NORTH FALLS

Offshore Wind Farm

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

Chapter 18 Infrastructure and Other Users

Document Reference No: 004334944-04
Date: May 2023
Revision: 04

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May 2023

Project	North Falls Offshore Wind Farm
Sub-Project or Package	N/A
Document Title	Preliminary Environmental Information Report Chapter 18 Infrastructure and Other Users
Document Reference	004334944-04
Revision	04 (Draft A)
Supplier Reference No	PB9244-RHD-PE-OF-RP-OF-0060

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
00 (Draft A)	05/07/22	1st draft for NFOW review	CB/BH	GK	-
01 (Draft B)	18/09/22	1st draft for NFOW review	CB/BH	GK	-
02 (Draft C)	07/10/22	2nd draft for NFOW review	BH	GK	-
03 (Draft D)	30/03/23	3rd draft for NFOW review	MJW	GK	-
04 (Draft A)	19/04/23	Final	MJW	GK	JP / DH / AP

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Glossary of Acronyms

AfL	Agreement for Lease
BEIS	Department for Business, Energy and Industrial Strategy
CEA	Cumulative Effect Assessment
DCO	Development Consent Order
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESCA	European Subsea Cable UK Association
GGOW	Greater Gabbard Offshore Wind Farm
GWF	Galloper Wind Farm
ICPC	The International Cable Protection Committee
MCZ	Marine Conservation Zone
MoD	Ministry of Defence
NFOW	North Falls Offshore Wind Farm Limited
NRA	Navigational Risk Assessment
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OGA	Oil and Gas Authority
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Information Report
PEXA	Practice and Exercise Area
UK	United Kingdom
UXO	Unexploded Ordinance
WTG	Wind Turbine Generator
ZoI	Zone of Influence

Glossary of Terminology

Array areas	The two distinct offshore wind farm areas (including the 'northern array area' and 'southern array area') which together comprise the North Falls offshore wind farm.
Array cables	Cables which link the wind turbine generators with each other and the offshore substation platform(s).
The Project or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
The Applicant	North Falls Offshore Wind Farm Limited (NFOW).
Interconnector cable	Cable between the northern and southern array areas
Interconnector cable corridor	The corridor of the seabed between the northern and southern array areas
Landfall	The location where the offshore cables come ashore.
Offshore cable corridor	The corridor of seabed from array areas to the landfall within which the offshore export cables will be located.
Offshore export cables	The cables which bring electricity from the array areas to the landfall.
Offshore project area	The overall area of the array areas and the offshore cable corridor.
Offshore substation platform(s)	Fixed structure(s) located within the array areas, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable voltage for export to shore via offshore export cables.
Safety zones	A marine zone outlined for the purposes of safety around a possibly hazardous installation or works / construction area
Scour protection	Protective materials to avoid sediment being eroded away from the base of the wind turbine generator foundations and offshore substation platform foundations as a result of the flow of water.
Search and Rescue (SAR)	The search and provision of aid to people who are in distress or imminent danger.
Wind turbine generator (WTG)	Power generating device that is driven by the kinetic energy of the wind

18 Infrastructure and Other Users

18.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) considers the likely significant effects of the North Falls offshore wind farm (hereafter “North Falls” or “the Project”) on infrastructure and other users. The chapter provides an overview of the existing environment for the offshore project area, followed by an assessment of the likely significant effects for the construction, operation, maintenance 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 source is the National Policy Statements (NPS). Details of these and the methodology used for the Environmental Impact Assessment (EIA) and Cumulative Effect Assessment (CEA) are presented in Section 18.4.

3. The assessment should be read in conjunction with following linked chapters (Volume I):

   - Chapter 14 Commercial fisheries;
   - Chapter 15 Shipping and navigation; and
   - Chapter 17 Aviation and radar.

18.2 Consultation

4. Consultation with regard to infrastructure and other users 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 ongoing consultation with owners and operators of assets in proximity to North Falls. The feedback received has been considered in preparing the PEIR. Table 18.1 provides a summary of how the consultation responses received to date have influenced the approach that has been taken.

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

Table 18.1 Consultation responses

Consultee	Document / Date	Comment	Response / where addressed in the PEIR
Natural England	Scoping Opinion 16/08/2021	Overlapping subsea cables in the southern array area could lead to the placing of cable crossings/protection within the Kentish Knock East Marine Conservation Zone (MCZ), which partially overlaps with the southern array. The potential impact of cable crossings/protection in the Kentish Knock MCZ will need to be assessed.	This is addressed in the Marine Conservation Zone (MCZ) assessment submitted alongside this PEIR.

Consultee	Document / Date	Comment	Response / where addressed in the PEIR
Natural England	Scoping Opinion 16/08/2021	North Falls array areas and export cable corridor overlap closed disposal sites. The interconnector cable overlaps the Inner Gabbard East disposal site. Construction (and decommissioning) activities could potentially release contaminated sediment or sediment that is not the same as the surrounding seabed during construction. Offshore surveys should be considered for the North Falls OWF site and offshore export cable corridor to determine if any contaminants from previous disposal activities are present.	Impacts associated with the potential release of contaminated sediment are addressed in Chapter 9 Marine Water and Sediment Quality (Volume I).
Natural England	Scoping Opinion 16/08/2021	Mineral aggregate extraction areas adjacent to/overlapping the array(s) and/or export cable corridor. Further consideration of the cumulative effects of North Falls construction and aggregate extraction activities on the release of suspended sediments into the water column, sediment transport processes and nearby designated sites (e.g., Kentish Knock East MCZ) should be presented in the ES.	This is assessed in Chapter 8 Marine Geology, Oceanography and Physical Processes (Volume I).
The Planning Inspectorate	Scoping Opinion 26/08/2021	Potential cumulative impacts during all phases. The Inspectorate does not agree that this matter can be scoped out as insufficient justification has been provided to support the approach, including an absence of detail of proposed mitigation measures referred to in the Scoping Report (i.e. development of crossing agreement or similar) and the Inspectorate considers that there is potential for likely significant cumulative effects with other planned wind farm developments, including the extension to [Galloper Offshore Wind Farm] GOWF, East Anglia ONE North and East Anglia TWO.	The cumulative effects with other planned OWF are addressed in Section 18.7.
The Planning Inspectorate	Scoping Opinion 26/08/2021	The Inspectorate notes that there are no oil and gas pipelines or platforms in proximity to the scoping boundary, and no oil and gas licensed blocks overlap the scoping boundary. It is unclear from Section 2.13 as to whether impacts to these users are scoped into the ES. The Inspectorate considers that this matter can be scoped out of the ES on the basis that there is no oil or gas infrastructure within the scoping boundary and therefore no significant effects are likely to occur.	North Falls Offshore Wind Farm Ltd (NFOW) agrees that oil and gas users are scoped out of the assessment.
The Planning Inspectorate	Scoping Opinion 26/08/2021	The Inspectorate notes that there is potential for wartime unexploded ordinance (UXO) to be located in the southern North Sea, but in this section of the Scoping Report it is stated that it is not proposed to ascertain the locations and develop any mitigation until after any DCO is granted.	A UXO survey will be undertaken post-consent once the Project layout is known. This approach is in keeping with other consented OWFs.. The UXO clearance would be subject to additional licencing.

