



NORTH FALLS

Offshore Wind Farm

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

Chapter 22 Land Use and Agriculture

Document Reference No: 004447032-05

Date: May 2023

Revision: 05



NORTH FALLS

Offshore Wind Farm

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

May 2023

Project	North Falls Offshore Wind Farm
Sub-Project or Package	Environmental Impact Assessment
Document Title	Preliminary Environmental Information Report Chapter 22 Land Use and Agriculture
Document Reference	004447032-05
Revision	05 (Draft A)
Supplier Reference No	PB9244-RHD-PE-ON-RP-ON-0064

This document and any information therein are confidential property of North Falls Offshore Wind Farm Limited and without infringement neither the whole nor any extract may be disclosed, loaned, copied or used for manufacturing, provision of services or other purposes whatsoever without prior written consent of North Falls Offshore Wind Farm Limited, and no liability is accepted for loss or damage from any cause whatsoever from the use of the document. North Falls Offshore Wind Farm Limited retains the right to alter the document at any time unless a written statement to the contrary has been appended.

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
01 (Draft A)	18/10/22	1 st draft for NFOW review	AH	ALH / GC	-
02 (Draft B)	18/11/22	2 nd draft for NFOW review	AH	ALH	-
03 (Draft C)	20/12/22	3 rd draft for NFOW review	AH	GC	-
04 (Draft D)	26/01/23	4 th draft for NFOW review	AH	GC	-
05 (Draft A)	15/05/2023	Final	AH	GC	JP/DH/AP

Contents

- 22 Land Use and Agriculture 9
 - 22.1 Introduction..... 9
 - 22.2 Consultation 9
 - 22.3 Scope 15
 - 22.3.1 Study area 15
 - 22.3.2 Realistic worst case scenario 15
 - 22.3.3 Summary of mitigation embedded in the design..... 20
 - 22.4 Assessment methodology 21
 - 22.4.1 Legislation, guidance and policy 21
 - 22.4.2 Data sources 25
 - 22.4.3 Impact assessment methodology 26
 - 22.4.4 Cumulative effects assessment methodology..... 30
 - 22.4.5 Transboundary effects assessment methodology 31
 - 22.4.6 Assumptions and limitations 31
 - 22.5 Existing environment 31
 - 22.5.1 Land Use 32
 - 22.5.2 Agriculture and Soils..... 36
 - 22.5.3 Future trends in baseline conditions 40
 - 22.6 Assessment of significance 42
 - 22.6.1 Potential effects during construction: Agriculture 42
 - 22.6.2 Potential effects during construction: Land use 46
 - 22.6.3 Potential effects during operation: Agriculture 49
 - 22.6.4 Potential effects during operation: Land use..... 51
 - 22.6.5 Potential effects during decommissioning..... 53
 - 22.7 Potential monitoring requirements 54

22.8	Cumulative effects	54
22.8.1	Identification of potential cumulative effects	54
22.8.2	Other plans, projects and activities	55
22.8.3	Assessment of cumulative effects.....	67
22.9	Transboundary effects.....	71
22.10	Interactions.....	71
22.11	Inter-relationships	72
22.12	Summary	78
22.13	References	81

Tables

Table 22.1	Consultation responses	10
Table 22.2	Realistic worst case scenarios.....	17
Table 22.3	Embedded mitigation measures	20
Table 22.4	NPS assessment requirements	22
Table 22.5	Other available data and information sources	25
Table 22.6	Definition of sensitivity for a land use and agriculture receptor	27
Table 22.7	ALC grades and descriptions (MAFF, 1988).....	28
Table 22.8	Definition of magnitude for land use and agriculture.....	29
Table 22.9	Significance of effect matrix.....	30
Table 22.10	Definition of effect significance	30
Table 22.11	Land use and landscape (Place Services, 2017).....	32
Table 22.12	Agri-environment schemes within the onshore project area	35
Table 22.13	ALC grades within the onshore project area.....	37
Table 22.14	Soil types within the onshore project area	38
Table 22.15	Soil natural capital and ecosystem services	39

Table 22.16 Houses at risk from flooding in Essex.....	40
Table 22.17 Examples of carbon sequestration by agriculture and land use.....	41
Table 22.18 Potential cumulative effects	54
Table 22.19 Summary of projects considered for the CEA in relation to land use and agriculture (project screening)	56
Table 22.20 Cumulative effects from other projects on land use and agriculture during construction	68
Table 22.21 Cumulative effects from other projects on land use and agriculture during operation.....	70
Table 22.22 Land use and agriculture interactions	71
Table 22.23 Inter-relationships between impacts - screening.....	73
Table 22.24 Inter-relationship between impacts – phase and lifetime assessment ..	74
Table 22.25 Summary of potential likely significant effects on land use and agriculture.....	79

Figures (Volume II)

Figure 22.1 Land Use and Agriculture Study Area

Figure 22.2 Land Use Cover Mapping

Figure 22.3 Agri-Environment Schemes

Figure 22.4 Agricultural Land Classifications (ALC)

Figure 22.5 Soil Types

Figure 22.6 Utilities

Glossary of Acronyms

ALC	Agricultural Land Classification
BEIS	Department for Business, Energy and Industrial Strategy
BMV	Best and Most Versatile
CBS	Cement bound sand
CEA	Cumulative Effect Assessment
CO ₂ eq	Carbon dioxide equivalent
CoCP	Code of Construction Practice
CRoW	Countryside and Rights of Way
CS	Countryside Stewardship
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ELMS	Environment Land Management schemes
ELS	Entry Level Stewardship
EMF	Electric and Magnetic Fields
EN-1	Overarching NPS for Energy
EN-3	Overarching NPS for Renewable Energy Infrastructure
EN-5	Overarching NPS for Electricity Networks Infrastructure
EPIC	Essex Plant Innovation Centre
ES	Environmental Statement
ESS	Environmental Stewardship Scheme
ETG	Expert Topic Group
FRA	Flood Risk Assessment
HDD	Horizontal Directional Drilling
HLS	Higher Level Stewardship
HVAC	High Voltage Alternative Current
IPCC	Intergovernmental Panel on Climate Change
LWS	Local Wildlife Site
MAFF	Ministry of Agriculture, Fisheries and Food
NFOW	North Falls Offshore Windfarm
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OCoCP	Outline Code of Construction Practice
OELS	Organic Entry Level Stewardship

OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Information Report
PRoW	Public Right of Way
SMP	Soil Management Plan
SSSI	Site of Special Scientific Interest
TCC	Temporary Construction Compound
TJB	Transition Joint Bay

Glossary of Terminology

The Applicant	North Falls Offshore Wind Farm Limited (NFOW).
The Project or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Landfall	The location where the offshore cables come ashore.
Landfall search area	Locations being considered for the landfall, comprising the Essex coast between Clacton-on-Sea and Frinton-on-Sea.
Landfall compound	Compound at landfall within which HDD or other trenchless technique would take place.
Transition joint bay	Underground structures that house the joints between the offshore export cables and the onshore export cables.
Horizontal directional drill (HDD)	Trenchless technique to bring the offshore cables ashore at the landfall. The technique will also be used for installation of the onshore export cables at sensitive areas of the onshore cable route.
Onshore project area	The boundary within which all onshore infrastructure required for the Project will be located (i.e. landfall; onshore cable route, accesses, construction compounds; onshore substation and National Grid substation extension), as considered within the PEIR.
Onshore export cables	The cables which take the electricity from landfall to the onshore substation and on to the National Grid. These comprise High Voltage Alternative Current (HVAC) cables, buried underground.
Onshore cable corridor(s)	Onshore corridor(s) within which the onshore export cables and associated infrastructure will be located. A final onshore cable route for which consent will be sought will be selected from within these corridor(s).
Onshore cable route	Onshore route within which the onshore export cables and associated infrastructure would be located.
Jointing bay	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.
Link boxes	Underground chambers or above ground cabinets next to the onshore export cables housing low voltage electrical earthing links.
Cable construction compound	Area set aside to facilitate construction of the onshore cable route. Will be located adjacent to the onshore cable route, with access to the highway.
Haul road	The track along the onshore cable route used by construction traffic to access different sections of the onshore cable route.
Trenchless crossing compound	Areas within the cable corridor(s) which will house trenchless crossing (e.g. HDD) entry or exit points.
Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the Project so that it can be connected to the National Grid.
Onshore substation zone	Area within which the onshore substation will be located.
Onshore substation construction compound	Area set aside to facilitate construction of the onshore substation. Will be located adjacent to the onshore substation (location not yet defined).
National Grid connection point or East Anglia GREEN proposed substation location	The grid connection location for the Project. National Grid are proposing to construct new electrical infrastructure (a new substation) to allow the project to connect to the grid, and this new infrastructure will be located at the National Grid connection point.
National Grid substation connection works	Infrastructure required to connect the Project to National Grid's connection point.

22 Land Use and Agriculture

22.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) considers the likely significant effects of the North Falls Offshore Windfarm (hereafter 'North Falls' or 'the Project') on land use and agriculture. The chapter provides an overview of the existing environment for the onshore project area, followed by an assessment of likely significant effects for the construction, operation and decommissioning phases of the Project.
2. This chapter has been written by Royal HaskoningDHV, with the assessment undertaken with specific reference to the relevant legislation and guidance, of which the primary sources are the National Policy Statements (NPS). Details of these and the methodology used for the Environmental Impact Assessment (EIA) and Cumulative Effects Assessment (CEA) are presented in Section 22.4.
3. At present, the onshore project area is the subject of ongoing refinement. This chapter therefore presents a preliminary significance of effects assessment using the information available to date and will be updated for the purposes of the Environmental Statement (ES). The ES that will be prepared to accompany the Development Consent Order (DCO) application. Similarly, the CEA will be reviewed and updated where required once the Order limits have been finalised.
4. The assessment should be read in conjunction with following linked chapters (Volume I):
 - Chapter 19 Ground Conditions and Contamination;
 - Chapter 23 Onshore Ecology;
 - Chapter 24 Onshore Ornithology;
 - Chapter 25 Onshore Archaeology and Cultural Heritage;
 - Chapter 26 Noise and Vibration;
 - Chapter 27 Traffic and Transport;
 - Chapter 28 Human Health;
 - Chapter 30 Landscape and Visual Impact Assessment;
 - Chapter 31 Socio-Economics; and
 - Chapter 32 Tourism and Recreation.

22.2 Consultation

5. Consultation with regard to land use and agriculture has been undertaken in line with the general process described in Chapter 6 EIA Methodology (Volume I). The key elements to date have included scoping and the ongoing technical consultation via the seascape, landscape and visual impact, land use, health and socio-economics and tourism Expert Topic Group (ETG). The feedback received has been considered in preparing the PEIR. Table 22.1 provides a summary of how the consultation responses received to date have influenced the approach that has been taken.

6. This chapter will be updated following the consultation on the PEIR in order to produce the final assessment, which will be presented in an ES that will be submitted with the DCO application. Full details of the consultation process will also be presented in the Consultation Report as part of the DCO application.

Table 22.1 Consultation responses

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
Planning Inspectorate	August 2021 / Scoping Opinion	<p>Table 3.3 - Potential impacts – mineral resources</p> <p>Loss, damage or sterilisation of mineral resources is scoped into the ES as part of the assessment of ground conditions and contamination. The Inspectorate considers that the economic impact and associated effects of this matter should also form part of the socio-economic assessment, where significant effects are likely to occur.</p>	<p>Potential impacts on mineral resources are considered further in Chapter 19 Ground Conditions and Contamination (Volume I).</p> <p>Engagement with the Essex Minerals and Waste Planning Authority will be undertaken to aid in identifying potential mitigation measures during the construction and operational phases of North Falls. Potential mitigation measures to reduce the significance of effect are discussed within Chapter 19 (Volume I).</p> <p>Consideration of the effects upon economic resources are detailed within Chapter 31 Socio-economics (Volume I).</p>
Planning Inspectorate	August 2021 / Scoping Opinion	<p>Table 3.11 - Agricultural productivity during operation.</p> <p>On the basis that the Scoping Report states that there may be permanent loss of best and most versatile (BMV) land during operation of the Proposed Development, which may result in a loss of agricultural productivity, the Inspectorate considers that there is potential for likely significant effects in respect of this matter and does not agree to scope it out of the ES.</p>	<p>Impacts on agricultural productivity during operation are considered in Section 22.6.3.</p>
Planning Inspectorate	August 2021 / Scoping Opinion	<p>Table 3.11 - Loss of BMV land during construction and decommissioning.</p> <p>The Scoping Report indicates that there is potential for impacts to</p>	<p>Impacts on best and most versatile (BMV) land during construction and decommissioning are considered in Section 22.6.1 and 22.6.3.</p>

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
		<p>Best and Most Versatile (BMV) agricultural land, with a large extent of the onshore scoping area falling within Grades 1 and 2, but at this stage limited information is presented about the location of construction activity and any need for excavation, handling and storage of soil from BMV land. The Inspectorate therefore does not have sufficient information to conclude that there would be no likely significant effects to BMV land as a result of temporary disturbance during construction and this matter should be scoped into the ES.</p>	
<p>Planning Inspectorate</p>	<p>August 2021 / Scoping Opinion</p>	<p>Table 3.11 - Soil heating during construction and decommissioning.</p> <p>On the basis that impacts arising from soil heating would be associated with the operational phase of the Proposed Development, i.e. relating to buried cable systems, the Inspectorate agrees that this matter can be scoped out of the ES.</p>	<p>Buried cable systems emit some heat, however, the electrical system is designed to minimise heat loss to a level which will not affect crop growth.</p> <p>This impact during operation is considered in Section 22.6.3.3.</p>
<p>Planning Inspectorate</p>	<p>August 2021 / Scoping Opinion</p>	<p>Table 3.11 - Public health and safety during construction and decommissioning (impacts from electric and magnetic fields (EMF)).</p> <p>On the basis that impacts arising from EMF would be associated with the operational phase of the Proposed Development, i.e. the onshore substation, cables and associated infrastructure, the</p>	<p>High voltage cable systems generate electromagnetic fields (EMFs) during operation. The potential operational impacts of EMFs are discussed further and assessed in Chapter 28 Human Health (Volume I).</p>

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
		Inspectorate agrees that this matter can be scoped out of the ES.	
Planning Inspectorate	August 2021 / Scoping Opinion	<p>Section 3.4.2, Table 3.10 - Approach to data collection.</p> <p>The Inspectorate considers that sufficient information should be made available to establish the extent and type of receptors, together with the study area, that will be assessed in the ES with respect to land use. If no surveys are conducted to establish relevant receptors this should be clearly explained and justified in the ES. The Applicant should make effort to agree these matters with relevant consultation bodies.</p>	The approach to data collection is considered in Section 22.4.
Planning Inspectorate	August 2021 / Scoping Opinion	<p>Section 3.4.3.4 - Potential cumulative effects.</p> <p>The Scoping Report states that onshore cumulative effects will be considered as set out in Section 1.8. Potential cumulative effects related to land use include other nearby development projects interacting with the same utilities or existing land uses with temporal overlaps with the project's construction phase. The ES should clearly explain how the onshore cumulative effects of the Proposed Development and other relevant developments have been assessed so that any conclusions over the significance of cumulative effects can be demonstrated. Other relevant projects should be identified in</p>	Cumulative effects are considered in Section 22.8.

