



**RWE Renewables UK Dogger Bank
South (West) Limited**

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Dogger Bank South Offshore Wind Farms

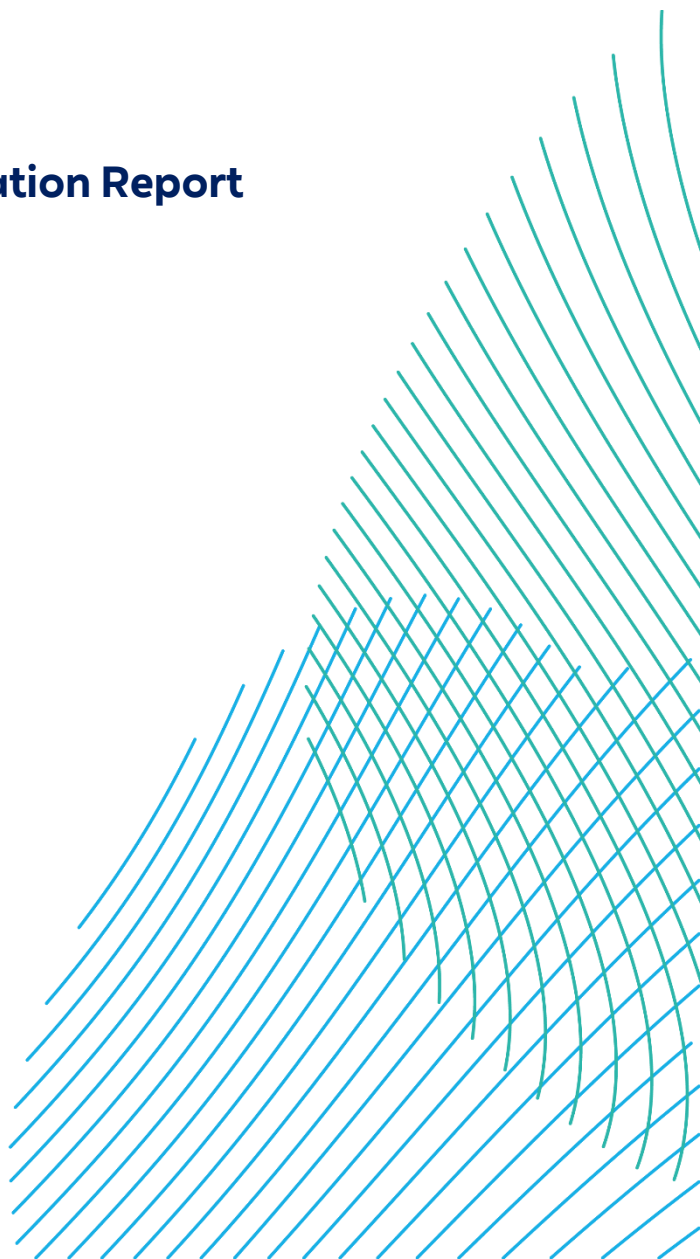
**Preliminary Environmental Information Report
Chapter 6 – EIA Methodology**

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Glossary

Term	Definition
Dogger Bank South (DBS) offshore wind farms	The collective name for the two Projects, DBS East and DBS West.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA) for certain topics.
Impact	Used to describe a change resulting from an activity via the Projects, i.e. increased suspended sediments / increased noise.
Effect	The consequences of an impact combining with a receptor, defined in terms of significance (significance being dependent on magnitude of impact x sensitivity / value / importance of receptor).
Scoping Opinion	The report adopted by the Planning Inspectorate on behalf of the Secretary of State.
Scoping Report	The report that was produced in order to request a Scoping Opinion from the Secretary of State.
Topic Specific Study Area	The area where potential impacts from the Projects could occur, as defined for each individual EIA topic.
The Applicant	RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited as the owners of DBS West and DBS East respectively are the named undertakers that will have the benefit of the Development Consent Order. References in this document to obligations on, or commitments by, 'the Applicant' are given on behalf of RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited.

Term	Definition
The Projects	DBS East and DBS West (collectively referred to as the Dogger Bank South offshore wind farms).