Consultee	Document / Date	Comment	Response / where addressed in the PEIR
		The Inspectorate considers that there is potential for UXO to give rise to significant effects if they are present within the scoping boundary, e.g., in relation to clearance activities there could be impact to offshore archaeology (see Section 2.11.3.1) and marine mammal ecology (Section 2.7.3.1). The ES should be supported by survey information to identify the potential location of UXO within the DCO boundary and an outline mitigation plan, in order to support an assessment of the worst case scenario associated with UXO clearance.	An estimate of number of clearance operations is provided in Section 5.5.4.1.2 of Chapter 5 Project Description (Volume I) and is included in the worst case scenario for assessment (Section 18.3.2)
The Planning Inspectorate	Scoping Opinion 26/08/2021	The Inspectorate notes that the offshore export cable corridor forming part of the Proposed Development has been provisionally located to minimise overlap with the planned dredging area for Harwich Approach Channel. It is unclear from Section 2.13 as to whether impacts to these users are scoped into the ES. The Inspectorate considers that where there is potential for likely significant effects to occur, this matter should be scoped into the ES. If it is a planning development, it should form part of the assessment of cumulative effects. The location of the planned dredging area should be shown on a figure within the ES.	Section 18.5.4 details that the offshore project area does not overlap with Harwich Approach Channel dredging area and is shown in Figure 18.2 (Volume II). Assessment of impacts on shipping and navigation is provided in Chapter 15 (Volume I).
The Planning Inspectorate	Scoping Opinion 26/08/2021	The Inspectorate notes that there is potential for cables and cable crossing/ protection to be located in the Kentish Knock East MCZ; the MCZ should be scoped into the ES as a receptor.	The impact of cable protection on the Kentish Knock East MCZ is addressed in the MCZ assessment included within this PEIR.
The Planning Inspectorate	Scoping Opinion 26/08/2021	The Scoping Report states that the “EIA will be based on existing data and information gathered through consultation”. A study area is not defined, and no information is presented about the methodology that will be used to assess impacts, nor is any criteria presented to identify how significance of effect will be determined. The ES should be clear on how the assessment has been undertaken, taking into account relevant guidance and using an aspect specific methodology where possible.	The study area and methodology are described in Sections 18.3.1 and 18.4, respectively.
Defence Infrastructure Organisation (DIO)	Scoping Opinion 16/08/2021	The scoping report notes, at Section 2.13, that the project area falls within, passes through, or is close to, parts of five Practice and Exercise Areas (PEXAs), Kentish Knock (X5119), North Galloper (X5121), Outer Gabbard (X5117), South Galloper (X5120), and Gunfleet (X5118). Following an initial assessment of the scheme, we do not anticipate there to be any concerns relating to military maritime activities however, the MOD will review detailed submissions in relation to its maritime interests. Within the same section of the report the potential presence of unexploded ordnance	PEXAs and disposal areas are discussed in Section 18.5.6. An estimate of number of clearance operations is provided in Section 5.5.4.1.2 of Chapter 5 Project Description (Volume I) and is included in the worst case scenario for assessment (Section 18.3.2) The disused UXO dumping ground in the eastern part of Gunfleet PEXA X5118 has

Consultee	Document / Date	Comment	Response / where addressed in the PEIR
		(UXO) is identified as a relevant consideration. The potential presence of UXO and disposal sites should also be a relevant consideration to the installation of cables and other intrusive works that may be undertaken in the maritime environment. The developer should note that there is a disused, designated explosives dumping ground within the eastern part of the Gunfleet PEXA (X5118), this should be considered when cable routes are being designed.	been avoided through the route selection of the offshore cable corridor, discussed further in Chapter 4 (Volume I).
Cemex	Meeting 28/09/2021	The closest Cemex licence area is Shipwash 507/6 which is approximately 200m from the North Falls northern array boundary. The closest boundary is measured from the southern edge of Area 507/6. 507/6 is relatively small site, and experiences fast tides, so the dredgers need additional space to turn beyond the confines of the dredge area so they can fully dredge from the south to north boundaries, or vice versa depending on the tidal direction. With the wind farm to the south this would effectively sterilise part of the southern section of 507/6 as in a flood (i.e., southbound) tide the vessel would be lining up to start their dredge run from the south in order to stem the tide. It would be ok in an ebb tide as they dredge up to the boundary then turn away. Adjacency is also less of an issue along the eastern boundary of the dredge area which the planned NFOW northern array boundary runs parallel to (north-south) due to the direction of dredging. Cemex have experience of working in proximity to other wind farms, e.g., in the Humber and South coast, but never as close as 507/6 to North Falls. If a ship lost power and drifted towards the wind farm, there could be interaction with subsea cables if they are unable to bring the drag-head up quickly.	Consultation with Cemex is ongoing and they will be included in a hazard workshop to inform the Navigational Risk Assessment (NRA), post-PEIR (see Chapter 15 Shipping and Navigation (Volume I)

18.3 Scope

18.3.1 Study area

6. Direct overlap of activities is limited to the offshore project area (encompassing all Project infrastructure). The study area is then extended to 50km using expert judgement of the zone of influence (ZoI) for indirect effects and allows for potential interaction with a wide range of other users, both offshore and onshore.

7. The assessment considers existing as well as planned projects and activities, where information is within the planning system, otherwise publicly available, or has been made available through the consultation process.

18.3.2 Realistic worst-case scenario

8. The final design of the Project 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).

9. The realistic worst-case scenarios for the likely significant effects scoped into the EIA for the infrastructure and other users assessment are summarised in Table 18.2. These are based on the project parameters described in Chapter 5 Project Description (Volume I), which provides further details regarding specific activities and their durations.

Table 18.2 Realistic worst case scenarios

Potential impact	Parameter	Notes
Construction		
Impact 1: Potential interference with other wind farms Impact 2: Physical Impacts on subsea cables Impact 3: Impacts on disposal sites Impact 4: Impacts on dredging Impact 5: Impacts on MoD activities	Maximum North Falls offshore infrastructure: • 72 wind turbines; • 2 offshore electrical platforms, • 228km of array cable with up to 20% of the cable length requiring surface laid cable protection; • 250.8km of export cable with up to 10% of the cable length requiring surface laid cable protection. Safety zones around potentially hazardous installation or works / construction area will be identified as required by the shipping and navigation assessment (Chapter 15, Volume I). An estimated 15 clearance operations are predicted during preparation for construction (12 in the array areas and 3 in the offshore cable corridor). Offshore construction duration: 3 years Maximum vessels on site: 35 Maximum vessel movements: 3,090 over three year offshore construction period (average of 1,030 movements per year, 3 movements per day)	The worst case is based on the project envelope options that would result in the installation of the greatest amount of project infrastructure interacting with other infrastructure and users.
Operation		
Impact 1: Potential interference with other wind farms Impact 2: Physical Impacts on subsea cables	Maximum North Falls offshore infrastructure: • 72 wind turbines; • 2 offshore electrical platforms, • 45.6km of array cable protection; • 25km of export cable protection.	The worst case is based on the project envelope options that would result in the installation of the greatest amount of project infrastructure interacting with other infrastructure and users.

Potential impact	Parameter	Notes
Impact 3: Impacts on disposal sites Impact 4: Impacts on dredging Impact 5: Impacts on MoD activities	Safety zones around potentially hazardous installation or works / construction area will be identified as required by the shipping and navigation assessment (Chapter 15, Volume I). Indicative design life: 30 years Indicative peak vessel movements per year: 1,587	
Decommissioning		

Impact 1: Potential interference with other wind farms
Impact 2: Physical impacts on subsea cables
Impact 3: Impacts on disposal sites
Impact 4: Impacts on dredging
Impact 5: Impacts on MoD activities
	<u>Foundations</u>
	Cutting of piles below the seabed surface:
	• 300 pin-piles of 3.5m diameter
	  ○ 72 wind turbines x 4 piles
	  ○ 2 OSPs x 6 piles
	Or
	• 74 monopiles of 17m diameter (72 wind turbines + 2 OSPs)
	
	Or
	Removal of largest foundations (GBS):
	• 72 wind turbines x 65m diameter
	• 2 OSPs x 60m diameter
	
	<u>Export cables</u>
	Up to 250.8km of export cable (removal to be determined in consultation with key stakeholders as part of the decommissioning plan)
	
	<u>Array cables</u>
		The worst case scenario in terms of interactions with infrastructure and other users during the decommissioning phase is based on the project envelope options that would result in the greatest amount of activity during the phase.
		The impact of leaving infrastructure in situ would be considered as part of determining the decommissioning strategy. Should certain infrastructure be left in situ, the impacts would be comparable to the operational phase.