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
		consultation with relevant consultation bodies.	
Planning Inspectorate	August 2021 / Scoping Opinion	<p>Approach to the assessment.</p> <p>The ES should describe how likely significant effects have been assessed and determined with respect to the land use aspect, with reference to the over-arching methodology which has been presented in Section 1.8.2 of the Scoping Report or any specific methodology that is used. The ES should be clear on how any conclusions on likely significant effects have been reached for the land use assessment taking into account relevant guidance.</p>	The approach to the assessment is considered in Section 22.4.
Planning Inspectorate	August 2021 / Scoping Opinion	<p>Mitigation.</p> <p>The ES should how explain how any mitigation that may be considered necessary to address likely significant effects has been identified and how this mitigation would be secured.</p>	<p>Embedded mitigation is considered in Section 22.3.3.</p> <p>Additional mitigation is considered in Sections 22.6.1 and 22.6.3.</p>
Planning Inspectorate	August 2021 / Scoping Opinion	<p>Consultation.</p> <p>The ES should explain how consultation with the relevant consultation bodies informed the assessment of land use including the study area, methodology adopted to identify likely significant effects and appropriate mitigation measures as necessary.</p>	Consultation is considered in Section 22.2.
Natural England	August 2021 / Scoping Opinion	<p>Section 1.6.3 Points 70 + 76</p> <p>We welcome consideration of Public Rights of Way</p>	Impacts on Public Rights of Way (PRoWs) are considered in Chapter 32 Tourism and Recreation (Volume I).

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
		(PRoW). We would expect consideration for techniques for crossing the Coast Path and PRoW to be included in the EIA. Further detail on crossing PRoWs including details of suitable techniques to be included in the ES.	
Little Bromley Parish Council	August 2021 / Scoping Opinion	Little Bromley Parish Council supports the need for Offshore Windfarms as part of the UK overall power mix. We request that there is minimal impact on the Parish for the Onshore part of this development. We are concerned that a requirement has been made for up to 70 metre working width for laying underground cables as this will be very disruptive. We would also like to point out that many of the farms in the Parish rely on crop irrigation systems for which extensive underground pipework is present. These irrigation systems will need to be considered alongside any water mains, gas mains and electric mains in the Parish.	Impacts on utilities are assessed in Section 22.6.2.2 and 22.6.4.2. Impacts on agricultural land drainage are also assessed in Section 22.6.1.1.
Defence Infrastructure Organisation	August 2021 / Scoping Opinion	It is appreciated that at this stage aspects of the onshore element of the proposed development have not yet been finalised. The MOD would request to be consulted to allow any impact on MOD assets to be assessed. Maps identifying an indicative cable corridor and landfall are included in the Scoping Report (Drawing nos. PB9244-RHD-ZZ-OF-DR-GS-0008 Rev. 04, PB9244-RHD-ZZ-OF-DR-GS-0011 Rev. 04, and PB9244-RHD-ZZ-	The MoD will be consulted on the PEIR, which indicates a refined onshore project area from that present in the Scoping Report.

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
		LN-DR-GS-0073 Rev.01), MOD request that we are consulted when the cable route and onshore landfall location are finalised.	
Network Rail	August 2021 / Scoping Opinion	<p>Upon review of the information provided at this stage, Network Rail would like to inform you that any pylons to be installed will require Wayleaves from Network Rail. Interactions between the development and level crossings, where possible, must be avoided.</p> <p>I trust the above clearly sets out Network Rail's position on the planning application. Should you require any more information from Network Rail, please do not hesitate to contact me.</p>	Pylons are not currently being proposed within the Project's design envelope. Furthermore, direct interaction with level crossings is not included within the Project's design envelope.

22.3 Scope

22.3.1 Study area

- The study area for land use and agriculture direct effects has been defined on the basis of the onshore project area identified for PEIR. The study area for land use and agriculture is shown on Figure 22.1 (Volume II).

22.3.2 Realistic worst case scenario

- The final design of North Falls will be confirmed through detailed engineering design studies that will be undertaken post-consent. In order to provide a precautionary but robust impact assessment at this stage of the development process, realistic worst case scenarios have been defined in terms of the potential effects that may arise. This approach to EIA, referred to as the Rochdale Envelope, is common practice for developments of this nature, as set out in Planning Inspectorate Advice Note Nine (2018). The Rochdale Envelope for a project outlines the realistic worst case scenario for each individual impact, so that it can be safely assumed that all other scenarios within the design envelope will have less impact. Further details are provided in Chapter 6 EIA Methodology (Volume I).
- The realistic worst case scenarios for the likely significant effects scoped into the EIA for the land use and agriculture assessment are summarised in Table

22.2. These are based on North Falls parameters described in Chapter 5 Project Description (Volume I), which provides further details regarding specific activities and their durations.

Table 22.2 Realistic worst case scenarios

Potential impact	Parameter	Notes
Construction		
Impacts relating to landfall	Landfall horizontal directional drill (HDD) (temporary works) physical parameters: HDD temporary works area (4 circuits) = 100m x 200m Transition joint bay size = 4 x 15m No. of transition joint bays = 4 Maximum HDD depth = 20m Maximum number of HDD = 5	Duration includes compound establishment, HDD, transition bays, and reinstatement.
	Duration: 13 months (of which HDD = 6 months) HDD to include 24 hour / 7 days working where required	
Impacts relating to the onshore cable corridor(s)	Cable corridor(s) construction physical parameters: Working width = 60m open trench, 82m at shallow HDD crossings, 122m at deeper HDD crossings Corridor length = 24km Total temporary works footprint (est.) = 150 x 150m (general cable construction compounds) to 100 x 100m (small cable construction compounds). Cable trench width (max.) = 3.75m No. of trenches = 4 Maximum cable burial depth = 2m Minimum cable burial depth at = 0.9m Haul road carriageway width = 6m Jointing bays = 80 -192 (approximately every 500m) buried below ground Jointing bay construction footprint (per bay) = 13 x 5m Jointing bay depth = 2m Temporary construction compound footprint = 100 x 100m (HDD compounds) No. of compounds (est.) = 7	Overall duration includes establishing / reinstating temporary construction compounds (TCCs) and haul roads, cable installation (trench excavation, duct installation, cable jointing), HDD (includes compound establishment, HDD and reinstatement).

Potential impact	Parameter	Notes
	<p>Trenchless crossings physical parameters: Maximum width of buried cable = 110m Maximum trenchless crossing depth = 20m Trenchless crossing compound dimensions (major HDD compounds) = 80 x 120m Trenchless crossing compound (minor HDD compounds) = 40 x 120m</p> <p>Durations: Overall duration = 18 – 24 months Cable installation = 12 months Major HDD (each location) = 8 months (of which HDD = 4 months) Minor HDD crossings = 2 months Major HDD crossings to include 24 hour / 7 days working where required.</p>	
Impacts relating to the onshore substation	<p>Onshore substation (temporary works) physical parameters: Permanent substation footprint = 267 x 300m Construction compound footprint = 150 x 250m</p> <p>Duration: Construction duration = 30 months (6 months preparation works, 24 months construction)</p>	
Operation		
Impacts relating to the onshore cable corridor(s)	<p>Cable corridor(s) operational physical parameters: No. of link boxes = 80 – 196 Link box footprint (per box) = 1.5m² Cross-sectional area of cement-bound sand = 0.6m²</p>	
Impacts relating to the onshore substation	<p>Onshore substation physical parameters: Permanent substation footprint = 267 x 300m</p>	

Potential impact	Parameter	Notes
Decommissioning		
<p>No final decision has yet been made regarding the final decommissioning policy for the onshore project infrastructure including landfall, onshore cable corridor(s) and onshore substation. 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 where 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 purposes of a worst case scenario, the impacts will be no greater than those identified for the construction phase.</p>		

22.3.3 Summary of mitigation embedded in the design

10. This section outlines the embedded mitigation relevant to the land use and agriculture assessment, which has been incorporated into the design of North Falls (Table 22.3). Where other mitigation measures are proposed, these are detailed in the impact assessment (Section 22.6), where applicable.

Table 22.3 Embedded mitigation measures

Parameter	Mitigation measures embedded into North Falls design
Site selection	<p>The onshore project area and onshore substation zone have been defined following an extensive site selection process, which has sought to take account of environmental, engineering, planning and land requirements to seek to identify the least sensitive project location. The site selection process is described in detail in Chapter 4 Site Selection and Assessment of Alternatives (Volume I). The site selection process has included consideration of the following design principles:</p> <ul style="list-style-type: none"> • Minimising land take where possible; • Reducing severed land parcels; • Aligning with field boundaries; • Avoiding BMV land; • Avoiding land allocated in local plans or within planning applications/extant planning permissions; • Avoiding utilities and their required standoff distances as far as possible.
Agricultural drainage	<p>The Applicant will appoint a land drainage consultant to develop pre-and post-construction drainage plans. Additionally, land drainage systems will be maintained during construction and land drainage would be reinstated following completion of construction works during the reinstatement phase. An outline Code of Construction Practice (CoCP) will be submitted with the DCO application, and this will include outline soil management measures and outline the mitigation measures and best practice techniques, which contractors would be obliged to comply with. The DCO will contain a requirement to submit a final CoCP and SMP (which must be in accordance with the Outline CoCP) prior to commencement of construction.</p>
Temporary loss of agricultural land	<p>Wherever practicable, access to severed land for farm vehicles will be maintained. Where necessary and feasible, crossing points would be agreed with landowners and occupiers by the Agricultural Liaison Officer (ALO) pre-construction.</p> <p>Where practicable and in order to reduce impacts on agricultural productivity, the planning and timings of works will be discussed with landowners and occupiers.</p> <p>The land will be reinstated to pre-construction condition and where this is not possible the Project will seek to reach private agreements (or pay compensation in line with the relevant statutory legislation) with relevant landowners/occupiers. Habitat reinstatement method statements will be implemented for all habitats reinstated following the completion of construction (including semi-improved grassland, hedgerows and arable field margins).</p>
Loss of soil to erosion	<p>Measures set out in the Ministry of Agriculture, Fisheries and Food (MAFF) (2000) Good Practice Guide for Handling Soils and Defra (2009) Construction code of practice for the Sustainable Use of Soils on Construction Sites will be adopted and included in the CoCP and SMP, including:</p> <ul style="list-style-type: none"> • Consider the weather conditions where it is appropriate to work for each soil type; • Store soil appropriately; • Ensure effective drainage systems are used during construction; • Reinstatate drainage systems following construction; • Reinstatate and plant vegetation following completion of the construction works; and • Produce a SMP outlining the mitigation measures and best practise techniques, which contractors would be obliged to comply with.

Parameter	Mitigation measures embedded into North Falls design
Soil degradation	<p>Mitigation measures to further reduce the effect of the construction activities include developing a SMP which will set out procedures for the appropriate handling of soils during the construction works, including:</p> <ul style="list-style-type: none"> • 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, where practicable; • Seeding of topsoil bund with clover mix to fix nutrients and keep the soil live, therefore limiting soil loss and requirement for significant inputs when reinstated; • Storage of the excavated subsoil separately from the topsoil, with sufficient separation to ensure segregation; • Handling of soils according to their characteristics; • Limiting mechanised soil handling in areas where soils are highly vulnerable to compaction during wet weather; • Restricting movements of heavy plant and vehicles to specified routes; and • Minimise excavation footprint as much as reasonably possible.
Agri-environment Schemes	<p>The embedded mitigation relating to Agri-environment schemes will be the avoidance of land parcels that are subject to Environmental Stewardship Schemes or Countryside Stewardship Schemes, wherever possible.</p> <p>However, where impacts to land subject to an agri-environment agreement cannot be avoided, these will be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate.</p> <p>In general, it is considered that any ecological losses associated with impacts to agri-environment schemes will be mitigated through the embedded mitigation set out in Chapter 23 Onshore Ecology (Volume I). This includes mitigation relating to habitat reinstatement, in particular around hedgerows, arable field margins and semi-improved grassland habitats.</p>

22.4 Assessment methodology

22.4.1 Legislation, guidance and policy

22.4.1.1 National Policy Statements

11. The assessment of likely significant effects upon land use and agriculture has been made with specific reference to the relevant National Policy Statements (NPS). These are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIPs). Those relevant to the Project are:
 - Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a);
 - NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b);
 - NPS for Electricity Networks Infrastructure (EN-5) (DECC 2011c);
 - Draft Overarching NPS for Energy (EN-1) (Department for Business, Energy and Industrial Strategy (BEIS) 2021a);
 - Draft NPS for Renewable Energy Infrastructure (EN-3) (BEIS 2021b); and
 - Draft NPS for Electricity Networks Infrastructure (EN-5) (BEIS 2021c).
12. The UK Government announced a review of the existing NPSs within its December 2020 Energy White Paper (HM Government, 2020) and issued a draft version of Overarching NPS for Energy EN-1, NPS for Renewable Energy

Infrastructure EN-3 and NPS for Electricity Networks Infrastructure EN-5 for consultation on 6th September 2021 (BEIS, 2021a; BEIS, 2021b; BEIS, 2021d). At the time of writing this PEIR chapter, final versions of the revised NPSs are not available.

13. The specific assessment requirements for land use and agriculture, as detailed in the NPS, are summarised in Table 22.4 together with an indication of the section of the PEIR chapter where each is addressed.

Table 22.4 NPS assessment requirements

NPS requirement	NPS reference	PEIR reference
Overarching NPS for Energy (EN-1)		
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 and proposed land uses are identified in Section 22.5. An assessment of effects is provided in Section 22.6.
Paragraph 5.10.6 states that Applicants will need to consult the local community on their proposals to build on open space, sports or recreational buildings and land.	Paragraph 5.10.6	There is no land take from open access land, sports or recreational buildings required during the Project's construction or operation (see Section 22.5.1.5) and as such effects on these receptors is not considered further within this chapter.
Paragraph 5.10.8 states that "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)".	Paragraph 5.10.8	An assessment of significance for Agricultural Land Classification (ALC) grades, including BMV agricultural land is provided in Section 22.6.
The general policies controlling development in the countryside apply with equal force in Green Belt 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. 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.	Paragraph 5.10.10 - 11	Provision of Green Belt land has been considered when preparing the baseline in Section 22.5.
Paragraph 5.10.15 requires the Secretary of State to ensure that applicants do not site their schemes	Paragraph 5.10.15	A detailed site selection process has been undertaken for each element of the Project's onshore

NPS requirement	NPS reference	PEIR reference
<p>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).</p>		<p>infrastructure (landfall, onshore export cables, onshore substation zone), which has included consideration of interactions with BMV. Where works are to take place within BMV / BMV is to be lost as part of the Project, this is only considered in situations where no reasonable alternative could be identified when balancing other project engineering and design feasibility, planning and environmental constraints. Description of the Project's site selection process is set out in Chapter 4 Site Selection and Assessment of Alternatives (Volume I), and assessment of the effects upon BMV is set out in Section 22.6.</p>
<p>NPS for Renewable Energy Infrastructure (EN-3)</p>		
<p>EN-3 contains relevant policy in relation to the assessment of transmission infrastructure for renewable energy installations, however there is no information specific to this land use and agriculture chapter.</p>		
<p>NPS for Electricity Networks Infrastructure (EN-5)</p>		
<p>The IPC should, however only refuse consent for overhead line proposals in favour of an underground or sub-sea line if it is satisfied that the benefits from the non-overhead line alternative will clearly outweigh any extra economic, social and environmental impacts and the technical difficulties are surmountable. In this context it should consider:</p> <ul style="list-style-type: none"> - the environmental and archaeological consequences (undergrounding a 400kV line may mean disturbing a swathe of ground up to 40 metres across, which can disturb sensitive habitats, have an impact on soils and geology, and damage heritage assets, in many cases more than an overhead line would). 	<p>Paragraph 2.8.9</p>	<p>The decision to underground the export cables was made during the Project's site selection process which is detailed in Chapter 4 Site Selection and Alternatives (Volume I).</p>
<p>Draft NPS for Energy (EN-1)</p>		
<p>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.</p>	<p>Paragraph 5.11.5</p>	<p>Existing proposed land uses have been identified in Section 22.5.</p>

NPS requirement	NPS reference	PEIR reference
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.	Paragraph 5.11.8	The impact assessment for BMV and soil management are set out in Section 22.6.
Draft NPS for Renewable Energy Infrastructure (EN-3)		
There are no material changes as with the existing NPS EN-3 and therefore there are no new relevant paragraphs in relation to this chapter.		
Draft NPS for Electricity Networks Infrastructure (EN-5)		
...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 BMV 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	Potential effects on soils are provided in Section 22.6.

