilities	No	High	Potentially affected utility providers would be contacted and the location of existing services would be identified prior to the commencement of construction works to ensure there would be no impact.
Impact 6 Disruption to users of Recreational Routes	Yes	High	Cumulative effects may occur depending on the timing of works relative to other projects.
Operation			
Impact 1 Disruption to Field Drainage	No	High	Considered to have no direct impact, therefore it is not taken forward.
Impact 2 Permanent Loss of Land for Agriculture	Yes	High	Cumulative effects may occur at both a local and/or county scale where impacts to productivity affect the agriculture industry.
Impact 3 Environmental Stewardship Schemes	No	High	Following completion of works, land located within ESS will be reinstated and so no cumulative effects are thought to exist. Therefore it is not taken forward.

Impact	Potential for Cumulative Effect	Data Confidence	Rationale
Impact 4 Disruption to Existing Utilities	No	High	Potentially affected utility providers would be contacted and the location of existing services would be identified prior to works ensure there would be no impact.
Impact 5 Disruption to Users of Recreational Routes	No	High	Considered to have no direct impact, therefore it is not taken forward.
Impact 6 Soil Heating	No	High	Considered to have no direct impact, therefore it is not taken forward.
Decommissioning			
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, cumulative effects during the decommissioning stage are assumed to be the same as those identified during the construction stage.			

21.7.2 Plans/Projects Considered for Cumulative Impacts

207. A high-level list of plans/projects that may result in cumulative effects with the Projects is detailed in **Table 21-17**. For Land Use, a search distance of 10km from the Onshore Development Area has been used to determine the initial list of projects considered for the CEA.

208. Plans / projects have been assigned a tier level between 1 and 7, based on the most recent guidance (see **Chapter 6 EIA Methodology**). For the final CEA at ES, this high-level list will be reviewed and screened to ensure all relevant plans / projects are considered in the final assessment. All listed plans / projects will be re-examined at ES to ensure each assigned tier remains accurate at the time of writing.

209. In addition to other offshore wind farms, the classes of projects that could potentially be considered for cumulative assessment of land use includes:

- Large scale housing projects;
- Large scale commercial and industrial projects; and
- Changes to agricultural land use.

Table 21-17 High-Level List of Plans/Projects Screened For Further Assessment in the Final CEA

Tier	Plan / Project	Distance to Onshore Development Area (km)
2	Dogger Bank A & B Offshore Wind Farm	Crosses onshore export cable corridor
3	A164 and Jock Lodge Junction Improvement Scheme	Crosses onshore export cable corridor
3	Solar Farm – Land south of Creyke Beck Substation, 4875 Park Lane, Cottingham	Within Onshore Development Area
3	Solar Farm – Land east and west of West of Tickton Bridge Plantation, Main Road, Routh	Adjacent to the Onshore Development Area
4	Hornsea Project Four Offshore Wind Farm	Adjacent to onshore export cable corridor
4	Scotland England Green Link 2	3.5
4	Solar Farm – Land north east and west of Carr Plantation, Ferry Road, Wawne	1.5
4	Household Recycling Centre – Land north west of Ings Road Picnic Site, Molescroft	Within Onshore Development Area
6	Solar Farm – Robson & Co, White Hall, Shepard Lane, Woodmansey	Within Onshore Development Area
7	New National Grid Substation (Birkill Wood)	Within Onshore Development Area
7	North Humber to High Marnham	Within Onshore Development Area
7	Creyke Beck Substation Extension	400m from Onshore Development Area

21.8 Potential Monitoring Requirements

210. Monitoring requirements will be described in the In-Principal Monitoring Plan (IPMP) submitted alongside the DCO application and further developed and agreed with stakeholders prior to construction based on the IPMP and taking account of the final detailed design of the Projects.

21.9 Interactions

211. The effects identified and assessed in this chapter have the potential to interact with each other. The areas of potential interaction between effects are presented in **Table 21-18**. This provides a screening tool for which effects have the potential to interact **Table 21-19** provides an assessment for each receptor (or receptor group) as related to these impacts.