Potential impact	Parameter	Notes
	Up to 228km of array/interconnector cable (removal to be determined in consultation with key stakeholders as part of the decommissioning plan) The following infrastructure is likely to be decommissioned *in situ* depending on available information at the time of decommissioning: • Scour protection; and • Cable protection.	

18.3.3 Summary of mitigation embedded in the design

10. The location of the offshore project area has been selected to minimise potential interactions with neighbouring infrastructure. This is the key embedded mitigation with regard to infrastructure and other users. Chapter 4 Site Selection and Assessment of Alternatives (Volume I) describes the key site selection principles, including avoidance or minimisation of overlap with the following existing, closed or proposed infrastructure:

    - Disposal sites;
    - Dredging areas;
    - Pipelines
    - Cables

11. Further mitigation is outlined in Table 18.3.

Table 18.3 Embedded mitigation measures

Parameter	Mitigation measures embedded into North Falls design
Stakeholder engagement	Owners and operators of infrastructure (other wind farm developers, dredging companies and cable operators) have been and will continue to be, consulted by the Applicant, and commercial and technical agreements will be put in place where required ahead of construction.
Promulgation of information	Advance warning and accurate location details of construction, maintenance and decommissioning operations, associated safety zones and advisory passing distances will be given via Notices to Mariners and Kingfisher Bulletins and other appropriate media. This will be secured through the DCO / Deemed Marine Licence (DML) conditions. Relevant shipping and navigation mitigations are described in Chapter 15 Shipping and Navigation (Volume I).
Crossing and proximity agreements	Crossing and proximity agreements will be agreed post-consent with the relevant asset owners, where required.
Marking and lighting	Consultation with Trinity House to determine appropriate lighting and marking.
Unimpeded Search and Rescue (SAR) access	Alignment of turbines as required under Marine Guidance Note (MGN) 654 to provide obstruction free SAR access.

18.4 Assessment methodology

18.4.1 Legislation, guidance and policy

18.4.1.1 National Policy Statements

12. The assessment of likely significant effects upon infrastructure and other users has been made with specific reference to the relevant NPS. These are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIPs). The NPS for Renewable Energy Infrastructure (EN-3) (DECC, 2011) is of most relevance to infrastructure and other users.

13. The NPS for Renewable Energy Infrastructure (EN-3) is in the process of being revised. Draft versions were published for consultation in September 2021 by Department for Business Energy and Industrial Strategy (BEIS, 2021). A review

of the draft versions has been undertaken in the context of this PEIR chapter. No new requirements applicable to other marine users were found within the draft EN-3 document.

14. The specific assessment requirements for infrastructure and other users, as detailed in the NPS, are summarised in Table 18.4 together with an indication of the section of the PEIR chapter where each is addressed.

Table 18.4 NPS assessment requirements

NPS Requirement	NPS Reference	PEIR Reference
NPS for Renewable Energy Infrastructure (EN-3)		
'There may be constraints imposed on the siting or design of offshore wind farms because of restrictions resulting from the presence of other offshore infrastructure or activities.'	Section 2.6, paragraph 2.6.35	Chapter 4 Site Selection and Assessment of Alternatives (Volume I) provides the rationale for the location of the array areas and offshore cable corridor, which includes consideration of constraints associated with other offshore infrastructure.
'Where a potential offshore wind farm is proposed close to existing operational offshore infrastructure, or has the potential to affect activities for which a licence has been issued by Government, the applicant should undertake an assessment of the potential effect of the proposed development on such existing or permitted infrastructure or activities. The assessment should be undertaken for all stages of the lifespan of the proposed wind farm in accordance with the appropriate policy for offshore wind farm EIAs.'	Section 2.6, paragraph 2.6.179	The potential impacts are assessed in Section 18.6.
'Applicants should engage with interested parties in the potentially affected offshore sectors early in the development phase of the proposed offshore wind farm, with an aim to resolve as many issues as possible prior to the submission of an application'	Section 2.6, paragraph 2.6.180	Consultation with owners and operators of offshore infrastructure is being undertaken by NFOW, consultation responses received to date are shown in Table 18.1.
'Such stakeholder engagement should continue throughout the life of the proposed development including construction, operation and decommissioning phases where necessary. As many of these offshore industries are regulated by Government, the relevant Secretary of State should also be a consultee where necessary. Such engagement should be taken to ensure that solutions are sought that allow offshore wind farms and other users of the sea to successfully co-exist'.	Section 2.6, paragraph 2.6 181	Consultation with the Secretary of State has been undertaken as part of the scoping phase. Extracts from the scoping opinion from the Secretary of State in relation to the infrastructure and other users are shown in Table 18.1.

18.4.1.2 Other legislation, policy and guidance

15. In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of infrastructure and other users. These include:

- East Inshore and East Offshore Marine Plans (MMO, 2014)

- European Subsea Cable UK Association (ESCA) Guideline No. 6 – The Proximity of Offshore Renewable Energy Installations and Submarine Cable Infrastructure in UK Waters (ESCA, 2016);
- The International Cable Protection Committee (ICPC) has issued a series of recommendations for marine cables, specifically:
  - Recommendations No. 2 – Recommended Routing and Reporting Criteria for Cables in Proximity to Others (ICPC, 2015);
  - Recommendations No. 3 – Criteria to be Applied to Proposed Crossings Submarine Cables and/or Pipelines (ICPC, 2014);
  - Recommendations No. 13 – The Proximity of Offshore Renewable Wind Energy Installations and Submarine Cable Infrastructure in National Waters (ICPC, 2013); and
- Oil and gas licensing rounds information (Oil and Gas Authority, 2018).

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

18.4.2 Data sources

18.4.2.1 Site specific

17. The data sources that have been used to inform the assessment are listed in Table 18.5.

Table 18.5 Other available data and information sources

Data Set	Spatial Coverage	Year	Notes
Offshore Cables	UK	2021	https://www.marinefind.co.uk/
Wind farms	UK and EU	2021	https://www.4coffshore.com/offshorewind/
Oil and Gas Infrastructure	UK	2021	https://ogauthority.maps.arcgis.com/home/index.html
Aggregate Sites	UK	2021	https://thecrownestate.maps.arcgis.com/home/index.html
Dredger Transit Routes	UK	2009	https://bmapa.org/issues/renewable_energy.php
Disposal Sites	UK	2021	https://data.cefas.co.uk/view/407

18.4.3 Impact assessment methodology

18. Chapter 6 EIA Methodology (Volume I) explains the general impact assessment methodology applied to the Project. The following sections describe the methods used to assess the likely significant effects on infrastructure and other users.

19. The assessment of impacts on infrastructure and other users has focused on establishing potential for overlaps, interactions and the consequential potential

for conflict between activities in both a geographical and temporal context. This information has additionally been obtained through statements made in publicly available literature (e.g., information in an EIA or Scoping Report).

18.4.3.1 Definitions

20. For each potential impact, the assessment identifies receptors within the study 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 infrastructure and other users assessment are provided in Table 18.6 and Table 18.7.