22.4.1.2 Local Planning Policy

14. EN-1 states that the Planning Inspectorate will also consider Development Plan Documents or other documents in the Local Development Framework to be relevant to its decision making.
15. The onshore project area for North Falls is within the administrative area of Essex County Council. There are no relevant land use and agriculture planning policies from Essex County Council.
16. The onshore project area is also within the administrative area of Tendring District Council. Tendring District Council, along with Braintree and Colchester Councils published their local plans in 2017. Due to strategic cross-boundary policies and allocations, Tendring, Braintree and Colchester's Local Plan share an identical Section 1 which was adopted by Tendring District Council in 2021. Section 2 of the Plan sets out strategic planning policies within the Tendring District and how the Local Planning Authority addresses the National Planning Policy Framework (NPPF) on a local basis and was adopted in 2022.
17. The Tendring District Local Plan incorporates core strategies such as Essex Minerals Local Plan (2014) and Essex and Southend-on-Sea Waste Local Plan (more detail on these policies is given in Chapter 19 Ground Conditions and

Contamination, Volume I). Within this local plan, Policy PP 13 The Rural Economy is relevant to land use and agriculture stating that Tendring Council ‘will continue to support proposals for agricultural-related development (where permission is required) provided adverse impacts on the environment are kept to a minimum’.

22.4.1.3 Other legislation, policy and guidance

18. In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of land use and agriculture. These include:

- Marine and Coastal Access Act 2009;
- The Commons Act 2006;
- The Environmental Stewardship (England) Regulations 2005 (as amended);
- Countryside and Rights of Way Act (CRoW) 2000;
- National Planning Policy Framework (NPPF) 2021;
- Natural Environment White Paper 2011; and
- A Green Future: Our 25 Year Plan to Improve the Environment (2018).

19. Further detail is provided in Chapter 3 Policy and Legislative Context (Volume I).

22.4.2 Data sources

22.4.2.1 Site specific

20. To provide site specific and up to date information on which to base the assessment, an Extended Phase 1 Habitat Survey was undertaken in September and October 2021 and March 2022 by Royal HaskoningDHV.

22.4.2.2 Other available sources

21. Other sources that have been used to inform the assessment are listed in Table 22.5 below.

Table 22.5 Other available data and information sources

Data Set	Source	Spatial Coverage	Year	Notes
Road maps, railway lines and urban areas	Ordnance Survey	Landfall, onshore cable route, onshore substation	2020	
Extended Phase 1 Habitat Survey	Royal HaskoningDHV	All habitats within and up to 50m from the boundary of the onshore project area.	2021 and 2022	
Soil survey of England and Wales	National Soil Resources Institute,	Landfall, onshore cable route, onshore	2020	

Data Set	Source	Spatial Coverage	Year	Notes
	Cranfield University	project substation		
Environmental Stewardship Schemes	Natural England	England and Wales	2022	Locations and details
Countryside Stewardship Schemes	Natural England	England and Wales	2022	Locations and details
Agricultural Land Classifications	Natural England	Essex		Locations and details
Common Land	Natural England	England and Wales	TBC	Locations and details
Utilities	Atkins	Onshore project area		Locations and details

22.4.3 Impact assessment methodology

22. Chapter 6 EIA Methodology (Volume I) explains the general impact assessment methodology applied to North Falls. The following sections describe the methods used to assess the likely significant effects on land use and agriculture.

22.4.3.1 Definitions

23. For each potential impact, the assessment identifies receptors within the onshore project area which are 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 and agriculture assessment are provided in Table 22.6, Table 22.7 and Table 22.8.

24. For the purpose of defining receptor sensitivity and impact magnitude, two key groups of impacts have been identified:

- Agriculture and soils: The potential impacts on the soil as a receptor itself, including the bio-physical elements of soils, the surrounding environment, and the agricultural productivity of the land. The presence of potentially contaminated soils is considered separately in Chapter 19 Onshore Ground Conditions and Contamination (Volume I).
- Land use: The potential impacts of the Project on the continuation of the current land use (agricultural, environmental stewardship, countryside stewardship, public access, planning policy, etc.).

22.4.3.1.1 Sensitivity

25. Table 22.6 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 guidelines.

Table 22.6 Definition of sensitivity for a land use and agriculture receptor

Sensitivity	Definition	
	Land Use	Agriculture
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.	
	<ul style="list-style-type: none"> • Planning policy areas designated at national and international scale; • Higher level Environmental Stewardship Schemes (ESS); Higher tier Countryside Stewardship (CS); • Future large-scale planning use applications; or • Regionally distinctive and rare land uses that cannot be replaced or adapted. 	<ul style="list-style-type: none"> • Land at Agricultural Land Classification (ALC) Grade 1, 2 or 3; • Land with Notifiable Weeds and/or Notifiable Scheduled Diseases that are at risk of spreading; • Soil which is susceptible to structural damage and erosion; or • Unrecoverable or unadaptable soil.
Medium	Receptor has limited capacity to accommodate changes such as loss of recreational activity/area, loss of land area, soil degradation etc.	
	<ul style="list-style-type: none"> • Locally designated planning policy areas; • Entry level environmental stewardship Schemes; Mid-Tier and Wildlife Offers Countryside Stewardship Schemes; or • Land used for specific and regionally important agriculture or horticulture. 	<ul style="list-style-type: none"> • Soil which is vulnerable to seasonal structural damage or erosion.
Low	Receptor has moderate capacity to accommodate changes such as loss of recreational activity/area, loss of land area, soil degradation etc.	
	<ul style="list-style-type: none"> • No impact on designated planning policy areas; • Not under environmental stewardship scheme, but is subject to other environmental management schemes (such as Countryside Stewardship Scheme capital grants); • Large agricultural holdings; or • Land used for ordinary agriculture or horticulture. 	<ul style="list-style-type: none"> • Land at ALC Grade 4; • Arable or pasture grassland; or • Medium to coarse soil with some resistance to structural damage.
Negligible	Receptor generally tolerant of changes such as loss of recreational activity/area, loss of land area, soil degradation etc.	
	<ul style="list-style-type: none"> • No environmental stewardship schemes or other environmental management schemes (such as Countryside Stewardship Schemes). 	<ul style="list-style-type: none"> • 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.

26. The ALC grades and descriptions following 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 22.7.
27. 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 below. Grade 3 land can be subdivided into 3a (good) and 3b (moderate).

28. BMV land is the land which is most flexible, productive and efficient and 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 preliminary assessment, and taking into consideration a worst-case scenario, all Grade 3 land will be classified as BMV.

Table 22.7 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 and/or the level of yield. More demanding crops generally have a lower or more variable yield than on Grade 1 and 2 land.
Subgrade 3a – Good quality agricultural land	Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
Subgrade 3b – Moderate quality agricultural land	Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
Grade 4: Poor quality agricultural land	Land with significant limitations that considerably restrict the type and/or 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.

22.4.3.1.2 Magnitude

29. The magnitude of an impact on a receptor is defined based on the spatial extent, duration, frequency and severity of the effect. The potential impacts may be adverse, beneficial or neutral.
30. Impact magnitude is assessed according to the criteria defined in Table 22.8.

Table 22.8 Definition of magnitude for land use and agriculture

Magnitude	Definition	
	Land Use	Agriculture
High	<ul style="list-style-type: none"> • Permanent (>10 years) / 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. 	<ul style="list-style-type: none"> • Permanent loss (+10 years) 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.
Medium	<ul style="list-style-type: none"> • Moderate or long-term (5-10 years) 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. 	<ul style="list-style-type: none"> • Medium to long term (2 - 10 years) loss of >20ha of Grade 1, 2 or 3 agricultural land or >60% of the total regional resource; • Full land recovery expected within 5 - 10 years; • >20ha of soil is temporarily (less than 2 years) unsuitable for agriculture; or • <10ha of any agricultural land permanently lost from agriculture.
Low	<ul style="list-style-type: none"> • Temporary change affecting usability, risk or value over the short-term (<2 years); 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. 	<ul style="list-style-type: none"> • Short term (less than 2 years) 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 <1ha is permanently lost from agriculture.
Negligible	<ul style="list-style-type: none"> • Minor permanent or temporary change, undiscernible over the medium- to short-term, with no effect on usability, risk or value. 	<ul style="list-style-type: none"> • No identifiable material change to the soil resource; or • Small areas <1,000m² is permanently lost from agriculture.

22.4.3.2 Significance of effect

31. The assessment of significance of an effect is a function of the sensitivity of the receptor and the magnitude of the impact (see Chapter 6 EIA Methodology (Volume I) for further details). The determination of significance is guided by the use of a significance of effect matrix, as shown in Table 22.9. Definitions of each level of significance are provided in Table 22.10.
32. Likely significant effects identified within the assessment as major or moderate are regarded within this chapter as significant. Appropriate mitigation has been identified, where possible, in consultation with the regulatory authorities and relevant stakeholders. The aim of mitigation measures is to avoid or reduce the overall significance of effect to determine a residual effect upon a given receptor.

Table 22.9 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	Negligible	Negligible	Negligible	Minor	Minor	Moderate
	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

Table 22.10 Definition of effect significance

Significance	Definition
Major	Very large or large change in receptor condition, both adverse or beneficial, which are 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 are 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.

22.4.4 Cumulative effects assessment methodology

33. The cumulative effects assessment (CEA) considers other plans, projects and activities that may result in cumulative impacts on receptors with North Falls. Chapter 6 EIA Methodology (Volume I) provides further details of the general framework and approach to the CEA.
34. For land use and agriculture, these activities include other large-scale linear projects such as cable installations for other offshore wind farms; large-scale housing projects; large scale commercial and industrial projects, changes to infrastructure and community facilities and changes to agricultural land use.

22.4.5 Transboundary effects assessment methodology

35. The transboundary assessment considers the potential for transboundary effects to occur on land use and agriculture receptors as a result of North Falls; either those that might arise within the Exclusive Economic Zone (EEZ) of European Economic Area (EEA) states or arising on the interests of EEA states e.g. a non UK fishing vessel. Chapter 6 EIA Methodology (Volume I) provides further details of the general framework and approach to the assessment of transboundary effects.
36. For land use and agriculture, there is no potential for transboundary effects and it has been scoped out of the assessment.

22.4.6 Assumptions and limitations

37. Potential effects to assets are based on a quantitative assessment where possible, as outlined in Table 22.6 and Table 22.8, in order to predict the effect on land use and agricultural activities, particularly during the construction phase. However, it is accepted that perceptions, particularly with respect to receptor sensitivity, may differ between individuals. The assessment undertaken within this chapter is based on expert judgement by competent professionals experienced in undertaking EIA, as set out in Chapter 1 Introduction (Volume I) and is therefore considered to be a robust assessment of the effects identified.
38. 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.
39. Impacts on soil resources are not predicted to extend beyond the direct study area (onshore project area). Therefore, any impacts to the wider area are not discussed here. The published soil data used to undertake this study 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, however the published soils data is considered sufficient to inform the assessment presented within this chapter.
40. ALC surveys are not proposed to be undertaken to inform the baseline, as the value of these is only in differentiating between ALC Grade 3a and 3b, and for the purposes of assessment, as a worst case all Grade 3 land is assumed to be BMV (i.e. 3a). All effects upon Grade 3 land arising from the Project will be temporary, with permanent effects occurring on Grade 1 or 2 land (see Section 22.6.3.2).

22.5 Existing environment

41. This section describes the existing environment in relation to land use and agriculture. It is based on desk-top study of sources, outlined in Table 22.5 as a basis for the preliminary impact assessment.
42. Essex is a rural county in which over 68% of the county is graded agricultural land not included as part of green infrastructure. The major land use in rural

areas of Essex is agriculture which has considerable influence on landscape character and natural habitats (Green Essex, 2019).

43. Essex retains many historic landscape features and has one of the longest coastlines in the country, much of which is of international significance for wildlife. The Greater Essex coast is extremely diverse in nature, varying from a largely open rural landscape with numerous historic and archaeological features, to the more heavily built-up environment which exists around Harwich Port and Clacton.
44. Essex is also a highly valued water and land-based resource providing opportunities for recreation, tourism, agriculture, shellfisheries and many other forms of employment. The county is broadly an open maritime landscape of marshes, creeks and eroding cliffs.
45. Table 22.11 below shows the broad habitats that make up the landscape and land use of Essex.

Table 22.11 Land use and landscape (Place Services, 2017)

Broad Habitat (Grasslands merged)	Area (ha)
Arable and Horticulture	210,328.04
Broad leaved, mixed and yew woodland	23,719.07
Built up areas and gardens	33,491.83
Coniferous woodland	949.83
Heathland	31.37
Fen marsh and swamp	2.85
Open freshwater	2,864.04
Improved grassland	66,162.59
Inland rock	670.20
Littoral rock	73.06
Littoral sediment	9,320.41
Salt water	1,697.77
Supra-littoral sediment	34.48
Grassland with conservation value	7,408.67

46. Urban areas including Southend-On-Sea, Colchester and Chelmsford are adjacent to, but outside of, the onshore project area.
47. The landfall, onshore cable route and onshore substation are all located within primarily agricultural land, with some areas of improved or semi-improved grassland, mixed deciduous woodland, coniferous plantations, hedgerows and waterbodies. Further information on the habitats and ecology of the onshore project area can be found in Chapter 23 Onshore Ecology (Volume I).