212. Within **Table 21-19** the effects are assessed relative to each development phase to see if multiple effects could increase the significance of the effect upon a receptor. Following this a lifetime assessment is undertaken which considers the potential for effect to affect receptors across all development phases.

Table 21-18 Interactions Between Impacts - Screening

Potential Interactions between Impacts						
Construction						
	Impact 1 Agricultural Drainage	Impact 2 Temporary Loss of Agricultural Land	Impact 3 Soil Degradation and Loss of Soil to Erosion	Impact 4 Impact to Environmental Stewardship Schemes (ESS)	Impact 5 Disruption to Existing Utilities	Impact 6 Disruption to users of Recreational Routes
Impact 1 Agricultural Drainage		Yes	Yes	Yes	No	No
Impact 2 Temporary Loss of Agricultural Land	Yes		Yes	Yes	Yes	No
Impact 3 Soil Degradation and Loss of Soil to Erosion	Yes	Yes		Yes	Yes	No
Impact 4 Impact to Environmental Stewardship Schemes (ESS)	Yes	Yes	Yes		Yes	No
Impact 5 Disruption to Existing Utilities	No	Yes	Yes	Yes		No
Impact 6 Disruption to users of Recreational Routes	No	No	No	No	No	
Operation						
	Impact 1 Disruption to Field Drainage	Impact 2 Permanent Loss of Land for Agriculture	Impact 3 Environmental Stewardship Schemes	Impact 4 Disruption to Existing Utilities	Impact 5 Disruption to Users of Recreational Routes	Impact 6 Soil Heating
Impact 1 Disruption to Field Drainage		Yes	Yes	No	No	No
Impact 2 Permanent Loss of Land for Agriculture	Yes		Yes	Yes	No	No
Impact 3 Environmental Stewardship Schemes	Yes	Yes		No	No	No

Potential Interactions between Impacts						
Impact 4 Disruption to Existing Utilities	No	Yes	No		No	No
Impact 5 Disruption to Users of Recreational Routes	No	No	No	No		No
Impact 6 Soil Heating	No	No	No	No	No	

Table 21-19 Interaction Between Impacts - Phase and Lifetime Assessment

Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
Field drainage network	Minor adverse	No impact	Minor adverse	**No greater than individually assessed impact** The impacts to the field drainage networks within the Onshore Development Area are considered to have no or minor significance of effect on receptors. Given that the significance levels are no to minor and that each impact would be managed with standard and best practice methodologies it is considered that there would either be no interactions or that these would not result in greater impact than assessed individually.	**No greater than individually assessed impact** Most impacts within the Onshore Development Area will occur during the construction phase of DBS East and DBS West (all scenarios). Field drainage would be reinstated following construction, where possible, with drainage requirements at the onshore substations complying with a flood risk assessment. The impacts to field drainage during the life of the onshore substations are negligible. It is therefore anticipated that there are no lifetime impacts for receptors.
Agricultural land	Major adverse	Minor adverse	Major adverse	**No greater than individually assessed impact** The impacts to agricultural land within the Onshore Development Area are considered to have minor or moderate adverse significance of effect on receptors. Given that the potential impact will be mitigated through agreements with landowners / occupiers and land reinstated to its previous condition, where possible, it is considered that these would not result in greater impact than assessed individually.	**No greater than individually assessed impact** Most impacts within the Onshore Development Area will occur during the construction phase of DBS East and DBS West (all scenarios). Land would be reinstated to its original condition following construction where possible. The impacts to agricultural land during the life of the onshore substations are negligible. It is therefore anticipated that there are no lifetime impacts for receptors.
Agricultural soils	Minor adverse	No impact	Minor adverse	**No greater than individually assessed impact** Impacts to soils (degradation and erosion) are considered to have no to minor adverse magnitude of impact on the individual receptors, with significance of effect dependent upon the sensitivity of the receptor. Given that the significance levels are no to minor and that each	**No greater than individually assessed impact** Most impacts within the Onshore Development Area will occur during the construction phase of DBS East and DBS West (all scenarios). Soil would be reinstated following construction, where possible, restoring the area to its original condition. The impacts to soil during the life of the onshore substations are negligible. It is