Table 18.6 Definition of sensitivity

Sensitivity	Definition
High	High value activity/activity fundamental to the operator or infrastructure that is of international or national economic importance. No redundancy available in the event of impact. Asset very sensitive to the impact. For example, gas pipeline, electrical infrastructure or telecommunication cable supporting UK or European activity or nationally important aggregates area where extraction company has no access to areas of equal quality aggregates.
Medium	Medium value activity. Impact to asset would significantly reduce operators' activities but not result in complete failure to continue operations. Limited redundancy available. Asset regionally important. Asset has limited tolerance of impact. For example, gas pipeline, electrical infrastructure or telecommunication cable, where asset owners have some potential for redundancy planning. Aggregates areas where extraction company has some, but limited access to equal quality aggregate.
Low	Low value activity. Impact to asset would have limited implications on operator/public either due to the availability of redundancy or limited pathway for impact. Asset has some tolerance of impact. For example, electrical or telecommunication cable with ability to undertake redundancy planning to limit impact. Aggregates area where extraction company has access to large area of equal quality aggregate.
Negligible	Low value activity, operators' activities would not be significantly reduced by impact. Asset generally tolerant of impact. Limited impact to asset owners or local community in case of damage or failure.

Table 18.7 Definition of magnitude

Magnitude	Definition
High	Loss of resource and / or quality and integrity of receptor; severe damage to key characteristics, features or elements. For example, accidental damage to asset resulting in permanent or long term inoperability or complete loss of access to economically important asset.
Medium	Loss of resource, but not adversely affecting integrity of resource; partial loss of / damage to key characteristics, features or elements. For example, damage to an asset that results in either short term, complete inoperability or long term reduced functionality. Partial loss of access to economically important asset, or short term complete loss of access.
Low	Some measurable change in attributes, quality or vulnerability, minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. For example, accidental damage to asset resulting in short term reduction of functionality but not complete loss of function. Short term disruption to access of asset.
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements, and / or slight alteration to activity.

18.4.3.2 Significance of effect

21. 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 significance of effect matrix, as shown in Table 18.8. Definitions of each level of significance are provided in Table 18.9.

22. Likely effects identified within the assessment as major or moderate are regarded within the 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 18.8 Significance of effect matrix

		Negative 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 18.9 Definition of impact 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 national, 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.

18.4.4 Cumulative effects assessment methodology

23. The cumulative effects assessment (CEA) considers other plans, projects and activities that may interact cumulatively with the Project. Chapter 6 EIA

Methodology (Volume I) provides further details of the general framework and approach to the CEA.

24. For infrastructure and other users, these activities include other offshore wind farm projects, shore-based maintenance works, oil and gas development activities and active restricted areas.

18.4.5 Transboundary effects assessment methodology

25. Transboundary effects on infrastructure and other users have been scoped out in line with the scoping opinion (Planning Inspectorate, 2021), therefore no further assessment has been undertaken.

18.4.6 Assumptions and limitations

26. Characterisation of the existing environment and the resulting impact assessment is based on publicly available information, purchased data or information gained directly from the relevant operators / organisations during consultation. There may be elements of uncertainty associated with the locations of some existing infrastructure and where this is the case, this will be discussed with the owners / operators and / or established during pre-construction surveys as necessary. For the purposes of the assessment, it is assumed that infrastructure could be anywhere within the Project boundaries.

18.5 Existing environment

27. The following infrastructure and other users are scoped into the EIA, in accordance with the scoping opinion (Planning Inspectorate, 2021):

- Offshore wind farms;
- Cables;
- Outfall pipes;
- Dredging sites;
- Disposal sites; and
- MoD activities.

18.5.1 UK southern North Sea wind farms

28. UK waters and the southern North Sea in particular are a focus of significant offshore wind development activity, having been subject to several phases of offshore wind development under The Crown Estate's various leasing rounds (Round 1, Round 2, Round 1 and 2 extensions, Round 3 and Round 4 developments).

18.5.1.1 Operational offshore wind farms

29. Nearby operational OWFs in the area include the parent Greater Gabbard offshore wind farm (GGOW), and also Galloper wind farm (GWF), London Array, Thanet, Gunfleet Sands (I, II and Demo), Kentish Flats and East Anglia ONE (Figure 18.1, Volume II). A summary of all OWFs in the vicinity of the Project is provided in Table 18.10.

30. North Falls and GGOW are owned by both SSE Renewables (50%) and RWE Renewables (50%). SSE Renewables acts as the operator of the GGOW on behalf of the consortium. RWE also has 25% ownership of GWF.

31. The next nearest operational wind farm to the Project is London Array, located c. 20km to the west of North Falls, with export cables making landfall in North Kent. London Array has been operational since 2012 (Ørsted, 2021).

32. NFOW will ensure that the development of North Falls is undertaken in such a way to limit and, where possible, avoid any likely significant effects on existing OWFs.

18.5.1.2 Offshore wind farm export cables

33. The North Falls offshore export cables would make landfall adjacent to the existing offshore export cable landfall for the Gunfleet Sands I operational wind farm (Figure 18.1, Volume II).

34. Site selection for North Falls avoided the offshore export cables from any other operational wind farms (Figure 18.1, Volume II), discussed further in Chapter 4 Site Selection and Assessment of Alternatives (Volume I).

18.5.1.3 Consented offshore wind farms

35. The consented East Anglia TWO and East Anglia ONE North wind farms are c.15km and 47km from the North Falls northern array. These wind farms are expected to complete construction prior to North Falls.

18.5.1.4 Offshore wind farms in planning

36. Within the study area, the Five Estuaries OWF, an extension to GWF being developed by RWE, is currently in the pre-submission stage of consenting and on a similar timescale to North Falls. A good neighbour agreement is in place between Five Estuaries Offshore Wind Farm Ltd and NFOW.

18.5.1.5 Offshore wind farm summary

37. A summary of existing and consented offshore wind farms in the study area is provided in Table 18.10.

Table 18.10 Offshore wind farms in the southern North Sea

Offshore Wind Farm	Status	Developer[1]	Distance from North Falls (km)	
			North	South
GGOW	Operational	Greater Gabbard Offshore Winds Limited	0	0
GWF	Operational	Galloper Wind Farm Limited	<1	0
Five Estuaries	Pre-planning Application	Five Estuaries Offshore Wind Farm Limited	10.5	0
East Anglia TWO	Consented	East Anglia TWO Limited	14.8	27.5
East Anglia ONE	Operational	East Anglia One Limited	38.5	48.2

[1] Information derived from 4COffshore https://www.4coffshore.com/

Offshore Wind Farm	Status	Developer[1]	Distance from North Falls (km)	
			North	South
London Array	Operational	London Array Limited	35.6	21.3
Gunfleet Sands II	Operational	Gunfleet Sands II Limited	43.4	36.8
East Anglia ONE North	Consented	East Anglia ONE North Limited	47.3	59.2
Thanet	Operational	Vattenfall Wind Power Limited	56.1	25.2
Gunfleet Sands Demo	Operational	Ørsted Gunfleet Sands Demo (UK) Limited	44	47.5
Gunfleet Sands I	Operational	Gunfleet Sands Limited	46.2	45.3
Gunfleet Sands II	Operational	Gunfleet Sands II Ltd	43.4	36.8
Kentish Flats	Operational	GREP UK Marine Ltd	72.7	55.4
Kentish Flats Extension	Operational	Vattenfall	72.76	54.01

18.5.2 Subsea cables

38. The southern North Sea is crossed by many cables, and the majority of those not related to offshore wind are telecommunication cables between the UK and mainland Europe (Figure 18.2, Volume II). Several electrical interconnector cables also connect the power grids of the UK and mainland Europe.

39. There are currently two operational cables, one telecommunication and one electrical, that cross the Project southern array. The Atlantic Crossing 1 is a telecommunications cable connection between the UK and the Netherlands. Additionally, the Britned HVDC is an electrical interconnector cable connecting the UK and the Netherlands.

40. Additionally, the Gunfleet Sands wind farm export cable has a landfall to the south of the North Falls landfall search area.