22.5.1 Land Use

22.5.1.1 *Land Use and Agriculture Policies and Designations*

48. A review of Tendring District Council Local Plan (2021) and Essex Green Infrastructure Strategy (2020) 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 site allocation maps for Tendring District Council.
49. The onshore project area overlaps with the Holland Haven Country Park, Holland Haven Local Nature Reserve and Holland Haven Marshes Site of Special Scientific Interest (SSSI). This site is located along the coast between Clacton-on-Sea and Frinton-on-Sea (as illustrated on Figure 23.1, Volume II).
50. Essex has over 1,600 Local Wildlife Sites (LWS), which play a key role in the conservation of Essex's biodiversity. An LWS designation is non-statutory but it recognises the value of a site for wildlife. Many sites are of county value and some are of regional importance. They are often designated because they support characteristic or threatened species or habitats. Sites may be privately or publicly owned and vary in size and shape from small meadows, green lanes, dykes and hedges to much larger areas of ancient woodlands, heathland, greens, commons and marsh.
51. The onshore project area borders Simon's Wood LWS (Thorpe-Le-Soken district) and Great Holland Pits Local Wildlife Trust site. These sites are discussed furthered in Chapter 23 Onshore Ecology (Volume I).
52. The onshore project area does not cross through any preferred sites allocated for housing, commercial, employment or special policy under Tendring District Council (adopted 2022).

22.5.1.2 *Agri-environment Schemes*

53. Agri-environment schemes require land managers, including farmers, to implement environmentally beneficial management and to demonstrate good environmental practice on their land.
54. The Environmental Stewardship Scheme (ESS) allows 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).
55. The scheme was launched in March 2005 to build on the Environmentally Sensitive Area Scheme, Countryside Stewardship Scheme and the Organic Farming Scheme that were running prior to 2005. The ESS is administered by Natural England on behalf Defra.
56. 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 or land managers whose land is either wholly or partly managed organically;
 - 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.
57. Countryside Stewardship (CS) has replaced the ESS. The overarching aim of CS 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.
58. Similar to the previous ESS, CS 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 are 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.
 - Capital Grants – These are typically for two years and there are 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.
59. Environment Land Management schemes (ELMS) were planned from 2022 (although they have yet to be implemented) and will eventually replace CS. 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;
 - Landscape Recovery Scheme; and
 - Countryside Stewardship and Countryside Stewardship Plus.
60. The location and area of the agri-environment schemes within the onshore project area are shown in Figure 22.3 (Volume II) and Table 22.12.

Table 22.12 Agri-environment schemes within the onshore project area

Scheme	Count	Area (Ha) of ESS within the onshore project area	% of the onshore project area
Entry Level Stewardship	N/A	N/A	N/A
Entry Level plus Higher Level Stewardship	2	240.90	20.71
Higher Level Stewardship	N/A	N/A	N/A
Organic Entry Level Stewardship	N/A	N/A	N/A
Organic Entry Level plus Higher Level Stewardship	N/A	N/A	N/A
Countryside Stewardship Mid-Tier	6	267.15	22.96
Countryside Stewardship Higher Tier	3	174.32	14.98
Countryside Stewardship Wildlife offers	N/A	N/A	N/A
Countryside Stewardship Capital grants	1	50.03	4.30

61. The onshore substation zone is situated on a Middle Tier CS and the onshore cable route crosses Entry Level plus Higher Level Stewardship Scheme agreements, in addition to six Mid-Tier, three Higher Tier and one Capital Grant CS. Therefore, it is anticipated that elements of construction, operation and decommissioning of the onshore substation and the onshore cable route, such as cable trenching and cable installation could potentially affect land subject to an agri-environment scheme. The final extent of land subject to agri-environment schemes affected during the Project's construction, operation and decommissioning will not be known until the onshore project area is refined down to a final onshore cable route and onshore substation footprint, which will be presented in the Project's ES.

22.5.1.3 *Injurious Weeds and Invasive Species*

62. Invasive non-native species represent a significant threat to native biodiversity and can lead to severe adverse environmental and economic impacts. An Extended Phase 1 Habitat Survey was undertaken in September and October 2021 and March 2022 by Royal HaskoningDHV which recorded giant hogweed *Heracleum mantegazzianum* within the survey area and one ditch contained water fern *Azolla filiculoides* over approximately a five-metre length (see Chapter 23 Onshore Ecology (Volume I)).

22.5.1.4 *Utilities*

63. There are a number of utilities identified throughout the onshore project area. These include major and minor (domestic) utilities, which are primarily routed under the public highway.
64. The majority of the identified utilities crossing the onshore project area are for domestic services that include telecommunications, electricity, water, gas, sewage, unspecified pipeline and street lighting. There is a major Affinity Water main that runs parallel to the onshore project area for approximately 12km between Great Holland and the A120. Consideration of this water main has been a key consideration during the Project's site selection in this area.
65. The landfall search area overlaps with the existing Gunfleet Sands Offshore Wind Farm (OWF) underground transmission cable at landfall (near Holland-on-Sea). Figure 22.6 (Volume II) provides detail of the utilities of major and national importance that cross the onshore project area. It should be noted that the landfall search area is much larger than the actual land area that will be affected by onshore infrastructure.

22.5.1.5 *Open access and common land*

66. Under the CRoW Act 2000 the public are not restricted to paths, but can freely walk on mapped areas of mountain, moor, heath, downland and registered common land, known as open access land.
67. There are no areas of open access and common land within the footprint of the onshore project area, and these land use types are therefore not considered further within this chapter.
68. Although not classified as open access land, the beach and intertidal area between Clacton-on-Sea and Frinton-on-Sea will have underground cables associated with the Project installed under this land use type.
69. PRoWs are considered further in Chapter 32 Tourism and Recreation (Volume I).

22.5.2 *Agriculture and Soils*

22.5.2.1 *Agricultural Activities*

70. Farming is a major part of the Essex economy growing £400 million worth of produce and employing over 8,000 people in the county (Essex County Council, 2022).
71. Almost 75% of the county's land area is farmland with 5,000 hectares of land used to grow outdoor vegetables.
72. Predominant farming types in the East of England region in 2019 were cereal farms which accounted for 51% of farmed area in the region and general cropping farms which covered an additional 33% of farmed area.
73. Arable farming is common throughout Essex, with cereal crops dominating the farmed landscape. Farm sizes range from less than 5ha to more than 100ha (Defra, 2021). Crops grown include cereals and combinable crops (wheat, barley, and oil seed rape) (Defra, 2021).

74. The total area of farmed land in Essex Haven Gateway (consisting of 828 farm holdings in Tendring, Braintree and Colchester districts) is 99,905 ha (Defra, 2021). The footprint of agricultural land in the wider onshore project area is 950.16 ha, which constitutes approximately 0.94% of the county resource.

22.5.2.2 Agricultural Land Classification

75. 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 22.7.

76. The onshore project area primarily consists of ALC Grade 3, but ranges from Grade 1 to Grade 4 and includes some areas of urban land (see Figure 21.4, Volume II). The landfall at Great Holland crosses ALC Grade 4 land. The onshore project area does not cross any ALC Grade 5 land. The onshore substation zone is located within ALC Grade 1 land.

77. The percentage of land of different ALC grades within the onshore project area is presented in Table 22.13.

Table 22.13 ALC grades within the onshore project area

ALC Grade	Land comprised of ALC within the onshore project area (ha)	% ALC Grade land within the onshore project area
1	114.49	9.84
2	235.14	20.21
3	637.48	54.80
4	143.11	12.30
Urban	1.47	0.13

22.5.2.3 Soil type

78. This section provides a description of the soils found within the onshore project area, including the type, drainage, texture, fertility and moisture.

79. Reference should be made to Chapter 21 Water Resources and Flood Risk (Volume I) 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 project area. 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 may differ between and within individual fields and will be captured within the SMP.

80. The soils within the onshore project area range from slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils to loamy and clayey soils of coastal flats with naturally high groundwater. The onshore project area is dominated by slightly acidic loamy soils in the north and slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils in the south.

81. The soils around the landfall primarily consist of loamy and clayey soils of coastal flats with naturally high groundwater.

82. The soils around the onshore substation zone options consist of slightly acidic loamy and clayey soils with impeded drainage.
83. The soils along the onshore project area are predominantly of moderate to high natural fertility (without the addition of fertilisers), owing to the slightly acidic but base-rich nature of the soils.
84. Table 22.14 provides additional detail on the characteristics of the soil types found within the onshore project area (Cranfield University, 2020).

Table 22.14 Soil types within the onshore project area

Soil characteristics	Soil description
Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils	
Texture	Loamy and clayey
Drainage	Impeded drainage
Natural Fertility	Moderate
Typical Habitats	Seasonally wet pastures and woodlands
Landcover	Grassland and arable, some woodland
General cropping	Mostly suited to grass production for dairy 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.
Area (ha) within onshore project area	505.10
Percentage (%) of the onshore project area	43.42
Slightly acid loamy and clayey soils with impeded drainage	
Texture	Loamy some clayey
Drainage	Slightly impeded drainage
Natural Fertility	Moderate to high
Typical Habitats	Wide range of pasture and woodland types
Landcover	Arable and grassland
General cropping	Reasonably flexible but more suited to autumn sown crops and grassland; soil conditions may limit safe groundwork and grazing, particularly in spring.
Area (ha) within onshore project area	509.44
Percentage (%) of the onshore project area	43.79
Loamy and clayey soils of coastal flats with naturally high groundwater	
Texture	Loamy and clayey
Drainage	Naturally wet
Natural Fertility	Lime-rich to moderate
Typical Habitats	Wet brackish coastal flood meadows
Landcover	Arable, some grassland

Soil characteristics	Soil description
General cropping	Lighter soils support a wide range of crops and are highly productive as they contain much available water and are stoneless and flat. Heavier soils are less easily worked and favour grass.
Area (ha) within onshore project area	109.30
Percentage (%) of the onshore project area	9.40

22.5.2.4 Soil natural capital, ecosystem services and carbon resource

85. 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 22.15.

Table 22.15 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	Description
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.
Regulation functions	Regulation of major elemental cycles – macronutrients (N, P and K) 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 sites/structures (e.g., burial grounds).

86. 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 gases. This may also affect other ecosystem services such as food security, biodiversity and storage of water. Conversely, agricultural management practices and the use of waste materials may allow more carbon to be stored in soils. It should be noted, however, that currently evidence of a direct linkage between land management

activities, changes in soil carbon and greenhouse gas emissions is poor. The highest concentration of carbon storage is in blanket peats. These are not found within the onshore project area.

87. 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).

22.5.3 Future trends in baseline conditions

88. In the event that North Falls is not developed, an assessment of the future conditions for land use and agriculture has been carried out and is described within this section. With no development, baseline conditions will continue to change following natural trends and increasing influence from climate change.
89. Essex is one of the top 10 areas at risk of surface water flooding in the UK. The number of houses in Greater Essex at risk from surface water flooding, river flooding and flooding associated with sea level rise are summarised in Table 22.16.

Table 22.16 Houses at risk from flooding in Essex

Type of flood risk	Number of houses at risk
Surface water	36,000
Rivers	10,000
Sea	50,000

90. The Essex coastal estuaries are important for UK biodiversity and these areas may be the most affected by coastal change. Coastal zones, semi natural grasslands, wetlands and freshwater habitats are particularly vulnerable to changes in water availability and species range shifts. Biodiversity is likely to face increasing pressure due to changes in soils and invasion of non-native species and diseases.
91. In general, Essex can expect more frequent extreme weather events (including storms, extreme cold weather) and milder and wetter winters as well as hotter, drier summers by 2080.
92. The following sections detail the climate challenge scenarios for Essex if no action is taken:
- Increasing temperatures across the region;
 - Change in seasonal precipitation;
 - Water scarcity;
 - Agriculture and soils; and
 - Rising sea levels.
93. One of the recommendations raised by Szewczyk *et al.* (2020) is for farmland in Essex to adopt Sustainable Land Stewardship practices: 50% by 2030; 75% by 2040 and 100% by 2050. Agricultural production can either deplete or increase carbon stocks, therefore adopting sustainable land stewardship has the potential to:

- Absorb carbon by increasing organic matter in plants, roots and soils; and
 - Lower carbon use through increased productivity, often using less artificial inputs.
94. The adoption of sustainable land stewardship will have associated benefits for biodiversity and water quality.
95. Agriculture and land use contribute 24% of carbon dioxide equivalent (CO₂eq) emissions (IPCC, 2019). There are various strategies for lowering global carbon emissions from agriculture and land use by changing land management practices (Table 22.17).

Table 22.17 Examples of carbon sequestration by agriculture and land use

Carbon sequestration by agriculture and land use	Example carbon sequestration methods
Sustainable Land Stewardship	Silvopasture (trees with grazing)
	Agroforestry and tree intercropping
	Organic and regenerative agriculture
	Cover crops (legumes, clovers)
	Zero tillage and conservation agriculture
	Reduced nitrogen use
	Integrated nutrient management for nitrogen
	Integrated pest management (cut pesticides)
	Best practice slurry and animal waste use
	Improved grazing by rotational grazing
Natural Green Infrastructure	Land for biodiversity and rewilding
	Natural Urban Habitats
	Peatland
	Existing forest/woodland
	Saltmarsh

96. The baseline review of land use and agriculture in Section 22.5 above shows that the predominant land use in the area of the onshore project area is arable or mixed use agricultural, with some areas of improved or semi-improved grassland, mixed deciduous woodland, coniferous plantations, hedgerows and waterbodies.
97. Chapter 23 Onshore Ecology (Volume I) notes that species associated with farmland environments have declined over the short and long term, with farmland birds and butterflies both declining. Soil erosion is expected to occur naturally over time, depending on weather conditions (exacerbated by climate change) and farming practices.
98. Consequently, the quality and availability of agricultural land could reasonably be expected to decline over time, with some potential offsets by advances in agricultural innovations and technology.

22.6 Assessment of significance

99. The following sections describe the effects upon those land use and agriculture receptors described in Section 22.5 that have the potential to arise because of the construction, operation, and decommissioning phases of the Project. The assessment follows the methodology set out in Section 22.4.3. The assessments are based on the realistic worst-case scenarios set out in Section 22.3.2 and include the incorporation of embedded mitigation set out in Section 22.3.3.

22.6.1 Potential effects during construction: Agriculture

22.6.1.1 *Impact 1: Agricultural Drainage*

100. There is the potential for the earthworks associated with the construction of the landfall, onshore cable route and onshore project substation to impact the natural and artificial field drainage systems within the onshore project area.
101. Existing field drains are expected to be made of ceramic and plaster and are typically found at a depth between 0.5-1.5m. 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 21 Water Resources and Flood Risk (Volume I).
102. Duct installation requires the excavation of the cable trench and stockpiling of soils and has the potential to cause an adverse impact to the field drainage systems. Soil types found within the onshore project area are mostly loamy and clayey soils. It will be necessary to truncate the drainage systems temporarily during excavation and installation of the ducts, install temporary drainage systems and reinstate drainage post-construction.
103. At the onshore substation any existing field drainage would be permanently altered as land would be taken out of use during the operation of the Project. This is discussed further in Section 22.6.3.
104. Embedded mitigation measures (as detailed in Table 22.3) will be utilised to reduce the magnitude of the impact on agricultural drainage and include:
- Maintaining and reinstating land drainage systems during and following construction;
 - The provision of a local specialised drainage contractor (to undertake surveys and create drawings pre- and post-construction, to locate drains and ensure appropriate reinstatement);
 - The implementation of the final CoCP.
105. The embedded mitigation measures outlined above will ensure ongoing drainage of the surrounding agricultural land, in order to avoid any material change to the soil resource.