Acronyms

Term	Definition
BEIS	Business, Energy and Industrial Strategy
CEA	Cumulative Effects Assessment
DCO	Development Consent Order
DBS	Dogger Bank South
EIA	Environmental Impact Assessment
ES	Environmental Statement
EEA	European Economic Area
EU	European Union
EPP	Evidence Plan Process
ICES	International Council for the Exploration of the Seas
IEMA	Institute of Environmental Management and Assessment
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
PEI	Preliminary Environmental Information
PEIR	Preliminary Environmental Information Report
SCADA	Supervisory Control and Data Acquisition
UK	United Kingdom
UNECE	United Nations Economic Commission for Europe

6 EIA Methodology

6.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) describes the methodology and approach applied to the Environmental Impact Assessment (EIA) for the proposed Dogger Bank South (DBS) East and DBS West offshore wind farms ('the Projects'), which are collectively known as DBS offshore wind farms. The Projects are being developed in parallel and are subject to a single development consent order (DCO) application.
2. Whilst DBS East and DBS West are the subject of a single DCO application (with a combined EIA process and associated submissions), each Project is assessed individually so that mitigation is Project specific (where appropriate). As such, the assessments cover the possibility that DBS East or DBS West are developed in isolation, as well as both DBS East and DBS West being developed, either concurrently or sequentially.
3. The EIA considers all relevant topics covered under the following three general areas:
 - Offshore environment;
 - Onshore environment; and
 - Wider environment.
4. The EIA has been carried out in accordance with the Planning Act 2008 and the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) (see section 6.2 and **Chapter 3 Policy and Legislative Context**).

5. The approach to the EIA also closely follows relevant guidance including:
 - Planning Inspectorate Advice Notes (see **Table 6-1**);
 - Overarching National Policy Statements (NPS) for Energy EN-1, Renewable Energy Infrastructure EN-3 and Electricity Networks Infrastructure EN-5 (Department of Energy and Climate Change, 2011a, 2011b, 2011c);
 - It is noted that NPS EN-1, EN-3 and EN-5 are in the process of being revised. A draft version of each NPS was published for consultation in September 2021 (Department for Business, Energy and Industrial Strategy (BEIS), 2021). A review of the draft versions has been undertaken in the context of this and topic-specific chapters;
 - Assessment of the Environmental Impact of Offshore Wind Farms (OSPAR Commission, 2008);
 - Relevant guidance issued by other government and non-governmental organisations;
 - Technical chapter-specific guidance documents; and
 - Receptor-specific guidance documents.
6. This PEIR also gives due regard to the requirements of the Conservation of Habitats and Species Regulations 2017 and Conservation of Offshore Marine Habitats and Species Regulations 2017, and the Marine and Coastal Access Act 2009.

6.2 Requirement for EIA

7. The EIA framework is set out within European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the EIA Directive). The EIA Directive is transposed into English law for Nationally Significant Infrastructure Projects (NSIPs) by the EIA Regulations, which set out the requirements for EIA. The EIA process includes the collation of data required to identify and assess the potential impacts of a development, the identification of any significant adverse effects and any measures to avoid, prevent or reduce and, if necessary, offset such impacts.
8. The primary objective of an EIA, as described in Article 2 of the EIA Directive, is that “*Member States shall adopt all measures necessary to ensure that, before development consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects on the environment*”. In addition, the EIA provides the public with early and effective opportunities to participate in the decision-making process.
9. The preliminary findings for this EIA are presented within this PEIR to support consultation under sections 42 and 47 and publication under section 48 of the Planning Act 2008 and meet the requirements of Regulation 12 of the EIA Regulations. The applicant will have regard to feedback from the consultation and where appropriate use it to inform the ongoing design and Rochdale Envelope (section 6.6.3), upon which the impact assessment of the Projects will be based. This will be set out within the Environmental Statement (ES), which will be submitted to the Planning Inspectorate as part of the DCO application.
10. For EIA development, Regulation 12 of the EIA Regulations requires an applicant to compile preliminary environmental information (PEI) to publicise and consult on. Such PEI must allow for consultees “*to develop an informed view of the likely significant environmental effects of the development (and of any associated development)*”.
11. The purpose of this PEIR is therefore to inform consultees, stakeholders and the public of the likely significant effects that would result from the Projects during their construction, operation, maintenance and (where relevant) decommissioning, based on the level of design information currently known.