Receptor	Highest Significance Level				
	Construction	Operation	Decommissioning	Phase Assessment	Lifetime Assessment
				impact would be managed with standard and best practice methodologies it is considered that there would either be no interactions or that these would not result in greater impact than assessed individually.	therefore anticipated that there are no lifetime impacts for receptors.
ESS and CSS	No impact to major adverse	No impact	No impact to major adverse	The significance of effect on agri-environment schemes will only be known once the final Onshore Development Area at the time of DCO submission has been established, and landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels. Therefore, it is not possible to establish if there will be interactions between each of the phases or lifetime of the Projects.	
Utilities	No impacts	No impacts	No impacts	Not applicable	Not applicable
Users of recreational routes	Minor adverse	No impacts	Minor adverse	**No greater than individually assessed impact** The impacts on recreational routes are considered to have no to minor significance of effects on the individual receptors. Given that each impact would be managed with standard best practice and best practice methodologies, it is considered that there would either be no interactions or that these would not result in a greater impact than assessed individually.	**No greater than individually assessed impact** There would be limited impact to recreational routes during the construction phase of DBS East and DBS West (all scenarios). It is unlikely that there would be widespread closures of routes during the operational phases of DBS East and DBS West (all scenarios). It is therefore anticipated that there are no lifetime impacts for receptors.

21.10 Inter-relationships

213. For Land Use potential inter-relationships between other topics assessed within this PEIR including Land Use. A summary of the potential inter-relationships between flood risk and hydrology, terrestrial ecology and ornithology, geology and land quality, socio-economics and tourism is provided in **Table 21-20**.

Table 21-20 Land Use Inter-relationships

Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
Construction			
Impact 1: Agricultural Drainage	**Chapter 20 Flood Risk and Hydrology**	Section 21.6.1.1	Potential impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies.
Impact 2: Temporary Loss of Land for Agriculture	**Chapter 18 Terrestrial Ecology and Ornithology**	Paragraph 107	Changes in land uses could impact on ecological receptors, for example the removal of trees or hedgerows or the loss of agricultural land.
Impact 3: Soil Degradation and Loss of Soil to Erosion	**Chapter 18 Terrestrial Ecology and Ornithology**	Section 21.6.1.3	Changes in soil quality and quantity could impact on ecological receptors.
	Chapter 19 Geology and Land Quality		Changes in soil quality could impact on ground conditions and potentially contaminated land.
Impact 4: Impacts to Agri-environment Schemes	**Chapter 18 Terrestrial Ecology and Ornithology**	Section 21.6.1.4	Changes to land uses could impact on ecological receptors for example the removal of trees or hedgerows or the loss of agricultural land.
Impact 6 Disruption to	**Chapter 28 Socio-Economics**	Section 21.6.1.6	The Projects may affect local businesses in the

Topic and Description	Related Chapter	Where Addressed in this Chapter	Rationale
users of Recreational Routes	**Chapter 29 Tourism and Recreation**		tourism and recreation industry.
Operation			
Impact 1 Disruption to Field Drainage	**Chapter 20 Flood Risk and Hydrology**	Section 21.6.2.1	Potential impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies.
Impact 2 Permanent Loss of Land for Agriculture	**Chapter 18 Terrestrial Ecology and Ornithology**	Section 21.6.2.2	Changes in land uses could impact on ecological receptors, for example the removal of trees or hedgerows or the loss of agricultural land.
Impact 3 Environmental stewardship schemes	**Chapter 18 Terrestrial Ecology and Ornithology**	Section 21.6.2.3	Changes in land uses could impact on ecological receptors, for example the removal of trees or hedgerows or the loss of agricultural land.
Impact 5 Disruption to Users of Recreational Routes	**Chapter 28 Socio-economics** **Chapter 29 Tourism and Recreation**	Section 21.6.2.5	The Project may affect local businesses in the tourism and recreation industry.