22.6.1.1.1 *Magnitude of impact*

106. The magnitude of the impact for the onshore cable route would be low, due to the temporary change affecting usability of >20ha soil and associated land drains (<2 years) across the onshore project area, as a worst case for agriculture. This is because agricultural land drains will only potentially be

disrupted during the installation of the onshore cable route in a single operation. The installation of the onshore cable is expected to take up to 12 months.

107. There may be outfalls to agricultural land which would potentially be disturbed during the construction of the onshore substation that may affect the agricultural drainage of the surrounding area. However, at this stage, the potential effects on agricultural land drainage of the substation site are unknown. The potential effects on agricultural land drainage during construction will be considered further in the ES.
108. Therefore, a worst case scenario of low magnitude of impact is assumed for agricultural drainage during construction.

22.6.1.1.2 Sensitivity of receptor

109. Soil types found within the onshore project area are mostly slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils. Field drainage networks, some of which are unmapped and informal, are considered to have a medium sensitivity overall, as they have a limited capacity to accommodate changes such as degradation or poor reinstatement of drainage systems.

22.6.1.1.3 Significance of effect

110. Given the low magnitude of impact due to the scale (>20ha) and timing of the works (short term loss) and the medium sensitivity of the receptor, this represents a minor adverse significance of effect. Therefore, the likely effects on agricultural drainage during construction are not significant in EIA terms.

22.6.1.2 Impact 2: Temporary Loss of Agricultural Land

111. Construction activities within the onshore project area have the potential to either directly take land out of existing use or isolate land which would effectively take it out of use. This would also result in loss of two growing seasons in the land directly taken out of production and the loss of associated productivity. For agricultural land isolated during the construction of the onshore cable route, the effect would be up to 18 months in total.
112. During construction it is unavoidable that land along the onshore cable corridor(s) would temporarily be taken out of its existing land use, however, embedded mitigation measures will be implemented to reduce the potential impacts as far as practicable. These measures are set out in full in Table 22.3 and include the planning and timings of works being discussed with landowners and private agreements to be secured with the relevant landowners and occupiers.
113. Construction activities also have the potential to cause compaction of soil and hinder future agricultural productivity through the use of heavy machinery and disturbance.
114. The majority of the construction footprint would be within areas currently associated with agricultural production. The footprint of the onshore cable route, 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.
115. It is not possible at the PEIR stage to calculate the exact area of land that would be severed. As the route of the cable is developed for the ES submission attempts will be made to minimise the amount of severed land (in conjunction

with landowners) and the extent of land affected will be detailed in the final submission. Land take at the onshore project substation is considered a permanent impact, or an impact for the duration of the Project lifespan. This is discussed as a potential effect during operation in Section 22.6.3.

22.6.1.2.1 Magnitude of impact

116. Without mitigation and based on the worst case parameters set out in Table 22.2, the total construction footprint within agricultural land in Grades 1, 2 and 3 (i.e. BMV) would be >20ha for 24 months, therefore the initial magnitude of impact for Grades 1, 2 and 3 is considered to be medium. Following ongoing route refinement and site selection, the onshore cable route assessed at the ES stage is likely to be significantly reduced from the footprint assessed in this chapter, therefore it is anticipated the impacts at ES stage are likely to be reduced.
117. However, implementation of embedded mitigation as detailed in Table 22.3 (including consultation with landowners, maintaining access to severed land, appropriate timings of works and reinstating land to the pre-construction conditions as soon as reasonably practicable) means it is likely that the amount of land temporarily unsuitable for agriculture is significantly reduced.
118. Therefore, the magnitude of impact is considered to be low.

22.6.1.2.2 Sensitivity of receptor

119. The quality of the land varies from ALC grades 1 – 4 (including urban), however the majority of the land area is ALC grade 3 (637.48 ha) that is subject to temporary land take within the onshore project area. Therefore, the sensitivity of the receptor, in accordance with Table 22.6, is considered to be medium.

22.6.1.2.3 Significance of effect

120. Given the low magnitude of impact and the medium sensitivity of the receptor, the significance of effect is minor adverse. Therefore, the likely effects on temporary loss of agricultural land during construction are not significant in EIA terms.

22.6.1.3 Impact 3: Soil degradation

121. There is the potential for soils to become compacted and for soil structure to deteriorate during construction works, including temporary compound locations, particularly along access routes and where heavy materials and equipment are stored. Similarly, changes to the local drainage may also cause soil structure to deteriorate (this is described in Chapter 21 Water Resources and Flood Risk, Volume I). Deterioration of the soil structure can lead to reduced biological activity, water infiltration, soil porosity and permeability and increased soil strength and risk of erosion (European Commission, 2008). These impacts can lead to reduced fertility and crop yields, should the site be returned to agricultural use post construction.
122. Soil quality can also be adversely affected by spills and leaks of contaminative materials and the drying and decomposition of peaty layers during stockpiling.
123. The following activities proposed during the construction phase have the potential to degrade the existing soil resource:
- Intrusive pre-construction surveys;
 - Removal of trees/vegetation;

- Topsoil stripping and earthworks within the construction footprint;
- Use of the haul road; and
- Stockpiling and reinstatement of soil.

124. Impacts on the soil resource would be minimised through the embedded mitigation detailed in Table 22.3, such as reducing the footprint of the works, limiting the exposure time and adoption of a SMP (which will set out the procedures for the appropriate handling of soils during the works).

22.6.1.3.1 Magnitude of impact

125. Soil within the construction areas would be subject to earthworks including initial stockpiling and movement between stockpiles, however adoption of embedded mitigation measures would result in a low magnitude of impact. The magnitude of impact is considered to be low due to the fact the agricultural land affected by soil degradation is expected to make a full recovery within 5 years (see Table 22.8).

22.6.1.3.2 Sensitivity of receptor

126. The soils in the study area are in general loamy and clayey (as described in Section 22.5.2) and, therefore susceptible to compaction. They are also difficult to handle during wet periods using machinery without causing structural degradation. Embedded mitigation such as a SMP will be adopted and the procedures for appropriate handling are detailed in Table 22.3. The embedded mitigation measures detailed in Table 22.3, will reduce the potential for soil damage.

127. Therefore, the sensitivity of the receptor is considered to be medium.

22.6.1.3.3 Significance of effect

128. Given the low magnitude of impact and medium sensitivity of the receptor, the significance of effect for soil degradation is minor adverse. Therefore, the likely effects on soil degradation during construction are not significant in EIA terms.

22.6.1.4 Impact 4: Loss of soil to erosion

129. Soil can be susceptible to erosion, with some soil types more susceptible than others under certain weather conditions. Excavation, storage and reinstatement exposes the soils and creates an opportunity for potential erosion to occur.

130. Embedded mitigation as set out in Table 22.3 is proposed to reduce any effects from loss of soil resource by erosion including adherence to the MAFF (2000) Good Practice Guide for Handling Soils and Defra (2009) Construction code of practice for the Sustainable Use of Soils on Construction Sites.

131. These mitigation measures would be captured in a SMP that the contractor would be required to comply with, which will employ best practice techniques to protect the soil resource.

132. It is expected that these mitigation measures will reduce the predicted risk associated with loss of land for agriculture, which would impact upon its associated usability and value.

22.6.1.4.1 Magnitude of impact

133. The Project would require excavation during construction for the onshore cable route, landfall and onshore project substation. The potential magnitude of impact for the onshore cable route is therefore predicted to be medium, due to

the temporary short term loss of >20ha of the BMV agricultural land (ALC grades 1, 2 and 3).

134. The potential magnitude of impact for the onshore substation is predicted to be medium, due to the permanent loss of <10ha of BMV agricultural land (ALC grade 1).

22.6.1.4.2 Sensitivity of receptor

135. Given the construction footprint is dominated by loamy and clayey soils, which have a relatively cohesive nature, it is not considered that the soils would be highly vulnerable to erosion and the sensitivity of the soils to erosion is therefore considered to be low.

22.6.1.4.3 Significance of effect

136. Prior to mitigation, the greatest magnitude arising from one element of the onshore infrastructure is medium magnitude, on a low sensitivity receptor, resulting in a minor adverse significance of effect. Therefore, the likely effects on soil erosion during construction are not significant in EIA terms.

22.6.2 Potential effects during construction: Land use

22.6.2.1 Impact 5: Impact to Agri-environment Schemes

137. During the construction period there would be the potential for impacts on agri-environment schemes within the onshore project area. The effect on individual landowners/occupiers is likely to be specific to their own scheme, which would need to be discussed between the Applicant, landowners, occupiers and Natural England prior to construction. Depending on the agreement objectives and location of the construction works, the impacts could range from the agreement ceasing entirely to no impact on the agreement. As such, this assessment looks at the effects in general terms rather than on an agreement-by-agreement basis.
138. As a result of construction, two potential connected impacts on agri-environment schemes are anticipated:
- Ecological – loss of the agreements and the substantive agri-environmental objectives of the scheme (i.e. loss of field margins); and
 - Financial – loss of the agreements and the impact on overall farm business income.
139. Ecological features that are likely to be subject to agreements, such as wetland scrapes, have been avoided in selection of all elements of the onshore project area (where practicable). A number of rivers, ditches and hedgerows would be crossed; however these would be crossed in a perpendicular manner where possible/practicable to minimise disturbance to those features, and replanted/reinstated following completion of the works. A number of sensitive features such as Ordinary Watercourses will be crossed using trenchless techniques (e.g. HDD) (this is considered further in Chapter 21 Water Resources and Flood Risk, Volume I).
140. Following the completion of construction, all areas subject to agri-environmental agreements would be reinstated (see Chapter 23 Onshore Ecology, Volume I).

141. The landfall zone for North Falls interacts with two ESS classified at Entry Level plus Higher Level Stewardship, covering an area of 240.90 ha, which represents 20.71% of the onshore project area (see Figure 22.3, Volume II).
142. The onshore cable corridor(s) cross ten CS ranging from Capital Grants to Higher Tier CS (Table 22.12), covering an area of 491.50 ha, which represents 42.25% of the onshore project area (see Figure 22.3, Volume II).
143. There is potential for a certain amount of disruption to agri-environment schemes as a direct result of loss of land during the construction affecting features such as field margins. The total land within an ESS or CS agreement crossed by the onshore project area is 732.40ha (62.96% of the onshore project area).
144. In some instances, it may not be possible to avoid land managed under an agri-environment scheme, resulting in a landowner / occupier being unable to meet the terms of an agreement. The magnitude of impact could range from the termination of an agreement to no impact, or a minor and temporary change such as the need to make changes to grazing or cropping requirements. For the purposes of DCO submission, the impact on specific agreements will only be known once the final onshore project area 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 schemes in place will depend on the extent and duration of construction works within land parcels managed under an ESS or CS, and the terms and conditions attached to the agreement in place.
146. Ongoing refinement of the onshore project area (most notably the onshore cable corridor(s)) will take into consideration land parcels managed under agri-environment schemes, with a view to avoiding these land parcels where possible. Landowner engagement will form a key part of the onshore cable corridor refinement, during which information relating to the location, extent and content of agri-environment schemes will be gathered and fed back into the refinement process for North Falls. This includes gathering information from landowners on any ecological constraints or opportunities associated with existing agri-environmental schemes.
147. Wherever practicable, appropriate planning and timing of works will be agreed with landowners and occupiers, subject to individual agreements, to reduce conflicts.
148. Private agreements (or compensation in line with the relevant statutory legislation) will be sought between North Falls and relevant landowners/occupiers regarding any measures required in relation to loss of payments under the agri-environment schemes incurred as a direct consequence of the construction phase of the Project. Private agreements will help to manage the short term (up to 2 years) loss of agricultural land and ensure full land recovery within 5 years post-construction.
149. The embedded mitigation mentioned above will reduce the temporary risk to agri-environment schemes, as individual and private agreements as well as appropriate planning and timing of works will result in a minimal effect on usability, risk or value with no effect on regulatory compliance.

22.6.2.1.1 Magnitude of impact

150. It is expected that only a small proportion of land under ESS and CS agreements would be affected by the construction works, even in a worst-case scenario, due to the linear nature of the cable corridor(s) within which this land lies. With the embedded mitigation mentioned above and in Table 22.3, along with the ongoing refinement of the onshore cable corridor(s), these earthworks could potentially lead to some temporary loss of agri-environment land across construction areas, representing a low magnitude of impact.

22.6.2.1.2 Sensitivity of receptor

151. The onshore project area includes two ESS classified as Entry Level plus Higher Level Stewardship Scheme and ten CS (three of which are classified at Higher Tier). There is also one Mid-Tier CS which crosses the onshore substation zone, which may result in potential financial or ecological losses during construction and operation (discussed further in Section 22.6.3.3) of the onshore substation. Therefore the sensitivity of the receptor is considered to be medium.

22.6.2.1.3 Significance of effect

152. Given the low magnitude of impact, on a medium sensitivity receptor, the significance of effect on agri-environment schemes is minor adverse. Therefore, the likely effects on agri-environment schemes during construction are not significant in EIA terms. Notwithstanding this, the Applicant acknowledges that the impacts at an individual level could, in a worst case scenario, be significant and therefore every effort will be made to engage with those landowners potentially affected.

22.6.2.2 Impact 6: Utilities

153. The majority of the identified utilities crossing the onshore project area are for domestic services that include telecommunications, electricity, water, gas, sewage, unspecified pipeline and street lighting. The onshore project area will also cross a buried major Affinity Water water main south of the A120.

154. The onshore project area passes close to the existing Gunfleet Sands OWF underground transmission cable at landfall (near Holland-on-Sea) (Figure 22.6, Volume II).

155. Protective provisions and/or side agreements will be agreed with affected utilities as part of the DCO application process. North Falls will undertake utility crossings or diversions in accordance with the appropriate industry standards for such crossings.

156. The continuity of public water supplies during construction works would be ensured. The onshore cable route has been selected to avoid major utilities where possible/practicable. Private water supplies are covered in Chapter 21 Water Resources and Flood Risk (Volume I).

22.6.2.2.1 Magnitude of impact

157. Through protective provisions agreed via the DCO and agreements with utility undertakers, the risks to utilities will be avoided. Therefore, the magnitude of impact on utilities is considered to be low.

22.6.2.2.2 Sensitivity of receptor

158. The onshore project area crosses domestic utility services and one major Affinity Water water main which is buried south of the A120. However, the continuity of water supplies during construction works would be ensured through

protective provisions secured in the DCO and consultation with utility undertakers. Therefore, the sensitivity of utilities as a receptor is low.

22.6.2.2.3 Significance of effect

159. Mitigation measures outlined above and detailed in Table 22.3 will be adhered to at all times, as required by the DCO. Given the low magnitude of impact and low sensitivity of the receptor, the significance of effect on utilities is considered to be negligible. Therefore, the likely effects on utilities during construction are not significant in EIA terms.

22.6.3 Potential effects during operation: Agriculture

160. This section describes the potential impacts arising during the operational phase of the Project. Reference should also be made to Chapter 5 Project Description (Volume I) for further details of the operational phase.

22.6.3.1 Impact 7: Agricultural Drainage

161. North Falls will primarily be located on rural, agricultural land where there are limited existing formal surface water drainage systems. However, there are a large number of agricultural land drains and Ordinary Watercourses.

162. Permanent above ground infrastructure and hard standing at the onshore substation, as well as presence of buried cables has the potential to affect the field / land drainage during operation (see Chapter 21 Water Resource and Flood Risk (Volume I) for further detail).