6.3 Approach and Methodology

12. The approach to the EIA closely follows several relevant overarching guidance notes, policy statements, and industry best practice documents as set out in **Table 6-1**. Where additional topic-specific assessment guidance is available, this is detailed within the corresponding chapter of this PEIR. Furthermore, **Chapter 3 Policy and Legislative Context** presents the relevant policies and legislation applicable to the Projects.

Table 6-1 Documents Used to Guide the EIA Methodology

Document
Planning Inspectorate Advice Notes
Advice Note Three: EIA Consultation and Notification (Planning Inspectorate, 2017a)
Advice Note Six: Preparation and submission of application documents (Planning Inspectorate, 2021a)
Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (Planning Inspectorate, 2020a)
Advice Note Nine: Rochdale Envelope (Planning Inspectorate, 2018)
Advice Note Ten: Habitat Regulations Assessment relevant to nationally significant infrastructure projects (Planning Inspectorate, 2022a)
Advice Note Eleven: Working with public bodies in the infrastructure planning process (Planning Inspectorate, 2017b)
Advice Note Twelve: Transboundary Impacts and Process (Planning Inspectorate, 2020b)
Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (Planning Inspectorate, 2019)
Advice Note Eighteen: The Water Framework Directive (Planning Inspectorate, 2017c)
National Policy Statements
Overarching National Policy Statement for Energy (EN-1) (DECC, 2011a)
National Policy Statement for Renewable Energy Infrastructure (EN-3) (DECC, 2011b)
National Policy Statement for Electricity Networks Infrastructure (EN-5) (DECC, 2011c)

Document
Draft National Policy Statements
Draft Overarching National Policy Statement for Energy (EN-1) (BEIS, 2021a)
Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) (BEIS, 2021b)
Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (BEIS, 2021c)
Industry EIA Guidance Documents
Assessment of the Environmental Impact of Offshore Wind-farms (OSPAR Commission, 2008)
Offshore Wind Farms: Guidance Note for Environmental Impact Assessment in Respect of Food and Environment Protection Act 1985 and Coastal Protection Act 1949 requirements (Cefas, 2004)
Cumulative Impact Assessment Guidelines - Guiding Principles For Cumulative Impact Assessment in Offshore Wind Farms (RenewableUK, 2013)
Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects (Cefas, 2012)
Professional EIA Guidance Documents
Guidelines for Environmental Impact Assessment (IEMA, 2004)
Guide to Shaping Quality Development (IEMA, 2016)
Delivering Proportionate EIA, A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice (IEMA, 2017)

6.4 Competent Experts

13. As per Regulation 14(4) of the EIA Regulations, the EIA must be prepared by 'competent experts' with details of that competency (including relevant expertise and qualifications of such experts) provided within the associated ES.
14. Royal HaskoningDHV has provided environmental, development and consenting support on over 14GW of renewable energy projects across 26 UK offshore wind farms. Their EIA activities and ESs are accredited by the Institute of Environmental Management and Assessment (IEMA) under the EIA Quality Mark Scheme. This demonstrates Royal HaskoningDHV's commitment to ensuring EIA is undertaken at a high quality and in accordance with best practice.
15. Royal HaskoningDHV's lead authors are senior and chartered professionals with a significant track record in undertaking technical assessment and EIA in their discipline. The team undertaking the EIA for the Projects are predominantly Royal HaskoningDHV professional consultants. The team is comprised of a dedicated core team of EIA professionals who coordinate and manage the EIA. The core team is supported by a wider team of technical specialists who take responsibility for the data collection, data analysis and technical impact assessment.
16. Some of the technical assessment and associated chapters have been undertaken by specialist consultancies outside Royal HaskoningDHV (**Table 6-2**).