Table 18.11 – Summary of offshore cables which intersect the offshore project area

Asset Name	Status	Asset Type	Operator	General Trajectory	Interaction
Greater Gabbard export cables	Active	Offshore wind export cable	Greater Gabbard Offshore Transmission Operator (OFTO)	South to north	Runs 25m north of North Falls north array
Greater Gabbard interconnector	Active	Offshore wind interconnector		South to north	Bisects North Falls south array
Galloper export cable	Active	Offshore wind export cable	Diamond Transmission Partners Galloper Limited	South to north	Runs 1km north of North Falls north array
Atlantic Crossing 1	Active	Telecommunications cable	Century Link	North to south	Overlaps North Falls south array
Britned	Active	Interconnector cable	Britned	West to east	Bisects North Falls south array
NeuConnect	Pre-construction	Interconnector cable	NeuConnect	West to east	Bisects North Falls offshore cable corridor and interconnector cable
Gunfleet Sands export cables	Active	Offshore wind export cable	Gunfleet Sands OFTO	North to south	Overlaps the landfall search area
Nautilus	Proposed	Interconnector cable	National Grid Ventures (NGV)	West to east	Cable route unknown, however, there is potential interaction with north and south array
South & East Anglia (SEA) Link	Proposed	Interconnector cable	National Grid Electricity Transmission	North to south	Cable route unknown, however, there is potential interaction with north and south array

18.5.3 Outfall pipes

41. There is one outfall pipe located at the landfall search area, north east of Frinton Golf Course. This is a sewage outfall pipe.

18.5.4 Dredging sites

42. There are no aggregate production agreement areas or exploration and option areas located within the offshore project area.

43.

44. Table 18.12 shows the aggregate sites in the study area. The nearest production agreement area to the northern array area is licensed to CEMEX UK Marine Ltd (507/6) until March 2036. This area is located 0.2km to the west of the northern array area.

45. The nearest production agreement area to the southern array area is licenced to DEME Building Materials Ltd (524). This area is adjacent to the south-east of the southern array area.

46. In addition to aggregate dredging, the North Falls offshore cable corridor site selection was undertaken to avoid the Harwich Haven approach channel dredging area (discussed in Chapter 4 Site Selection and Assessment of Alternatives, Volume I). The tip of the Harwich Haven dredging channel is c.0.18km from the North Falls offshore cable corridor.

Table 18.12 Aggregate sites in the study area

Project	Closest distance from the array areas (km)	Closest distance from the export cable corridor (km)
Outer OTE aggregate exploration and option area 528/2	8.4	14
East Orford Ness aggregate exploration and option area 1809	2	24.8
Thames D aggregates production agreement area 524	0	12.5
Southwold East aggregates production agreement area 430	27.3	48.4
North Inner Gabbard aggregate production area 498	1.7	24
Shipwash aggregate exploration and option area 507	0.2	9.8
Harwich Haven approach channel	18.8	0.18
Longsand aggregate exploration and option area 508	11.7	5.8
Longsand aggregate exploration and option area 509	11.7	2.1
Longsand aggregate exploration and option area 510	7.3	3.5
North Falls East aggregate exploration and option area 501	13.2	27.5

18.5.5 Disposal sites

47. There are three closed disposal sites which overlap the offshore project area:

- The Warren Spring EXPTL Area 2/1 (TH024) overlapping the northern array area;
- Galloper OWF (TH057) overlapping the southern array; and
- Britned (NS100) overlapping the southern array.

48. Sediment quality in the area is detailed in Chapter 9 Marine Water and Sediment Quality (Volume I).

49. The nearest open disposal site to the northern array area (c. 4km north east) is the Inner Gabbard East (TH056) which slightly overlaps the North Falls interconnector cable corridor. The nearest open disposal site to the southern array area is South Falls (TH070) at c. 8km south east (Figure 18.2, Volume II).

50. The Ministry of Defence also confirmed in the Scoping Opinion (Planning Inspectorate, 2021) that the eastern extent of the Gunfleet X5118 PEXA (see Section 18.5.6) has a disused unexploded ordinance (UXO) disposal area.

18.5.6 Ministry of Defence activities

51. The following non-danger military practice and exercise areas (PEXAs) overlap or are in proximity to the North Falls offshore project area:

- Kentish Knock – X5119 (overlaps the southern array area);
- North Galloper – X5121 (adjacent to the eastern boundary of the southern array area);
- Outer Gabbard – X5117 (located between the northern and southern array);
- South Galloper – X5120 (overlaps the southern array area); and
- Gunfleet – X5118 (overlaps the offshore cable corridor).

52. No danger PEXAs overlap with the offshore project area. The closest danger PEXA is c. 11km to the south of the offshore cable corridor

53. There is also potential for wartime UXO within the southern North Sea (EAOW, 2012). Locations of any UXO would be determined post-consent and mitigation agreed in consultation with Natural England and the MMO. Based on engineering experience, an estimated 15 UXO clearance operations are included in the worst case scenario (Table 18.2).

18.5.7 Future trends in baseline conditions

54. The deployment of offshore wind in the UK is set to continue with an existing pipeline of projects in planning to achieve a target of 50GW offshore wind capacity by 2030. Therefore, offshore wind deployment in the southern North Sea and wider North Sea is likely to increase over the next decade.

55. There are plans to further integrate the UK electrical network and the European markets through the installation of interconnector cables. This is likely to lead to an increase in electricity transmission cables across the southern North Sea, such as the Britned interconnector.

56. New disposal sites associated with proposed OWFs are likely to be designated, the areas of which will align with the OWF agreement for lease areas.

57. The East Anglia coast (i.e., Norfolk and Suffolk) has been highlighted in the East Marine Plan (HM Government, 2014) as being an important area for aggregates for the UK, with a view of facilitating growth of the aggregates industry in this area of the UK seabed. It is expected that aggregate extraction activity will increase over the next 10-20 years (HM Government, 2014) as a strategic industry for this area.

18.6 Assessment of significance

58. The likely significant effects on infrastructure and other users that may occur during construction, operation, maintenance and decommissioning of North Falls are assessed in this section. The worst-case scenarios listed in Table 18.2 for each impact are assessed using the methodology described in Section 18.4.3 and in Chapter 6 EIA Methodology (Volume I).

18.6.1 Potential impacts during construction

18.6.1.1 Impact 1: Potential interference with other wind farms

18.6.1.1.1 Magnitude of impact

59. Interference of North Falls with other wind farms could arise from the following:

- Navigational safety issues;
- Aviation (i.e., helicopter operations);
- Overlap of infrastructure and potential interactions during construction; and
- Increased pressure on port facilities.

60. Issues arising from shipping/navigation and aviation are assessed in Chapter 15 Shipping and Navigation (Volume I) and Chapter 17 Aviation and Radar (Volume I) respectively.

61. Chapter 15 (Volume I) concludes that the activities associated with shipping and navigation will be managed and regulated to ensure safe operations, therefore the effect of North Falls on the shipping and navigation of other projects is expected to be tolerable and therefore not significant.

62. Chapter 17 (Volume I) concludes that the effects of the creation of an aviation obstacle and increased air traffic related to wind farm activities would not be significant.

63. Given the conclusions of Chapter 15 and Chapter 17 (Volume I), the magnitude of impact will be negligible.

18.6.1.1.2 Sensitivity of receptor

64. Wind farm construction activities have the potential to interfere with the activities of other wind farms. Potential disruption caused to other wind farms could potentially impact the construction schedules of other wind farm projects, therefore increasing the likelihood of navigational safety issues. The sensitivity of OWFs to interference is medium.

18.6.1.1.3 Significance of effect

65. Based on the worst case negligible magnitude of impact and medium sensitivity of receptor, the significance of effect would be minor adverse.

18.6.1.2 Impact 2: Physical impacts on subsea cables and pipelines

18.6.1.2.1 Magnitude of impact

66. Wind farm construction activities, such as cable and foundation installation, vessel anchoring and debris clearing operations in proximity to other cables have the potential to cause damage to the other subsea cables. Any damage caused to subsea cables would be expensive to repair and could disrupt the telecommunications or power supply of the subsea cable operations.