163. As stated in Table 22.3, the Applicant will appoint a land drainage consultant to develop pre-and post-construction drainage plans. Pre-construction drainage will be installed and maintained during construction. Post-construction, the approved post-construction drainage scheme will be implemented over the onshore cable corridor(s). All cable construction compounds and temporary haul roads will be fully reinstated to their original land use.

164. The backfilling of subsoil and then topsoil in the cable trenches will prevent a conduit from forming and ensure there are no changes to the local flow rates due to permeability changes.

165. Whilst there will be a permanent change to the field drainage at the onshore substation site during operation, this will be compliant with the Flood Risk Assessment (FRA) as presented in Appendix 21.3 (Volume III) and will ensure that any water discharged from the substation into the surrounding drainage network would be at the existing greenfield runoff rate.

22.6.3.1.1 Magnitude of impact

166. As drainage would be reinstated post-construction and drainage requirements at the onshore substation would be compliant with the FRA, there is a measurable permanent change with minimal effect on usability, risk or value with no effect on regulatory compliance. As such the magnitude of impact on agricultural drainage during operation is considered to be low.

22.6.3.1.2 Sensitivity of receptor

167. Given that drainage would be reinstated and drainage requirements at the onshore substation would be compliant with the FRA, it is considered that the sensitivity of receptor is low.

22.6.3.1.3 Significance of effect

168. Given the magnitude of impact is low and the sensitivity of receptor is low, it is considered that the significance of effect would be negligible upon agricultural drainage during the operational phase. Therefore, the likely effects on agricultural drainage during operation are not significant in EIA terms.

22.6.3.2 Impact 8: Permanent loss of agricultural land

169. The onshore export cables will be buried to a depth of at least 0.9m and following reinstatement, normal agricultural activities will be able to continue following completion of the construction works.

170. 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 occasional visits to jointing bays to carry out routine integrity tests, which would typically be accessed via man-hole covers.

171. Up to 196 link boxes will also be present above ground for routine maintenance along the cable corridor(s) (link boxes could be present approximately every 500m along the cable route). The final design has yet to be determined but the link boxes could be above ground structures up to 1.5m tall, 0.6m deep and 1m wide with a footprint of 1.5m² per box or may be below ground and accessed via manhole covers at ground level (an above ground marker would then be required to mark the location of each link box).

172. 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. Link boxes would not be required at all jointing bay locations but as a worst case it is assumed that they could be required up to a frequency of one every 500m.

173. In addition up to four link boxes will be situated in proximity to the Transition Joint Bays (TJBs) at the landfall. TJBs are underground structures that house the joints between the offshore export cables and the onshore export cables.

174. The footprint of the onshore substation would represent permanent land take for the duration of the operational phase.

22.6.3.2.1 Magnitude of impact

175. The total permanent land take for the footprint of the onshore substation is approximately 8ha. North Falls would require the installation of up to 196 link boxes, located up to every 500m along the onshore export cable corridor. Should link boxes be installed above ground they would have a footprint of 1.5m x 1m and 1.5m tall. This would represent a total land take of approximately 294m² across a 24km length cable route. The total permanent land take would therefore be approximately 104,594m² across the Project.

176. Therefore, the impact to agricultural productivity is considered to be of low magnitude.

22.6.3.2.2 Sensitivity of receptor

177. Link boxes installed along the onshore cable route would result in the permanent loss of land that varies between ALC grades 1-4, but the majority of the land area is comprised of ALC grade 3. This represents a high sensitivity receptor, when considering permanent loss of agricultural land.

178. The onshore substation is proposed on land classified as ALC grade 1, which when taken out of land use permanently, represents a high sensitivity receptor.

22.6.3.2.3 Significance of effect

179. Given the magnitude of impact is considered to be low, on a high sensitivity receptor, the significance of effect is therefore predicted to be of moderate adverse significance. Therefore, the likely effects on permanent loss of agricultural land during operation are significant in EIA terms.

22.6.3.3 Impact 9: Soil heating

180. 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 considered 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.

22.6.3.3.1 Magnitude of impact

181. Any effect on soil heating would be highly localised to the area immediately surrounding the cable system. Where laid in trenches, cables would be buried at a minimum depth of 0.9m, with the principal root growth zone generally accepted to be within the first 50mm of the soil from the surface. In addition, the use of CBS will remove any material heat transfer from the cables to the surrounding environment.
182. Operation of the onshore cable will result in no change in the temperature at the ground surface or first 50mm of soil. Overall, therefore no impact is anticipated.

22.6.4 Potential effects during operation: Land use

22.6.4.1 Impact 10: Agri-environment schemes

183. Following the construction phase, land associated with landfall and the onshore cable corridor(s) that is located within agri-environment schemes will be reinstated to its original condition, with the exception of the link boxes.
184. The onshore substation zone and link boxes represent the permanent infrastructure that would not be reinstated during operation and have the potential to affect land designated under agri-environment schemes.
185. There would be a total of up to 196 link boxes (footprint of 1.5m x 1m x 1.5m per link box) under the worst case assumptions (Table 22.2), some of which could potentially impact on land designated under an agri-environment scheme. Link boxes would be avoided on land designated under an agri-environment scheme (in particular a Higher Level ESS or a Higher Tier CS) wherever possible.
186. The onshore project area crosses two Entry Level plus Higher Level Stewardship Schemes at landfall (Figure 22.3, Volume II), which may be affected by the installed link boxes along the onshore cable route.
187. The onshore project area crosses three Higher Tier CS (near Thorpe-le-Soken), six Mid-tier CS and one Capital Grant CS (near Horsley Cross adjacent to the A120).

188. One of the Mid-tier CS also crosses the onshore substation zone where permanent infrastructure could potentially be located. Avoiding the siting of permanent infrastructure within the Mid-tier CS during the Project's ongoing site selection process would mitigate potential effects upon this agri-environment scheme.
189. Where indirect impacts to an agreement cannot be avoided, these will be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate.

22.6.4.1.1 Magnitude of impact

190. The magnitude of impact on landowners / occupiers from the presence of the onshore substation and the link boxes along the onshore cable route is specific to their own scheme, which would need to be discussed between the Applicant, landowners, occupiers and Natural England prior to construction.
191. Landowner engagement will form a key part of the onshore project area refinement, during which information relating to the location, extent and content of agri-environment scheme agreements will be gathered and fed back into the refinement process for North Falls. This includes gathering information from landowners on any ecological constraints or opportunities associated with existing agri-environment schemes.
192. All land under an agri-environment scheme identified within the onshore cable corridor(s) will be reinstated following construction, with the exception of link boxes and the permanent infrastructure associated with the onshore substation.
193. Although a permanent land take exists for link boxes, whereby the existing land use would not be able to continue on <0.05ha of land in total across the onshore project area and could affect up to two Entry Level plus Higher Level Stewardship Schemes at landfall and up to 10 CS (including Capital Grants, Mid-Tier and Higher-Tier CS) as shown on Figure 22.3, Volume II), the geographical scale is so low in each instance not have a material change on the function of any individual agri-environmental scheme. As such, a magnitude of impact of negligible is anticipated.

22.6.4.1.2 Sensitivity of receptor

194. As identified in Table 22.6, the sensitivity of Entry Level plus Higher Level ESS and Mid-Tier CS are considered to be medium while the sensitivity of Higher-Tier CS is considered to be high. Therefore the sensitivity of agri-environment schemes during operation are considered to be high as a worst case.

22.6.4.1.3 Significance of effect

195. The magnitude of impact is negligible, on a high sensitivity receptor, therefore the significance of effect on the management requirements under agri-environment schemes is considered to be minor adverse. Therefore, the likely effects on agri-environment schemes during operation are not significant in EIA terms.

22.6.4.2 Impact 11: Utilities

196. The potential exists for maintenance activities to affect utilities, since these activities may require access to the buried cables. 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 project area are for

domestic services that include telecommunications, electricity, water, gas, sewage and street lighting.

197. The onshore project area passes close to the existing Gunfleet Sands OWF underground transmission cable at landfall (near Holland-on-Sea) (as shown on Figure 22.6, Volume II).
198. Any utilities maintenance would involve contacting utility providers and identifying the location of existing services prior to maintenance works to ensure no impact to these utilities. Maintenance activities will be undertaken in accordance with protective provisions as set out in the DCO and/or side agreements.

22.6.4.2.1 Magnitude of impact

199. The onshore project area has been selected to avoid major utilities where possible/practicable, therefore the magnitude of impact on existing utilities during operation would be negligible.

22.6.4.2.2 Sensitivity of receptor

200. Following the mitigation outlined above, the sensitivity of receptor is considered to be negligible.

22.6.4.2.3 Significance of effect

201. Given a negligible magnitude of impact, on a negligible sensitivity receptor, the significance of effect on utilities during operation is considered to be negligible. Therefore, the likely effects on utilities during operation are not significant in EIA terms.

22.6.5 Potential effects during decommissioning

202. This section describes the potential impacts of the decommissioning of the onshore infrastructure with regards to impacts on land use and agriculture. Further details are provided in Chapter 5 Project Description (Volume I).
203. It is generally accepted that industry best practice, rules and legislation change and develop over time. As a result, no decision has been made regarding the final decommissioning policy for the onshore export cables. However, the most likely scenario is that the cables would be pulled through the ducts and removed, with the ducts themselves sealed and capped and left in-situ.
204. 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.
205. Whilst details regarding the decommissioning of the onshore substation are currently unknown, considering the worst case scenario which would be the removal and reinstatement of the current land use at the site, it is anticipated that the impacts would be similar or less than to those during construction.
206. The decommissioning methodology would be finalised closer to the end of the lifetime of the Project, so as to be in line with current guidance, policy and legislation at that point. Any such methodology and associated mitigation would be agreed with the relevant authorities and statutory consultees. The decommissioning works could be subject to a separate licensing and consenting approach.

22.7 Potential monitoring requirements

207. It is considered at this stage that no operational monitoring is required for land use and agriculture.

22.8 Cumulative effects

22.8.1 Identification of potential cumulative effects

208. The first step in the CEA process is the identification of which residual effects assessed for North Falls on their own have the potential for a cumulative effect with other plans, projects and activities. This information is set out in Table 22.18. Only potential effects assessed in Section 22.6 as negligible or above are included in the CEA (i.e. those assessed as ‘no impact’ are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 22.18 Potential cumulative effects

Impact	Potential for cumulative effect	Rationale
Construction		
Impacts on agricultural drainage	Yes	Cumulative direct impacts arising from two or more projects are possible given the level of uncertainty regarding the presence and location of drainage systems. 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).
Temporary loss of agricultural land	Yes	Cumulative direct impacts arising from two or more projects are possible. 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 (e.g. loss of earnings from more than one project taking the same parcels of land out of use).
Soil degradation	Yes	Cumulative direct impacts arising from two or more projects are possible. 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 (e.g. loss of earnings from more than one project taking the same parcels of land out of use).
Soil erosion	Yes	Cumulative direct impacts arising from two or more projects are possible. 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 (e.g. loss of earnings from more than one project taking the same parcels of land out of use).
Impacts on agri-environment schemes	Yes	Cumulative direct effects arising from two or more projects are possible. Impacts may occur where project boundaries overlap spatially or temporally on the same landowner/occupier's land. Such impacts have the potential to affect land under agri-environment schemes (e.g. loss of earnings from agri-environment schemes from more than one project taking the same parcels of land out of use).
Impacts on utilities	No	Potentially affected utility providers would be contacted, and the location of existing services would be identified prior to works to ensure there would be no likely significant effect.
Operation		

Impact	Potential for cumulative effect	Rationale
Impacts on agricultural drainage	No	Due to the reinstatement of drainage post construction and adherence with the flood risk assessment, no cumulative effects are predicted during operation.
Permanent loss of land for agriculture	Yes	Cumulative effects may occur at a county scale where impacts to productivity affect the wider agriculture industry.
Impacts on agri-environment schemes	Yes	Cumulative direct effects arising from two or more projects are possible. Impacts may occur where project boundaries overlap spatially or temporally on the same landowner/occupier's land. Such impacts have the potential to affect land under agri-environment schemes (e.g. loss of earnings from agri-environment schemes from more than one project taking the same parcels of land out of use).
Impacts on utilities	No	Potentially affected utility providers would be contacted and the location of existing services would be identified prior to works to ensure there would be no likely significant effect.
Decommissioning		
Decommissioning strategies have not yet been finalised; however, the cumulative effects are expected to be the same as those of initial construction.		

22.8.2 Other plans, projects and activities

209. The second step in the cumulative assessment is the identification of the other plans, projects and activities that may result in cumulative effects for inclusion in the CEA (described as 'project screening'). This information is set out in Table 22.19 below, together with a consideration of the relevant details of each, including current status (e.g. under construction), planned construction period, closest distance to North Falls, status of available data and rationale for including or excluding from the assessment.
210. The project screening has been informed by the development of a CEA project list which forms an exhaustive list of plans, projects and activities within the study area (Section 22.3.1) relevant to North Falls. The list has been appraised, based on the confidence in being able to undertake an assessment from the information and data available, enabling individual plans, projects and activities to be screened in or out.