Table 6-2 Third Party Specialist PEIR Chapter Authors

Chapter	Consultancy	Competency
Fish and Shellfish Ecology	MarineSpace	MarineSpace has extensive experience in providing support to clients aiming to develop projects in the marine environment, including across several UK offshore wind farms.
Commercial Fisheries		
Offshore Ornithology	MacArthur Green	MacArthur Green provides expert advice in relation to marine and terrestrial ornithology.
Shipping and Navigation	Anatec	Anatec has extensive experience of carrying out shipping and navigation assessments for offshore renewables projects as well as other marine developments in the UK and Worldwide.
Aviation and Radar	Cyrrus	Cyrrus Limited has extensive experience in the aviation and renewable energy industries, working with airports across Europe and the Middle East, and wind energy developers in the UK and the Republic of Ireland.
Terrestrial Ecology	Ecus	Ecus are a multi-disciplinary environmental consultancy offering environmental and management services and expertise.
Landscape and Visual Impact	LUC	LUC is a planning, impact assessment, landscape design, ecology and geospatial consultancy with expertise across a broad cross-section of environmental disciplines.

Chapter	Consultancy	Competency
Noise	SV Acoustics	SV Acoustics provide expert knowledge in acoustics noise and vibration, including the planning and regulatory framework.
Human Health	RPS	RPS is an internationally recognised and leading health impact assessment (HIA) service provider with a catalogue of project experience encompassing road, rail and airport infrastructure, waste management, grid connections, windfarms, and oil and gas projects.
Socio-Economics	BiGGAR economics	BiGGAR Economics is a leading independent economic consultancy providing economic analysis and advice across a range of projects.
Tourism and Recreation		

6.5 Consultation

17. As discussed in **Chapter 7 Consultation**, the EIA methodology has been informed by a Scoping Opinion that was provided by the Planning Inspectorate in September 2022 (Planning Inspectorate, 2022b).
18. In addition, ongoing technical consultation (e.g. via the Evidence Plan Process (EPP)) has informed the methodology for the EIA, including via written exchange on method statements for most topics. Each technical chapter (**Chapters 8 to 30**) provides details of the feedback received on each topic.
19. **Table 6-3** provides a summary of how the consultation responses received to date have influenced the approach that has been taken.

Table 6-3 Consultation Responses

Comment	Project Response
The Planning Inspectorate, Scoping Opinion, September 2022	
The ES should clearly explain which other developments will be assumed to be under construction or operational as part of the assessment of the future baseline, with and without the Projects.	Each chapter identifies the potential future baseline. The Cumulative Effect Assessment identifies those projects that may be under construction or operation at the same time as the Projects.
It is noted that Paragraph 126 states ‘Only projects which are reasonably well defined and sufficiently advanced to provide information on which to base a meaningful and robust assessment will be included in the CIA. Where possible RWE Renewables will use as-built project parameter information (if available) as opposed to consented parameters to reduce over-precaution (inaccuracies) in the cumulative assessment’. The Inspectorate advises that where projects are not fully defined, the worst-case scenario available should be used in the assessment. The parameters applied in relation to existing projects should also represent the worst-case, taking into account the circumstances around what is legally secured for those projects. The level of precaution associated with the outcomes of the cumulative assessment should be explained in the ES. The Inspectorate does not agree that a high degree of precaution is equitable to inaccuracies in an assessment. In general, the description of the approach to the cumulative impact assessment within each aspect chapter of the Scoping	Worst-case scenarios will be used in the CEA for other projects that are not fully defined, as well as other existing projects. The ES will specifically identify how impacts could combine and assess their significance. See also section 6.7.4.