67. Crossing and proximity agreements will be agreed post-consent which will determine how cable crossings are enabled and outline the proximity arrangements of construction activities to the existing subsea cables. The resultant locations, design and construction methodologies will aim to reduce the physical impact upon other cables which may affect their operation.

68. The precise number of cable crossings is not yet known as the array cable layout will be determined post consent and information on the routes of a number of planned interconnector cables is not available.

69. Cable owners are, and will continue to be, consulted by the Applicant during the pre-construction development of the Project. All commercial and technical agreements would be put in place ahead of the commencement of construction. Crossing and proximity agreements would be agreed post-consent during the wind farm design period.

70. Taking into account the embedded mitigation measures outlined in Section 18.3.3, including securing proximity and crossings agreements with operators, any impact is extremely unlikely and therefore the impact magnitude is negligible.

71. No impact is predicted on the outfall pipes in the landfall search area and the final landfall site selection will avoid physical impact on these pipes insofar as it is practicable.

18.6.1.2.2 Sensitivity of receptor

72. A worst-case scenario is assumed as being accidental damage to a subsea cable from the wind farm construction activities which may damage a subsea cable, reduce the subsea cables capacity or make the subsea cables operation redundant. It is therefore considered that the sensitivity of cables is high.

73. The sewage outfall pipe in the landfall search area is also considered to have high sensitivity to accidental damage.

18.6.1.2.3 Significance of effect

74. Based on the worst case negligible magnitude of impact and high sensitivity of receptor, the significance of effect would be minor adverse.

18.6.1.3 Impact 3: Impacts on disposal sites

18.6.1.3.1 Magnitude of impact

75. It is anticipated that construction activities within the array areas and offshore cable corridor will not interfere with disposal operations at the nearest open disposal site, Inner Gabbard East (TH056) (c. 4km from the offshore project area).

76. Impacts associated with sediment quality associated with open and disused disposal sites (and other sources of contamination) are assessed in Chapter 9 Marine Sediment and Water Quality (Volume I).

18.6.1.3.2 Sensitivity of receptor

77. There is no potential disruption to disposal operations at Inner Gabbard East (TH056) and therefore the receptor is not sensitive to this impact.

18.6.1.3.3 Significance of effect

78. The significance of effect would be 'no change'.

18.6.1.4 Impact 4: Impacts on dredging

18.6.1.4.1 Magnitude of impact

79. As discussed in Section 18.5.4, the northern array area of North Falls lies within 200m of the site 507/6 which is licenced for aggregate extraction until March 2036. North Falls construction would be expected to commence in the late 2020s, with the aim of commissioning around 2030 and therefore during the period of overlap between the active production licence at site 507/6 and construction of North Falls. The project could therefore interfere with the dredging activities of site 507/6. Aggregate extraction is undertaken on the basis of supply and demand and therefore the amount of overlap in activities during this time is uncertain, but an increase in demand is expected.

80. Due to the proximity of the North Falls offshore project area to sites 507/6 and 524, the presence of infrastructure and vessels could restrict dredging operations.

81. Consultation with the site operators (Cemex and DEME) is ongoing and they will be included in a hazard workshop to inform the Navigational Risk Assessment (NRA), post-PEIR (see Chapter 15 Shipping and Navigation, Volume I). At this stage, Chapter 15 (Volume I) concludes that the effects on aggregate dredging will be Tolerable, on the basis of suitable mitigation being agreed to ensure the impact is as low as reasonably practicable. The magnitude of impact is therefore expected to be low with some measurable change in attributes of the aggregate extraction. This will be reviewed in the Environmental Statement, based on the ongoing consultation with Cemex.

82. Impacts on other aggregate dredging sites are expected to be the same as, or less than that on sites 507/6 and 524, therefore the overall impact magnitude on aggregate dredging sites is low.

83. Impacts on the dredging of the approach channel for Harwich Haven would also be of low magnitude, as a worst case scenario, due to the avoidance of this area during site selection. Consultation with Harwich Haven is ongoing in relation to Chapter 15 Shipping and Navigation (Volume I) to ensure impacts

on vessels using the approach channel are tolerable and as low as reasonably practicable.

18.6.1.4.2 Sensitivity of receptor

84. Any potential disruption caused to dredging activities could result in some loss of access to the aggregate sites. It is therefore considered that the sensitivity of the receptor is medium.

18.6.1.4.3 Significance of effect

85. Based on the worst case low magnitude of impact and medium sensitivity of receptor, the significance of effect would be minor adverse.

18.6.1.5 Impact 5: Impacts on MoD activities

86. It is anticipated that the Project would not impact on any MoD activities, in accordance with the Defence Infrastructure Organisation's response to the Scoping Report (provided in the Scoping Opinion; Planning Inspectorate, 2021). As such, the significance of effect would be 'no change'.

18.6.2 Potential impacts during operation

18.6.2.1 Impact 1: Potential interference with other wind farms

18.6.2.1.1 Magnitude of impact

87. During operation and maintenance, effects on other OWFs would relate to vessel and/or helicopter movements which are expected to be significantly less than for the construction phase.

88. Any conflicts with vessel and/or aviation activities are detailed in Chapter 15 Shipping and Navigation (Volume I) and Chapter 17 Aviation and Radar (Volume I).

89. Chapter 15 (Volume I) concludes that the activities associated with shipping and navigation will be managed and regulated to ensure safe operations, therefore the effect of North Falls on the shipping and navigation of other projects is expected to be tolerable and therefore not significant.

90. Chapter 17 (Volume I) concludes that the effects of the creation of an aviation obstacle and increased air traffic related to wind farm activities would not be significant.

91. Given the conclusions of Chapter 15 and Chapter 17 (Volume I), the magnitude of impact will be negligible.

18.6.2.1.2 Sensitivity of receptor

92. Potential disruption inflicted on other wind farms could potentially impact the operation and maintenance of other wind farm projects, therefore increasing the likelihood of navigational safety issues. The sensitivity of OWFs to interference is therefore medium.

18.6.2.1.3 Significance of effect

93. Based on the worst case negligible magnitude of impact and medium sensitivity of receptor, the significance of effect would be minor adverse.

18.6.2.2 Impact 2: Physical impacts on subsea cables and pipelines

18.6.2.2.1 Magnitude of impact

94. During operation and maintenance, effects on subsea cables and pipelines and damage to subsea cables and pipelines are expected to be significantly less than for the construction phase.

95. Maintenance of North Falls infrastructure has potential to interact with existing cables e.g., through the placement of jack up vessels and repairs or reburial of the North Falls cables (if required). However, the potential requirement for maintenance will be taken into account during the final design of project infrastructure locations.

96. Due to the use of horizontal directional drilling at landfall there would be no impact on the pipeline during operation and maintenance.

97. Taking into account the embedded mitigation measures outlined in Section 18.3.3, including crossings and proximity agreements, any impact is extremely unlikely and therefore the impact magnitude is negligible.

18.6.2.2.2 Sensitivity of receptor

98. A worst-case scenario is assumed as being accidental damage to a subsea cable from the wind farm construction activities which may damage a subsea cable, reduce the subsea cables capacity or make the subsea cables operation redundant. The sensitivity of these receptors is considered to be high.

18.6.2.2.3 Significance of effect

99. Based on the worst case negligible magnitude of impact and high sensitivity of receptor, the significance of effect would be minor adverse.

18.6.2.3 Impact 3: Impacts on disposal sites

18.6.2.3.1 Magnitude of impact

100. During operation and maintenance there will be no negative repercussions to the integrity of the site Inner Gabbard East (TH056). The effect significance will therefore be ‘no change’.