Table 22.19 Summary of projects considered for the CEA in relation to land use and agriculture (project screening)

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
National Infrastructure Planning						
Five Estuaries Offshore Wind Farm	Pre-application	2028 - 2030	Scoping area directly overlaps with North Falls onshore project area.	High	Yes	The onshore project area for Five Estuaries Offshore Windfarm covers largely the same area as NFOW. There is also a possibility that both projects could be constructed at around the same time, therefore, cumulative effects may occur.
East Anglia GREEN	Pre-application	2027 - 2031	Scoping area directly overlaps with North Falls onshore project area.	Low	Yes	The proposed substation area for East Anglia GREEN is in close proximity to North Falls proposed substation zone. Therefore, cumulative impacts could occur.
East Anglia TWO Offshore Windfarm	Approved (DCO Issued 2022)	Mid 2020s	47	High	No	The onshore infrastructure for this project is not in close proximity to the onshore project area so will not likely have a cumulative effect on land use and agriculture.
Bradwell B new nuclear power station	Pre-application	Predicted 9 – 12 years	21	High	No	The project is not in close proximity to the onshore project area

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						so will not likely have a cumulative effect on land use and agriculture.
Ipswich Rail Chord	Approved (DCO issued 2012)	Built	17	High	No	Ipswich Rail Chord has already concluded construction and will therefore not contribute to cumulative effects during North Falls construction, operation, or decommissioning periods.
Sizewell C Project	Approved (DCO issued 2022)	2022 – 2034	49	High	No	Sizewell C Project is located over 40km from the onshore project area and so will not likely have a cumulative effect on land use and agriculture.
Nautilus Interconnector	Pre-application	Information unavailable	44	Medium	No	The location of onshore infrastructure associated with this project is not known, however, it is highly unlikely to be within close proximity to the onshore project area so will not likely have a cumulative effect on

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						land use and agriculture.
Lake Lothing Third Crossing	Approved (DCO issued 2020)	Over 2 years	76	High	No	The project is over 75km away from the onshore project area so will not likely have a cumulative effect on land use and agriculture.
Richborough Connection Project	Approved (DCO issued 2017)	Built	55	High	No	This project has already been built and is therefore now part of the existing baseline.
Kentish Flats Extension	Approved (DCO issued 2013)	Built	46	High	No	This project has already been built and is therefore now part of the existing baseline.
Sea Link	Pre-application	Information unavailable	20	N/A	No	The location of any onshore infrastructure associated with this project is not known, however, it is highly unlikely to be within close proximity to the onshore project area so will not likely have a cumulative effect on land use and agriculture.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Galloper Offshore Windfarm	Approved	Built	15	High	No	This project has already been built and any onshore infrastructure is now part of the baseline.
A12 Chelmsford to A120 widening scheme	Pre-examination	Information unavailable	27	Medium	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Rivenhall IWMF and Energy Centre	Pre-application	Information unavailable	27	Medium	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Essex County Council						
Elmstead Hall, Elmstead, Colchester, Essex	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture.
St. George's Infant School and Nursery, Barrington Road, Colchester, Essex, CO2 7RW	Approved	Information unavailable	9	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						land use and agriculture.
Wilson Marriage Centre, Barrack Street, Colchester, Essex, CO1 2LR	Approved	Information unavailable	9	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Wivenhoe Quarry Alresford Road, Wivenhoe, Essex, CO7 9JU	Report being prepared	Information unavailable	7	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Elmstead Hall, Elmstead, Colchester, Essex, CO7 7AT	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Elmstead Hall, Elmstead, Colchester, Essex, CO7 7AT	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture.
Old Heath County Primary School, Old	Approved	Information unavailable.	8	N/A	No	The project is outside of the onshore project

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Heath Road, Colchester, Essex, CO2 8DD						area for the project so will not likely have a cumulative effect on land use and agriculture, especially when considering the works' localised nature.
Crown Quarry (Wick Farm), Old Ipswich Road, Ardleigh, CO7 7QR	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture.
Wivenhoe Quarry, Alresford Road Wivenhoe, Essex CO7 9JU	Approved	Information unavailable.	7	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture.
Martell's Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU	Out for consultation	Information unavailable	3	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Land at: Elmstead Hall, Elmstead, Colchester, Essex	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						cumulative effect on land use and agriculture.
Land at Martells Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU	Approved	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture.
Land to the south of Colchester Main Road, Alresford, Colchester, CO7 8DB	Report being prepared	Information unavailable	6	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Land at: Martells Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU	Approved	Information unavailable	3	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Tendring Education Centre, Jaywick Lane, Clacton on Sea, Essex, CO16 8BE	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Tendring Education Centre, Jaywick Lane, Clacton on Sea, Essex, CO16 8BE	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture.
Land At Martells's Quarry, Slough Lane, Ardleigh, Essex CO7 7RU	Approved	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture.
Land At Martells's Quarry, Slough Lane, Ardleigh, Essex CO7 7RU	Approved	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture.
Crown Quarry (Ardleigh Reservoir Extension), Wick Farm, Old Ipswich Road, Tendring, Colchester, CO7 7QR	Approved	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture.
Elmstead Hall, Elmstead, Colchester, Essex	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						land use and agriculture.
Ardleigh Waste Transfer Station, A120, Ardleigh, Colchester, CO7 7SL	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture.
35 Roach Vale, Colchester, CO4 3YN	Approved	Information unavailable.	4	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture.
Boxted Bridge, Boxted, Essex, CO4 5TB	Report being prepared	Information unavailable	9	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Elmstead Hall, Elmstead, Colchester, Essex	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Lufkins Farm, Great Bentley Road, Frating CO7 7HN	EIA not required	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Lufkins Farm, Great Bentley Road, Frating CO7 7HN	Resolution made/ awaiting legal agreement	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Elmstead Hall, Elmstead, Colchester	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Elmstead Hall, Elmstead, Colchester, CO7 7EX	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Tendring District Council						
Land Between the A120 and A133, To The East of	Awaiting decision	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for NFOW so will

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Colchester and of Elmstead Market						not likely have a cumulative effect on land use and agriculture.
Hamilton Lodge Parsons Hill Great Bromley Colchester Essex CO7 7JB	Approval- outline	Information unavailable.	2	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.
Land adjacent to Lawford Grid Substation Ardleigh Road Little Bromley Essex CO11 2QB	Approved	Information unavailable.	0.3	N/A	No	The project is outside of the onshore project area for NFOW so will not likely have a cumulative effect on land use and agriculture.

22.8.3 Assessment of cumulative effects

211. The following projects have therefore been assessed for potential direct cumulative effects:
- Five Estuaries Offshore Wind Farm (herein ‘Five Estuaries’); and
 - East Anglia GREEN;
212. The Five Estuaries onshore search area will include a landfall, onshore cable corridor(s) and onshore substation. Although exact location details are not known at this stage, the Applicant is in regular and on-going dialogue with Five Estuaries Offshore Wind Farm Ltd. and has established that the location of the landfall, onshore cable corridor(s) and onshore substations will be broadly the same as North Falls and construction could occur at the same time and for a similar duration. Full details regarding the project design are not available at this stage.
213. A new onshore substation is proposed to be built as part of the East Anglia GREEN proposals by National Grid, close to the preferred location for the North Falls onshore substation. North Falls is planned for construction from 2026 at the earliest, compared to 2027 to 2031 for East Anglia Green. At the time of writing this PEIR, the latest publicly available information for East Anglia GREEN comprises a Scoping Report (National Grid, 2022).
214. Table 22.20 and Table 22.21 present the initial results of the CEA for the relevant projects. As the project(s) progress through detailed design and more information becomes available, the CEA will be updated and presented at the ES stage.

22.8.3.1 Construction

Table 22.20 Cumulative effects from other projects on land use and agriculture during construction

Project	Cumulative effect 1: Impacts on agricultural drainage	Cumulative effect 2: Impacts on land taken out of use	Cumulative effect 3: Impacts on soil (degradation and erosion)	Cumulative effect 4: Impacts on Agri-environment schemes
Five Estuaries Offshore Wind Farm	<p>The overlapping nature of both North Falls Offshore Wind Farm and Five Estuaries Offshore Wind Farm onshore project areas means that the Five Estuaries construction activities will very likely affect the same land uses and agricultural land parcels as described in Section 22.6.1.1.</p> <p>Therefore cumulative effects from both projects could occur to agricultural drainage.</p> <p>North Falls has committed to reinstating agricultural drainage following construction, which will be secured in the final CoCP and SMP (see Table 22.3). In light of this, it is not anticipated that cumulative effects are likely to be significant in EIA terms.</p>	<p>The overlapping nature of both North Falls Offshore Wind Farm and Five Estuaries Offshore Wind Farm onshore project areas means that the Five Estuaries construction activities will very likely affect the temporary loss of agricultural land as described in Section 22.6.1.2.</p> <p>Therefore cumulative effects from both projects could occur to temporary loss of agricultural land take.</p> <p>North Falls has committed to consultation with landowners regarding planning and timings of works as well as private agreements to be secured with the relevant landowners and occupiers (see Table 22.3). In light of this, it is not anticipated that cumulative effects are likely to be significant in EIA terms.</p>	<p>The overlapping nature of both North Falls Offshore Wind Farm and Five Estuaries Offshore Wind Farm onshore project areas means that the Five Estuaries construction activities will very likely affect the same soils as described in Sections 22.6.1.3 and 22.6.1.4.</p> <p>Therefore cumulative effects from both projects could occur to soils (degradation and erosion).</p> <p>North Falls has committed to embedded mitigation measures such as reducing the footprint of the works, limiting the exposure time and setting out the procedures for the appropriate handling of soils during construction works, which will be secured in the final CoCP and SMP (see Table 22.3). In light of this, it is not anticipated that cumulative effects are likely to be significant in EIA terms.</p>	<p>The overlapping nature of both North Falls Offshore Wind Farm and Five Estuaries Offshore Wind Farm onshore project areas means that the Five Estuaries construction activities will very likely affect the same agri-environment schemes at landfall as described in Section 22.6.2.</p> <p>Therefore cumulative effects from both projects could occur to agri-environment schemes.</p> <p>North Falls has committed to the avoidance of land parcels that are subject to agri-environment scheme agreements wherever possible. However, where impacts to land with an agri-environment agreement cannot be avoided, these will be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate (see Table 22.3). In light of this, it is not anticipated that cumulative effects are likely to be significant in EIA terms.</p>
East Anglia GREEN	<p>A new onshore substation is proposed to be built as part of the East Anglia GREEN proposals by National Grid. The East Anglia GREEN substation would be near the preferred location for the North Falls onshore substation.</p>	<p>A new onshore substation is proposed to be built as part of the East Anglia GREEN proposals by National Grid. The East Anglia GREEN substation would be near the preferred</p>	<p>A new onshore substation is proposed to be built as part of the East Anglia GREEN proposals by National Grid. The East Anglia GREEN substation would be near the preferred location for the North</p>	<p>A new onshore substation is proposed to be built as part of the East Anglia GREEN proposals by National Grid. The East Anglia GREEN substation would be near the preferred location for the North Falls onshore substation.</p>

Project	Cumulative effect 1: Impacts on agricultural drainage	Cumulative effect 2: Impacts on land taken out of use	Cumulative effect 3: Impacts on soil (degradation and erosion)	Cumulative effect 4: Impacts on Agri-environment schemes
	<p>However exact location details are not known at this stage.</p> <p>Construction activities for both projects will very likely affect the land uses and agricultural land parcels adjacent to those described in Section 22.6.1.1.</p> <p>Therefore cumulative effects from both projects could occur to agricultural drainage.</p> <p>North Falls has committed to reinstating agricultural drainage following construction, which will be secured in the final CoCP and SMP (see Table 22.3). In light of this, it is not anticipated that cumulative effects are likely to be significant in EIA terms.</p>	<p>location for the North Falls onshore substation. However exact location details are not known at this stage.</p> <p>Land taken out of use for East Anglia GREEN and the North Falls project, where the substations may be in close proximity to one another, is considered a permanent impact, or an impact for the duration of the project lifespan.</p> <p>Therefore cumulative effects from both projects could occur to land taken out of use.</p> <p>Operational cumulative effects of permanent change to land use are discussed further in Operation Table 22.21.</p>	<p>Falls onshore substation. However exact location details are not known at this stage.</p> <p>Construction activities for both projects will very likely affect soils parcels adjacent to those described in Sections 22.6.1.3 and 22.6.1.4.</p> <p>Therefore cumulative effects from both projects could occur to soils.</p> <p>North Falls has committed to embedded mitigation measures such as reducing the footprint of the works, limiting the exposure time and setting out the procedures for the appropriate handling of soils during construction works, which will be secured in the final CoCP and SMP (see Table 22.3). In light of this, it is not anticipated that cumulative effects are likely to be significant in EIA terms.</p>	<p>However exact location details are not known at this stage.</p> <p>Construction activities for East Anglia GREEN has the potential to affect nearby agri-environment schemes to those affected by North Falls.</p> <p>Therefore cumulative effects from both projects are could occur to agri-environment schemes.</p> <p>North Falls has committed to the avoidance of land parcels that are subject to agri-environment scheme agreements wherever possible. However, where impacts to land with an agri-environment agreement cannot be avoided, these will be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate (see Table 22.3).</p> <p>In light of this, it is not anticipated that cumulative effects are likely to be significant in EIA terms.</p>

22.8.3.3 Operation

Table 22.21 Cumulative effects from other projects on land use and agriculture during operation

Project	Cumulative effect 1: Permanent change to land use	Cumulative effect 2: Impacts on agri-environment schemes
Five Estuaries Offshore Wind Farm	<p>The overlapping nature of both North Falls Offshore Wind Farm and Five Estuaries Offshore Wind Farm onshore project areas means that the Five Estuaries operational activities will very likely affect the same permanent loss of agricultural land as described in Section 22.6.3.2.</p> <p>Therefore cumulative effects from both projects could occur to permanent loss of agricultural land take. As effects alone are significant in EIA terms prior to further project design refinement prior to DCO submission, it is anticipated that cumulative effects therefore are likely to also be significant in EIA terms.</p>	<p>The overlapping nature of both North Falls Offshore Wind Farm and Five Estuaries Offshore Wind Farm onshore project areas means that the Five Estuaries operational activities will very likely affect the same agri-environment schemes at landfall as described in Section 22.6.3.3.</p> <p>Therefore cumulative effects from both projects could occur to agri-environment schemes during operation.</p> <p>North Falls has committed to the avoidance of land parcels that are subject to agri-environment scheme agreements, where possible. However, where impacts to land with an agri-environment agreement cannot be avoided, these will be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate (see Table 22.3). In light of this, it is not anticipated that cumulative effects are likely to be significant in EIA terms.</p>
East Anglia GREEN	<p>A new onshore substation is proposed to be built as part of the East Anglia GREEN proposals by National Grid. The East Anglia GREEN substation would be near the preferred location for the North Falls onshore substation. However exact location details are not known at this stage.</p> <p>Operational activities for both projects will very likely affect the same permanent loss of agricultural land as described in Section 22.6.3.2.</p> <p>Therefore cumulative effects from both projects could occur to permanent loss of agricultural land take. As effects alone are significant in EIA terms prior to further project design refinement prior to DCO submission, it is anticipated that cumulative effects therefore are likely to also be significant in EIA terms.</p>	<p>A new onshore substation is proposed to be built as part of the East Anglia GREEN proposals by National Grid. The East Anglia GREEN substation would be near the preferred location for the North Falls onshore substation. However exact location details are not known at this stage.</p> <p>Operational activities for both projects are unlikely to affect the same agri-environment schemes as described in Section 22.6.3.3.</p> <p>Therefore cumulative effects from both projects are unlikely to occur to agri-environment schemes during operation.</p>

22.8.3.4 Decommissioning

215. Decommissioning of Five Estuaries may potentially take place at the same time as the North Falls project. The detail and scope of the decommissioning works from the North Falls project will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator.
216. A decommissioning plan will be provided. As such, cumulative effects during the decommissioning phase are assumed to be the same as those identified during the construction phase.

22.9 Transboundary effects

217. Given that there will not be a significant effect on land use and agriculture, transboundary impacts are unlikely to occur and therefore transboundary impacts are scoped out of further assessment in accordance with the Scoping Opinion (Planning Inspectorate, 2021).

22.10 Interactions

218. Onshore chapters tend to be topic based and the same receptor may be assessed in multiple chapters, e.g. a residential property may be assessed separately for noise, air quality, traffic and visual impacts. There is the potential for these separate impacts to interact, spatially and temporally, to create interactions on a receptor. Where there are impacts to the same receptors across chapters these should be indicated in Table 22.22.

Table 22.22 Land use and agriculture interactions

Topic and description	Related chapter (Volume I)	Where addressed in this chapter	Rationale
Construction			
Soil degradation and loss of soil to erosion	Chapter 19 Ground Conditions and Contamination	Sections 22.6.1.3 and 22.6.1.4.	Changes in soil quality could affect ground conditions and potential contaminated land.
	Chapter 23 Onshore Ecology	Sections 22.6.1.3 and 22.6.1.4.	Changes to land uses could affect ecological receptors for example the removal of trees or hedgerows or the loss of agricultural land.
	Chapter 25 Onshore Archaeology and Cultural Heritage	Sections 22.6.1.3 and 22.6.1.4.	Potential effects on soils could affect any buried archaeology present.
Agricultural drainage	Chapter 21 Water Resources and Flood Risk	Section 22.6.1.1	Potential effects on drainage could lead to changes in flood risk or water resources e.g. private water supplies
Temporary loss of land for agriculture	Chapter 23 Onshore Ecology	Section 22.6.1.2.	Changes to land uses could impact on ecological receptors for example the removal of trees or hedgerows or the loss of agricultural land.