Comment	Project Response
Report is very limited. The Inspectorate expects the ES to specifically identify how impacts could combine and to provide an assessment of their significance, in accordance with the advice in the Inspectorate's National Infrastructure Advice Note 17.	
Paragraph 132 states that transboundary effects are not expected to be relevant to onshore aspects. The Scoping Report identifies potential transboundary effects in relation to: Marine Mammals (Section 2.7); Offshore Ornithology (Section 2.8); Commercial Fisheries (Section 2.9); Shipping and Navigation (Section 2.10); and Aviation and Radar (Section 2.11). The Inspectorate has noted where the Applicant has requested to scope out transboundary effects on aspects/matters in the EIA and is in broad agreement with the potential transboundary effects identified. The Inspectorate notes that it has an ongoing duty in relation to consideration of transboundary effects and will undertake a separate transboundary screening exercise on behalf of the SoS under Regulation 32 of the EIA Regulations following the adoption of the Scoping Opinion. The Inspectorate recommends that where Regulation 32 applies, the ES should identify whether the Proposed Development has the potential for significant transboundary effects and if so, what these are and which European	Noted, and the PEIR chapters identify where there may be transboundary effects. See also section 6.7.5.

Comment	Project Response
Economic Area (EEA) States would be affected.	
Paragraph 142-143 discuss the relevant legislation for EIA with reference to the 2011 Regulations. For clarity, the ES should be prepared in line with the Infrastructure Planning (EIA) Regulations 2017.	Noted and correct reference applied. See also Section 6.1.
In several aspect chapters within the Scoping Report, the relevant onshore and offshore study areas are not defined or represented on the figures provided. The ES should provide a detailed justification of the study areas applied, supported by evidence of the likely geographical extent of the impacts identified from the Proposed Development.	Noted. The PEIR and ES will provide detailed justification, with evidence and figures, of the study areas and their geographical extent.
The Scoping Report (Paragraph 340) indicates that data collected for the Dogger Bank Creyke Beck, and Dogger Bank Teesside Projects will be utilised to inform the ES where appropriate. The ES should utilise the most recently available representative datasets at the time of production. The Inspectorate expects the ES to include a chapter setting out the overarching methodology for the assessment, which clearly distinguishes effects that are 'significant' from 'non-significant' effects. Whilst it is noted that paragraph 119 states that moderate or major effects are considered as significant, any departure from that methodology should be described in individual aspect assessment chapters. Where site specific surveys or	Noted and the EIA will use the most recently available datasets that are available at the time of production. For the approach to the EIA including impact assessment see Section 6.7. Any site-specific surveys will have full methodologies and any limitations included and agreed with relevant stakeholders (Section 6.7.1.2).

Comment	Project Response
investigations are proposed, the ES should set out the methodologies used and to what extent these have been agreed with relevant stakeholders. The ES should include details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	
Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should also address how any mitigation proposed is secured, with reference to specific DCO requirements or other legally binding agreements. The ES should identify and describe any proposed monitoring of significant adverse effects and how the results of such monitoring would be utilised to inform any necessary remedial actions.	Any proposed mitigation will be fully explained in the ES. In reference to how the mitigation reduces potential impacts, a justified residual impact after mitigation will be provided. See also Section 6.6.4.

6.6 Scope

6.6.1 Proportionate EIA

20. Over time, EIA practice has become more complex and has resulted in larger volumes of information that consider every conceivable impact, rather than focusing on the impacts that are considered to result in likely significant effects, which is the ultimate requirement of the EIA Directive and the EIA Regulations. As a result, many EIAs have become unfocused, with their key findings becoming diluted or unclear. As noted by IEMA in its 2017 report (IEMA, 2017), the need for delivering proportionate EIA is a key issue for the UK planning and consenting system for regulators and developers alike.