18.6.2.4 Impact 4: Impacts on dredging

18.6.2.4.1 Magnitude of impact

101. During operation and maintenance, effects on dredging sites are expected to be significantly less than for the construction phase.

102. Effects on disposal sites could arise from maintenance vessel movements and the presence of infrastructure in proximity to the dredging areas, as there is no direct overlap with North Falls.

103. Consultation with Cemex, DEME and Harwich Haven is ongoing and they will be included in a hazard workshop to inform the NRA, post-PEIR (see Chapter 15 Shipping and Navigation).

104. At this stage, the magnitude of impact is expected to be low with the application of embedded mitigation measures through stakeholder engagement. This will be reviewed in the Environmental Statement, based on the ongoing consultation with Cemex, including the hazard workshop and informed by the conclusions of the Navigation Risk Assessment.

18.6.2.4.2 Sensitivity of receptor

105. Any potential disruption caused to dredging activities could result in short term loss of access. It is therefore considered that the sensitivity of the receptor is medium.

18.6.2.4.3 Significance of effect

106. Based on the worst case negligible magnitude of impact and low sensitivity of receptor, the significance of effect would be minor adverse.

18.6.2.5 Impact 5: Impacts on MoD activities

107. It is anticipated that the Project would not impact on any MoD activities, in accordance with the Defence Infrastructure Organisation's response to the Scoping Report (provided in the Scoping Opinion; Planning Inspectorate, 2021). As such, the significance of effect would be 'no change'.

18.6.3 Potential impacts during decommissioning

108. Effects upon infrastructure and other marine users during decommissioning of the Project are anticipated to be comparable to or less than the construction phase.

109. A decision regarding the final decommissioning policy is yet to be decided as it is recognised that rules and legislation change over time in line with best industry practice. The decommissioning methodology and programme would need to be finalised nearer to the end of the lifetime of the proposed North Falls to ensure it is in line with the most recent guidance, policy and legislation.

110. The scope of the decommissioning works would most likely involve removal of the accessible installed components. This is outlined in Chapter 5 Project Description (Volume I) and the detail would be agreed with the relevant authorities at the time of decommissioning. Offshore, this is likely to include removal of all of the wind turbine components and part of the foundations (those above seabed level), removal of some or all of the array and export cables. Scour and cable protection would likely be left in situ.

111. The worst case scenario in terms of interactions with infrastructure and other users during the decommissioning phase is based on the project envelope options that would result in the greatest amount of activity during the phase.

112. Should certain infrastructure be left in situ, the impacts what be comparable to the operational phase.

18.6.3.1 Impact 1: Potential interference with other wind farms

113. The sensitivity of receptors and magnitude of impact would be comparable to those identified for the construction phase. Namely, medium sensitivity and negligible magnitude.

18.6.3.1.1 Significance of effect

114. The significance of effect for interference with other wind farms is therefore minor adverse.

18.6.3.2 Impact 2: Physical impacts on subsea cables and pipelines

115. The sensitivity of receptors and magnitude of impact would be comparable to those identified for the construction phase. Namely, high sensitivity and negligible magnitude.

18.6.3.2.1 Significance of effect

116. The significance of effect for physical impacts on subsea cable and pipelines is therefore minor adverse.

18.6.3.3 Impact 3: Impacts on disposal sites

117. During decommissioning there will be no negative repercussions to the integrity of the site Inner Gabbard East (TH056). The effect significance will therefore be 'no change'.

18.6.3.4 Impact 4: Impacts on dredging

118. The sensitivity of receptors and magnitude of impact would be comparable to those identified for the construction phase. Namely, medium sensitivity and low magnitude.

18.6.3.4.1 Significance of effect

119. The significance of effect for impacts on dredging is therefore minor adverse.

18.6.3.5 Impact 5: Impacts on MoD activities

120. It is anticipated that the Project would not impact on any MoD activities, in accordance with the Defence Infrastructure Organisation's response to the Scoping Report (provided in the Scoping Opinion; Planning Inspectorate, 2021). As such, the significance of effect would be 'no change'.

18.7 Cumulative effects

18.7.1 Identification of potential cumulative effects

121. 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 18.13. Only potential effects assessed in Section 18.6.1. as negligible adverse 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 impact).

Table 18.13 Potential cumulative effects

Impact	Potential for cumulative effects	Rationale
Potential interference with other OWFs	Yes	Plans and projects currently in planning have potential to have cumulative effects on existing OWFs
Physical impacts on subsea cables	Yes	Plans and projects currently in planning have potential to have cumulative effects on existing subsea cables
Potential impacts on dredging	Yes	Plans and projects currently in planning have potential to have cumulative effects on dredging
Impacts on disposal sites	No	No likely significant effect from North Falls is predicted
Impacts on MoD activities	No	

18.7.2 Other plans, projects and activities

122. 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 18.14 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.

123. 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 18.3.1) 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.

124. The likely significant effect of North Falls alone on each of the projects shown in Table 18.14 is assessed in Section 18.6. The CEA considers the cumulative effect of plans and projects that are not yet installed on projects that are in place within the study area (Section 18.3.1).

Table 18.14 Summary of projects considered for the CEA in relation to infrastructure and other users (project screening)

Project	Status	Construction period	Closest distance from the array areas (km)	Closest distance from the export cable corridor (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Five Estuaries OWF	In Planning	Assumed late 2020s	0	14.8	Medium	Yes	Potential for cumulative effect during construction and operational phases due to the proximity of the projects.
East Anglia TWO OWF	Consent granted	Construction planned mid 2020s	14.8	37.2	High	Yes	
East Anglia ONE North OWF	Consent granted	Construction planned mid 2020s	47.3	70	High	Yes	
NeuConnect Interconnector	Pre-construction	2022-2028	0 km	0 km	High	Yes	The NeuConnect Interconnector bisects the North Falls export cable corridor and interconnector cable corridor and there is potential for temporal overlap of cable installation activities.
Nautilus	Pre-planning	Unknown	Cable route unknown	Cable route unknown	Low	Yes, subject to available information	The interconnector is expected to be routed in proximity to North Falls
SEALink	Pre-planning	Unknown	Cable route unknown	Cable route unknown	Low	Yes, subject to available information	
EuroLink Interconnector	Pre-planning	Unknown	Cable route unknown	Cable route unknown	Low	Yes, subject to available information	
Tarchon Energy Interconnector	Pre-planning	Unknown	Cable route unknown	Cable route unknown	Low	Yes, subject to available information	
Outer OTE aggregate exploration and option area 528/2	Unknown	N/A	8.4	14	Low	Yes, subject to available information	There is potential for some interaction between dredging and aggregate exploration on navigational safety.

Project	Status	Construction period	Closest distance from the array areas (km)	Closest distance from the export cable corridor (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
East Orford Ness aggregate exploration and option area 1809	Unknown	N/A	2	24.8	Low	Yes, subject to available information	Presence of multiple vessels have the potential to have a cumulative effect.
Thames D aggregates production agreement area 524	Production agreement secured 2022	2022-2036	0	12.5	Low	Yes, subject to available information	
Southwold East aggregates production agreement area 430	Operational since 2012	N/A	27.3	48.4	Medium	Yes	
North Inner Gabbard aggregate production area 498	Operational since 2015	N/A	1.7	24	Medium	Yes	
Shipwash aggregate exploration and option area 507	Operational since 2016	N/A	0.2	9.8	High	Yes	
Harwich Haven approach channel	Operational since 2000	N/A	18.8	0.18	High	Yes	
Longsand aggregate exploration and option area 508	Operational since 2014	N/A	11.7	5.8	Medium	Yes	
Longsand aggregate exploration and option area 509	Operational since 2015	N/A	11.7	2.1	Medium	Yes	

Project	Status	Construction period	Closest distance from the array areas (km)	Closest distance from the export cable corridor (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Longsand aggregate exploration and option area 510	Operational since 2015	N/A	7.3	3.5	Medium	Yes	
North Falls East aggregate exploration and option area 501	Operational since 2017	N/A	13.2	27.5	Medium	Yes	

18.7.3 Assessment of cumulative effects

18.7.3.1 Overview

125. The following sections provide an assessment of cumulative effects for those effects and projects screened into the CEA (Sections 18.7.1 and 18.7.2, respectively).