Topic and description	Related chapter (Volume I)	Where addressed in this chapter	Rationale
	Chapter 30 Landscape and Visual Impact Assessment	Section 22.6.1.2.	Changes to land uses could impact on the landscape and visual amenity.
Impacts on agri-environment schemes and utilities	Chapter 25 Onshore Archaeology and Cultural Heritage	Sections 22.6.2 and 22.6.2.2.	Potential effects on land use could affect any buried archaeology present.
Operation			
Agricultural drainage	Chapter 21 Water Resources and Flood Risk	Section 22.6.3.1.	Potential impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies.
Permanent loss of land for agriculture	Chapter 30 Landscape and Visual Impact Assessment	Section 22.6.3.2.	Changes to land uses could impact on the landscape and visual amenity.
	Chapter 31 Socio-Economics	Section 22.6.3.2.	Changes in the agricultural industry may affect the socio-economics of the region.
Decommissioning			
Impacts associated with the decommissioning phase are currently unknown but would be no greater than those identified for the construction phase.			

22.11 Inter-relationships

219. The impacts identified and assessed in this chapter have the potential to interrelate with each other. The areas of potential inter-relationships between impacts are presented in Table 22.23. This provides a screening tool for which impacts have the potential to interrelate. Table 22.24 provides an assessment for each receptor (or receptor group) as related to these impacts.
220. Within Table 22.24 the impacts are assessed relative to each development phase (i.e. construction, operation or decommissioning) to see if (for example) multiple construction impacts affecting the same receptor could increase the significance of effect upon that receptor. Following this, a lifetime assessment is undertaken which considers the potential for impacts to affect receptors across all development phases.

Table 22.23 Inter-relationships between impacts - screening

Potential interaction between impacts						
Construction						
	Drainage	Land taken out of existing use	Degradation of soil	Soil erosion	Agri-environment schemes	Utilities
Drainage	-	Yes	Yes	Yes	No	No
Land taken out of existing use	Yes	-	Yes	Yes	Yes	Yes
Degradation of soil	Yes	Yes	-	Yes	Yes	No
Soil erosion	Yes	Yes	Yes	-	Yes	No
Agri-environment schemes	No	Yes	Yes	Yes	-	No
Utilities	No	Yes	No	No	No	-

Table 22.24 Inter-relationship between impacts – phase and lifetime assessment

Receptor	Highest significance level			Phase assessment	Lifetime assessment
	Construction	Operation	Decommissioning		
Agricultural drainage	Minor adverse	Negligible adverse	TBC	<p>No greater than individually assessed impact.</p> <p>Construction activities are considered to have a low magnitude of impact on agricultural drainage, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and best practice methodologies.</p> <p>Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impact than assessed individually.</p>	<p>No greater than individually assessed impact.</p> <p>Agricultural drainage could be affected during the construction and operational phases of North Falls.</p> <p>Land drainage would be reinstated following construction. There is a negligible significance of effect to agricultural drainage anticipated during the lifetime of the onshore substation. It is therefore anticipated that there are no lifetime significant effects for agricultural drainage.</p>
Loss of agricultural land	Minor adverse	Moderate adverse	TBC	<p>No greater than individually assessed impact.</p> <p>Construction activities are considered to have a low magnitude of impact on the temporary loss of agricultural land, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and best practice methodologies.</p> <p>Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impact than assessed individually.</p>	<p>No greater than individually assessed impact.</p> <p>Agricultural land will be affected during the construction and operational phases of North Falls.</p> <p>Temporary agricultural land take during construction will be reinstated to pre-construction condition and North Falls has committed to seek private agreements (or compensation in line with the compulsory purchase compensation code) with relevant landowners/occupiers.</p> <p>It is therefore anticipated that there are no lifetime significant effects for temporary and permanent loss of agricultural land.</p>
Degradation of soil	Minor adverse	N/A	TBC	<p>No greater than individually assessed impact.</p>	<p>No greater than individually assessed impact.</p>

Receptor	Highest significance level			Phase assessment	Lifetime assessment
	Construction	Operation	Decommissioning		
				<p>Construction activities are considered to have a low magnitude of impact on soil degradation, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and best practice methodologies.</p> <p>Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impacts than are assessed individually.</p>	<p>Degradation of soil may occur during the construction phase of North Falls. Soils will be reinstated following construction to their original condition. It is therefore anticipated that there are no lifetime significant effects for soils.</p>
Soil erosion	Negligible adverse	N/A	TBC	<p>No greater than individually assessed impact.</p> <p>Construction activities are considered to have a medium magnitude of impact on soil erosion, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and best practice methodologies.</p> <p>Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impacts than are assessed individually.</p>	<p>No greater than individually assessed impact.</p> <p>Soil erosion may occur during the construction phase of North Falls. Soils will be reinstated following construction to their original condition. It is therefore anticipated that there are no lifetime significant effects for soils.</p>
Agri-environment schemes	Minor adverse	Negligible adverse	TBC	<p>No greater than individually assessed impact.</p> <p>Construction activities are considered to have a medium magnitude of impact on agri-environment schemes, with significance of effect dependent upon the sensitivity of the receptor.</p>	<p>No greater than individually assessed impact.</p> <p>Agri-environment schemes will be affected during the construction and operational phases of North Falls.</p>

Receptor	Highest significance level			Phase assessment	Lifetime assessment
	Construction	Operation	Decommissioning		
				<p>Each impact would be managed with standard and best practice methodologies.</p> <p>Therefore, it is considered that there would either be no interactions between the phases, or that these would not result in greater impacts than are assessed individually.</p>	<p>North Falls has committed to the avoidance of land parcels that are subject to agri-environment scheme agreements, wherever possible. However, where impacts to land with an agri-environment agreement cannot be avoided, these will be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate (see Table 22.3).</p> <p>It is therefore anticipated that there are no lifetime significant effects for agri-environment schemes.</p>
Utilities	Negligible adverse	No change	TBC	<p>No greater than individually assessed impact.</p> <p>Construction activities are considered to have a low magnitude of impact on utilities, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed through protective provisions as set out in the DCO and/or side agreements.</p> <p>Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impact than assessed individually.</p>	<p>No greater than individually assessed impact.</p> <p>Utilities will be affected during the construction phases of North Falls.</p> <p>Protective provisions and/or side agreements will be agreed with affected utilities as part of the DCO application process. North Falls will undertake utility crossings or diversions in accordance with the appropriate industry standards for such crossings.</p> <p>It is therefore anticipated that there are no lifetime significant effects for utilities.</p>
Soil heating	N/A	No impact	TBC	<p>No greater than individually assessed impact.</p> <p>Construction activities will have no impact on soil heating.</p>	<p>No greater than individually assessed impact.</p> <p>Soil heating effects will not occur during the operational phase of North Falls.</p>

Receptor	Highest significance level			Phase assessment	Lifetime assessment
	Construction	Operation	Decommissioning		
				Therefore it is considered that there would either be no interactions between the phases.	It is therefore anticipated that there are no lifetime significant effects for soil heating.

22.12 Summary

221. This chapter has provided the characterisation of the existing environment for land use and agriculture based on existing survey data. This is outlined in Table 22.25 below.
222. The EIA has established that land use and agriculture receptors could be affected as a result of direct and indirect impacts during the construction, operation and decommissioning phases. The residual effects on the majority of receptors during these phases would be negligible adverse or minor adverse.
223. Where there are multiple possible outcomes depending on, for example, whether construction works would involve trenchless or open-trench installation in a relevant area, the worst-case scenario (which involves the greater magnitude of impact) is listed in Table 22.25, below.

Table 22.25 Summary of potential likely significant effects on land use and agriculture

Potential impact	Receptor	Sensitivity	Magnitude of impact	Pre-mitigation effect (including embedded mitigation)	Additional Mitigation measures proposed	Residual effect
Construction						
Impact 1: Potential for earthworks associated with construction to impact natural and artificial field drainage systems	Agricultural drainage receptors within the onshore project area	Medium	Low	Minor adverse	N/A	N/A
Impact 2: Temporary loss of agricultural land during construction	Agricultural land within the onshore project area	Medium	Low	Minor adverse	N/A	N/A
Impact 3: Potential for soils to become compacted and for soil structure to deteriorate during construction works	Soils within the onshore project area	Medium	Low	Minor adverse	N/A	N/A
Impact 4: Excavation, storage and reinstatement during construction exposes the soils and potentially leads to soil erosion	Soils within the onshore project area	Low	Medium	Minor adverse	N/A	N/A
Impact 5: During construction there would be potential ecological and financial impacts on agri-environment schemes	Agri-environment schemes within the onshore project area	Medium	Low	Minor adverse	N/A	N/A
Impact 6: During construction there would be potential impacts on existing utilities	Utilities crossing the onshore project area	Low	Low	Negligible adverse	N/A	N/A
Operation						
Impact 7: Permanent above ground infrastructure at the	Agricultural drainage within	Low	Low	Negligible adverse	N/A	N/A

Potential impact	Receptor	Sensitivity	Magnitude of impact	Pre-mitigation effect (including embedded mitigation)	Additional Mitigation measures proposed	Residual effect
onshore substation as well as presence of buried cables has the potential to affect field / land drainage during operation	the onshore project area					
Impact 8: Permanent Loss of agricultural land during operation due to installation of up to 196 link boxes	Agricultural land within the onshore project area	High	Low	Moderate adverse	No additional mitigation measures proposed	Moderate adverse
Impact 9: Transmission of electricity resulting in small energy losses in the form of heat dissipation	Soils within the onshore project area	Low	No impact	No impact	N/A	N/A
Impact 10: Loss of land under agri-environment schemes due to permanent infrastructure associated with the onshore substation and link boxes.	Agri-environment schemes within the onshore project area, notably the onshore substation zone	High	Negligible	Minor adverse	N/A	N/A
Impact 11: Potential for maintenance activities to affect utilities, since maintenance may require access to buried cables	Utilities within the onshore project area	Negligible	Negligible	Negligible adverse	N/A	N/A
Decommissioning						
It is anticipated that the decommissioning impacts will be no worse than those for construction.						

22.13 References

<p>Cranfield University (2020) Cranfield Soil and Agrifood Institute: Soilscales. Available at: http://www.landis.org.uk/soilscales/</p>
<p>Department for Business, Energy and Industrial Strategy (2021a) Draft Overarching NPS for Energy (EN-1)</p> <p>Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015233/en-1-draft-for-consultation.pdf</p>
<p>Department for Business, Energy and Industrial Strategy (2021b) Draft NPS for Renewable Energy Infrastructure (EN-3)</p> <p>Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/243576/9780108508516.pdf</p>
<p>Department for Business, Energy and Industrial Strategy (2021c) Draft NPS for Electricity Networks Infrastructure (EN-5)</p> <p>Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47788/1934-aos-main-report-en5.pdf#:~:text=National%20Policy%20Statement%20for%20Electricity%20Networks%20Infrastructure%20%28EN-5%29.,is%20one%20of%20five%20energy%20NPSs%20covering%20specific</p>
<p>Department of Energy and Climate Change (2011a) Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf</p>
<p>Department of Energy and Climate Change (2011b) NPS for Renewable Energy Infrastructure (EN-3)</p> <p>Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47856/1940-nps-renewable-energy-en3.pdf</p>
<p>Department of Energy and Climate Change (2011c) NPS for Electricity Networks Infrastructure (EN-5)</p> <p>Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/37050/1942-national-policy-statement-electricity-networks.pdf</p>
<p>Department for Environment, Food and Rural Affairs (2011) Natural Environment White Paper 2011. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/366526/newp-imp-update-oct-2014.pdf</p>
<p>Department for Environment, Food and Rural Affairs (2019) Structure of the agricultural industry in England and the UK at June 2019.</p>

<p>Department for Environment, Food and Rural Affairs (2021) Statistical data set, Structure of the agricultural industry in England and the UK at June. Available at: https://www.gov.uk/government/statistical-data-sets/agriculture-in-the-united-kingdom</p>
<p>Essex County Council (2014) Essex Minerals Local Plan 2014. Available at: https://assets.ctfassets.net/knkzaf64jx5x/5UZuVtnjZbJ81olvZoZKvX/90acfc65df6fa8ee8ab20df3f0cda1c8/essex-minerals-local-plan-adopted-july-2014.pdf</p>
<p>Essex County Council (2022) Essex Coastal Forum. Available at: https://www.coastalessex.org/the-essex-coast/coastal-economy/agriculture/#:~:text=Farming%20is%20a%20major%20part,the%20upstream%20and%20downstream%20industries.</p>
<p>Essex Green Infrastructure Strategy (2020). Available at: www.placeservices.co.uk/media/325343/essex-gi-strategy-accessible-pdf.pdf</p>
<p>Essex Place Services (2017) Land use and landscape data. Available at: https://www.placeservices.co.uk/resources/built-environment/essex-gi-strategy/</p>
<p>European Commission (Joint Research Centre) (2008). European Soil Portal – Soil Data and Information Systems: Soil Compaction.</p>
<p>Green Essex (2019) Appendices: A strategy that advocates for high quality green space and green infrastructure in Essex 2019. Available at: https://consultations.essex.gov.uk/rci/green-essex-strategy/supporting_documents/GE_Appendices_24042019_2%202.pdf</p>
<p>HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf</p>
<p>Intergovernmental Panel on Climate Change (IPCC) (2019) Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.-O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press.</p>
<p>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)</p>
<p>Ostle et al. (2009) N.J. Ostle, P.E. Levy, C.D. Evans, P. Smith, UK land use and soil carbon sequestration, Land Use Policy, Volume 26, Supplement 1, 2009, Pages S274-S283, ISSN 0264-8377, https://doi.org/10.1016/j.landusepol.2009.08.006</p>
<p>Planning Inspectorate (2018) Advice Note Nine: Rochdale Envelope. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/</p>

Planning Inspectorate (2021) Advice Note Twelve: Transboundary Impacts and Process. Available at: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-twelve-transboundary-impacts-and-process/>

Royal HaskoningDHV (2022) North Falls Offshore Wind Farm: Extended Phase 1 Habitat Survey for 2021/2022.

Szewczyk, W., Feyen . L., Ciscar , J.C., Matei 0.2-1.0-1.7 , A., Mulholland, E., Soria, A. (2020) Economic analysis of selected climate impacts. JRC PESETA IV project 10 Task 14

Tendring District Council (2021) Tendring District Local Plan 2013 – 2033 and Beyond Section 1 2021. North Essex Authorities' Shared Strategic Section 1 Plan. Available at: <https://www.tendringdc.gov.uk/localplan>

Tendring District Council (2022) Tendring District Local Plan 2013 – 2033 and Beyond Section 2022. Available at: https://www.tendringdc.gov.uk/sites/default/files/documents/planning/Planning_Policy/Section_2/Tendring%20District%20Local%20Plan%202013-2033%20and%20Beyond%20-%20Section%202_AC.pdf