21. IEMA noted “... *the drive for improved quality in EIA, combined with the UK’s evidence-based and precautionary approach, has led to substantial challenges for the future of the practice. The increased complexity of multi-faceted decisions and the wider range of stakeholders who seek transparency and clear audit trails has further compounded the problems. The combined impact of the above good intentions has often led to individual EIAs being too broadly scoped and their related ESs to be overly long and cumbersome.*”
22. An unwieldy or disproportionate EIA can make understanding the key environmental impacts of a proposed development difficult and can make the findings inaccessible to decision-makers and the public, creating confusion and potentially adding undue delay.
23. Additionally, PINS Advice Note Six: Preparation and Submission of Application Documents (PINS, 2020a) encourages applicants to think about the size of documents submitted with duplication and superfluous content discouraged. ESs are welcomed that are proportionate to the scale and complexity of the EIA undertaken, although it is appreciated that for NSIPs, such documentation will comprise several volumes.
24. The Planning Inspectorate’s Advice Note 7: Environmental Impact Assessment states concerning the preliminary assessment “*There is no prescribed format as to what PEI should comprise and it is not expected to replicate or be a draft of the ES. However, if the Applicant considers this to be appropriate (and more cost-effective) it can be presented in this way. A good PEI document is one that enables consultees (both specialist and non-specialist) to understand the likely environmental effects of the Proposed Development and helps to inform their consultation responses on the Proposed Development during the pre-application stage*”.
25. This is supported by the Department of Communities and Local Government’s (DCLG) Planning Act 2008: pre-application guidance “*The preliminary environmental information is not expected to replicate or be a draft of the environmental statement.*” (DCLG, 2008).

6.6.2 Topic-Specific Study Areas

26. Topic Specific Study Areas have been defined at the relevant scale and are described within the relevant topic chapters. These have been determined by a number of factors such as the distribution of receptors, footprint of potential impact and administrative / management boundaries (e.g. territorial waters, International Council for the Exploration of the Seas (ICES) rectangles). Where possible, these have been agreed upon with regulators or advisors.

6.6.3 Project Design Envelope

27. The EIA for the Projects is based on a project design envelope (or ‘Rochdale Envelope’) approach on a topic-by-topic basis. As is recognised by the Planning Inspectorate in Advice Note Nine (Planning Inspectorate, 2018), at the time of submitting an application, offshore wind developers may not know the precise nature and arrangement of infrastructure and associated infrastructure that make up the Projects. This is due to a number of factors such as the evolution of technology and the need for further detailed surveys before a final design and layout can be determined. This flexibility is important as it prevents consent from being granted for specific infrastructure or a particular layout which is not possible or optimal by the time of construction, which may be several years after the granting of the DCO.
28. The general principle of the assessment, under the project design envelope approach, is that for each receptor and potential impact, the impact assessment will be based on assessing project design parameters likely to result in the maximum adverse effect (i.e. the worst-case scenario). 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 a less significant effect.
29. If a combination of design parameters leads to a scenario that cannot realistically occur, then the worst-case scenario will be reconsidered, and a realistic set of worst-case parameters will be assessed. The end result will be an EIA based on clearly defined environmental parameters that will define the range of development possibilities and hence the likely significant environmental effects that could result from the Projects. This represents a precautionary but robust assessment of likely significant effects at this stage of the development process.
30. Using the project design envelope approach means that receptor-specific likely significant effects draw on the options from within the wider envelope that represent the most realistic worst-case scenario. It is also worth noting that under this approach the combination of project options constituting the realistic worst-case scenario may differ from one receptor to another and from one impact to another.
31. In accordance with this approach, the realistic worst-case scenarios for each topic are summarised within each topic chapter. These are based on the design parameters described in **Chapter 5 Project Description**, which provides further details regarding specific activities and their durations.

6.6.4 Mitigation

32. For the purposes of the PEIR, two types of mitigation have been defined:
- **Embedded mitigation:** measures that are identified and adopted as part of the design evolution of the Projects, and are included and assessed in the EIA; and
 - **Additional mitigation:** measures that are identified during the EIA process specifically to reduce or eliminate any predicted likely significant effects. Additional mitigation is therefore subsequently adopted as a commitment of the Projects.
33. Embedded mitigation which has been agreed upon at this stage is set out within **Chapter 5 Project Description** and outlined where relevant within each topic chapter of the PEIR.
34. Where an impact assessment predicts that an aspect of the Projects will give rise to likely significant effects, additional mitigation measures are considered and discussed with statutory and non-statutory consultees in order to avoid impacts or reduce them to acceptable levels.