126. It should be noted that the plans and projects screened into the CEA (Table 18.14) are being developed in accordance with the East Inshore and Offshore Marine Plans. In addition, in order to secure an Agreement for Lease (AfL) with The Crown Estate, a proximity check is undertaken for each project to ensure no significant interference with other AfLs is likely. It can therefore be expected that cumulative effects on infrastructure and other users will be not significant.

18.7.3.2 Cumulative effect 1: Potential interference with other offshore wind farms

127. As with the effect of North Falls alone on other OWFs(Section 18.6.1.1), the cumulative effect of North Falls with the other plans and projects screened into the CEA (Table 18.14) could arise from the following:

- Navigational safety issues;
- Aviation (i.e., helicopter operations);
- Overlap of infrastructure and potential interactions during construction, operation and decommissioning; and
- Increased pressure on port facilities.

128. Issues arising from shipping/navigation and aviation are assessed in Chapter 15 Shipping and Navigation (Volume I) and Chapter 17 Aviation and Radar (Volume I), respectively.

129. The CEA for Chapter 15 Shipping and Navigation (Volume I) concludes that the cumulative effects will be tolerable on the basis of embedded mitigation which will be agreed through the Hazard workshop post-PEIR, and noting that further assessment at ES stage will be required to ensure the impact is as low as reasonably practicable.

130. Chapter 17 (Volume I) concludes that the cumulative effects of the creation of an aviation obstacle and increased air traffic related to wind farm activities would also not be significant.

131. Taking into account the embedded mitigation measures outlined in Section 18.3.3, the magnitude of impact will be low. The receptor sensitivity is medium (as described in Section 18.6.1.1.2) and therefore the significance of effect would be minor.

18.7.3.3 Cumulative effect 2: Physical impacts on subsea cables

132. The requirement for proximity and crossings agreements would apply to all projects screened into the CEA, where relevant, therefore, this embedded mitigation would ensure the cumulative impact magnitude is negligible. The receptor sensitivity is medium (as described in Section 18.6.1.2.2) and therefore the significance of effect would be minor.

18.7.3.4 Cumulative effect 3: Impacts on dredging activities

133. There is potential for cumulative effects with North Falls and the projects screened into the CEA, primarily arising from navigational safety issues due to increased vessel traffic in the study area.

134. Chapter 15 Shipping and Navigation (Volume I) concludes that the cumulative effects will be tolerable on the basis of embedded mitigation which will be agreed through the Hazard workshop post PEIR, and noting that further assessment at ES stage will be required to ensure the impact is as low as reasonably practicable.

135. Considering the embedded mitigation measures outlined in Section 18.3.3, the magnitude of impact will be low. The receptor sensitivity is medium (as described in Section 16.6.1.4.2) and therefore the significance of effect would be minor.

18.8 Interactions

136. Table 18.15 presents the interactions between impacts discussed in this chapter and those discussed in other chapters (Volume I).

Table 18.15 Infrastructure and Other Users interactions

Topic and description	Related chapter (Volume I)	Where addressed in this chapter
Potential interference with other wind farms	Chapter 15 Shipping and Navigation, Chapter 17 Aviation and Radar	Section 18.6.1.1
Physical impacts on subsea cables	Chapter 15 Shipping and Navigation	Section 18.6.1.2
Impacts on disposal sites	Chapter 9 Marine Water and Sediment Quality	Section 18.6.1.3
Impacts on dredging sites	Chapter 9 Marine Water and Sediment Quality, and Chapter 15 Shipping and Navigation	Section 18.6.1.4
Impacts on MoD activities	Chapter 17 Aviation and Radar	Section 18.6.1.5

18.9 Inter-relationships

137. There is no potential for inter-relationships between impacts on the different infrastructure and other users described in this chapter as these are all separate, non-related receptors.

18.10 Summary

138. Table 18.16 presents the predicted impacts on infrastructure and other users during the construction, operation and decommissioning of the Project. As shown, the effects of North Falls on infrastructure and other users are not anticipated to exceed minor adverse significance (not significant in EIA terms).

Table 18.16 Summary of likely significant effects on infrastructure and other users topic

Potential impact	Receptor	Sensitivity	Magnitude of impact	Additional mitigation measures	Residual effect
Construction					
Impact 1: Potential Interference with other wind farms	OWFs	Medium	Negligible	N/A	Minor
Impact 2: Physical Impacts on subsea cables	Subsea cables	High	Negligible	N/A	Minor
Impact 3: Impacts on disposal sites	Disposal site operators	No impact	No impact	N/A	No change
Impact 4: Impacts on dredging	Dredging site operators	Medium	Low	N/A	Minor
Impact 5: Impacts on MoD activities	MOD	No impact	No impact	N/A	No change
Operation					
Impact 1: Potential Interference with other wind farms	OWFs	Medium	Negligible	N/A	Minor
Impact 2: Physical Impacts on subsea cables	Subsea cables	High	Negligible	N/A	Minor
Impact 3: Impacts on disposal sites	Disposal site operators	No impact	No impact	N/A	No change
Impact 4: Impacts on dredging	Dredging site operators	Medium	Low	N/A	Minor
Impact 5: Impacts on MoD activities	MOD	Negligible	Negligible	N/A	Negligible
Decommissioning					
Impact 1: Potential Interference with other wind farms	OWFs	Medium	Negligible	N/A	Minor
Impact 2: Physical Impacts on subsea cables	Subsea cables	High	Negligible	N/A	Minor
Impact 3: Impacts on disposal sites	Disposal site operators	Negligible	Negligible	N/A	Negligible

Potential impact	Receptor	Sensitivity	Magnitude of impact	Additional mitigation measures	Residual effect
Impact 4: Impacts on dredging	Dredging site operators	Medium	Low	N/A	Minor
Impact 5: Impacts on MoD activities	MOD	Negligible	Negligible	N/A	Negligible

18.11 References

Department for Business, Energy and Industrial Strategy (BEIS) (2021) Draft National Policy Statement for Renewable Energy Infrastructure (EN-3). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015236/en-3-draft-for-consultation.pdf
Department of Energy and Climate Change (DECC) (2011) National Policy Statement for Renewable Energy Infrastructure (EN-3). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47856/1940-nps-renewable-energy-en3.pdf
European Subsea Cables Association (ESCA) (2016). Guidelines. Available at: http://www.escaeu.org/guidelines
International Cable Protection Committee (2013). ICPC Recommendation #13, The Proximity of Offshore Renewable Wind Energy Installations and Submarine Cable Infrastructure in National Waters, Issue 2A, 26 November 2013
International Cable Protection Committee (2014a). ICPC Recommendation #3, Criteria to be Applied to Proposed Crossings of Submarine Cables and/or Pipelines, Issue 10A, 12 February 2014.
International Cable Protection Committee (2015). ICPC Recommendation #2, Recommended Routeing and Reporting Criteria for Cables in Proximity to Others, Issue 11, 3 November 2015
Marine Management Organisation (MMO) (2014) East Inshore and East Offshore Marine Plans
Oil and Gas Authority (2018) Interactive maps and tools. Available at https://www.ogauthority.co.uk/data-centre/interactive-maps-and-tools/
Planning Inspectorate (2018). Advice Note Nine: The Rochdale Envelope
Planning Inspectorate (2021) Scoping Opinion: Proposed North Falls Offshore Wind Farm. Case reference: EN010119