21.11 Summary

214. This chapter has provided a characterisation of the existing environment for Land Use based on both existing and site specific survey data, which has established that there will be some minor to major adverse residual effects on land use receptors.

215. A summary of the potential impacts identified in relation to Land Use is presented in **Table 21-21**.

216. These impacts are driven mainly by change of land use, soil handling and the disruption to PRoW, paths and cycle routes during construction. The construction impacts to land use and soil have a greater likelihood to be more significant on higher sensitivity land (such as ALC Grade 2 land) and land subject to agri-environmental schemes. The construction stage of the Projects has the potential to disrupt paths and national cycle routes which are determined to have high sensitivity to change. However, many of the impacts are temporary and reversible once construction is complete.

217. During operation, the impacts to Land Use are limited. This is because the onshore export cables will be buried. However, residual impacts to changes in land use and agri-environmental schemes during operation are than no more minor adverse. Private agreements will be sought with the relevant landowners / occupiers regarding any permanent loss of land incurred.

218. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, impacts during the decommissioning stage are assumed to be the same as those identified during the construction stage.

Table 21-21 Summary of Potential Likely Significant Effects on Land Use

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Construction						
Impact 1 Agricultural Drainage	Field drainage network	Medium	Medium	Moderate adverse	Maintaining / reinstating land drainage systems; provision of an ALO and/or local specialised drainage contractor; implementation of the final Code of Construction Practice and SMP.	Minor adverse
Impact 2 Temporary Loss of Agricultural Land	Agricultural land	High	Low	Moderate adverse	Landowner consultation; maintain access for farm vehicles; plan timing of works; implement private agreements. Although mitigation	Moderate adverse

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
					measures will be implemented to reduce the magnitude of impact, the area of land impacted will remain >20ha.	
Impact 3 Soil Degradation and Loss of Soil to Erosion	Agricultural soils	Medium	Medium	Moderate adverse	Topsoil stripping; appropriate storage and handling of soils according to their characteristics and in appropriate weather conditions; restrict movements of heavy plant vehicles; Minimising the excavation footprint; SMP; Construction method statements for soil	Minor adverse

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
					handling; Private agreements.	
Impact 4 Impact to Environmental Stewardship Schemes (ESS)	ESS	The level of impact could range from the termination of an agreement to no impact, or a minor and temporary change. The impact on specific agreements will only be known once the final DCO boundary has been established, and landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.				
Impact 5 Disruption to Existing Utilities	Utilities	No impact				
Impact 6 Disruption to users of Recreational Routes	Users of recreational routes	High	Medium	Moderate adverse	Appropriately fenced (unmanned) crossing points; Manned crossing points; and Temporary alternative routes.	Minor adverse
Operation						

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Impact 1 Disruption to Field Drainage	Field drainage network	Medium	No impact			
Impact 2 Permanent Loss of Land for Agriculture	Agricultural land	High	Medium	Major adverse	Private agreements will be sought with the relevant landowners / occupiers regarding any permanent loss of land incurred.	Minor adverse
Impact 3 Environmental stewardship schemes	ESS	Construction of the onshore substations may result in a landowner / occupier being unable to meet the terms of an agreement. The level of impact could range from the termination of an agreement to no impact. The impact on specific agreements will only be known once the final DCO boundary has been established, and landowner agreements are in place, confirming the extent and duration of impacts to the onshore substation land parcels.				
Impact 4 Disruption to Existing Utilities	Utilities	No impact				

Potential Impact	Receptor	Sensitivity	Magnitude of Impact	Pre-mitigation Effect	Mitigation Measures Proposed	Residual Effect
Impact 5 Disruption to Users of Recreational Routes	Users of recreational routes	No impact				
Impact 6 Soil Heating	Agricultural soils	Medium	Negligible	Minor adverse	No additional mitigation is required.	Minor adverse
Decommissioning						
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A Decommissioning Plan would be provided. As such, impacts during the decommissioning stage are assumed to be the same as those identified during the construction stage.						

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