6.7 Approach to EIA

35. Undertaking an EIA relies on a series of steps to identify a potential impact and arrive at a conclusion of the likely significance of effect for each potential impact identified. The process involves the following steps:
- Characterise the existing environment (environmental baseline) with respect to each topic area;
 - Assess the likely significant environmental effects of the Projects by:
 - Identifying the source of potential impacts (e.g. specific construction activities or design features);
 - Establishing if a pathway exists between the source of the impact and the identified receptors (e.g. airborne, waterborne or subterranean);
 - Identify the sensitivity of each receptor to the relevant impacts;
 - Identify the magnitude of the impact predicted; and
 - Considering the receptor sensitivity and likely impact magnitude, in order to assess the likely significance of effect for the potential impact.
 - Assess the potential for the likely significant effects of the Projects to act cumulatively with the effects of other plans and projects:
 - In the UK (Cumulative Effects Assessment (CEA)); and
 - Internationally (transboundary effects assessment).
36. The following sections provide further details on the above steps.

6.7.1 Characterisation of the Existing Environment (Environmental Baseline)

37. In order to undertake an assessment of likely significant effects, an understanding of the current condition of the environmental baseline is required. For each topic, a review of the existing environment has been undertaken in order to determine the existing environmental conditions relevant to the Projects.
38. Characterisation of the environmental baseline for each topic followed the steps listed below with the details provided in each of the respective technical chapters:
- Review of available information and data (either through a desk-based exercise and/or survey data where necessary);
 - Determine if sufficient data is available to assess the significance of likely environmental effects that might be expected to arise from the Projects with sufficient confidence;
 - If further data is required, ensure data gathered addresses key data gaps;
 - Review information gathered to ensure the environment can be characterised in sufficient detail; and
 - Identify the presence of relevant receptors with respect to each topic.
39. The specific approach to establishing the characteristics of the existing environment (upon which likely significant effects can be assessed) is set out in each technical chapter of this PEIR. This approach has taken into account feedback in the Scoping Opinion (Planning Inspectorate, 2022b) alongside consultation with a range of statutory and non-statutory stakeholders.
40. As this is a preliminary assessment, not all of the steps outlined above have been completed for all topics. Where additional data is required, surveys may still be ongoing for certain topics. In these cases the full survey results will be included in the final ES. Consultation will continue between PEIR and DCO submission via the ETGs to discuss final survey results and any updated assessments.

6.7.1.1 Future Trends

41. In addition to characterising the existing environment, anticipated trends in baseline conditions are identified and incorporated in the impact assessments, for example, the likely significant effects of climate change on receptors, in accordance with the requirements of the EIA Regulations.
42. The EIA Regulations require an outline of the expected evolution of the baseline, in the absence of the Projects being developed (as far as this can be assessed 'with reasonable effort' based on available information and scientific knowledge). Each topic chapter presents the anticipated trend of the existing environment over the anticipated timescales of the Project's construction and operational lifespan. Such trends reflect natural changes in the baseline environment that may be expected to occur without development.

6.7.1.2 Confidence and Limitations

43. Limitations to characterising the baseline environment (e.g. data coverage and confidence) are noted within each topic chapter. Where it is possible to do so, such limitations will be addressed within the ES submitted with the DCO application. Addressing such limitations may be achieved through continued consultation with stakeholders and / or further survey efforts where appropriate and proportionate. The extents to which certain limitations may materially influence the outcome of the EIA are highlighted within the respective topic chapters.

6.7.2 Assessment of Likely Significant Effects

44. The approach to making balanced assessments for the Projects has been guided by the professional judgement of a team of technical specialists using existing and new data, drawing on extensive prior experience. In order to provide a consistent framework and system of common tools and terms, a matrix approach has been used to frame and present the expert judgements made. For each topic, definitions of sensitivity and magnitude of impact are specific to each receptor (see section 6.7.3.2 and section 6.7.3.3). These definitions are detailed fully in each topic chapter.

6.7.3 Impact Identification

45. The impact assessment considers the potential for impacts during the construction, operation and maintenance, and decommissioning phases of the Projects. Potential impacts may be classified as follows:
- Direct impacts: these may arise from impacts associated with the construction, operation and maintenance, or decommissioning of the Projects;
 - Indirect impacts: these may be experienced by a receptor that is removed (e.g., in space or time) from the direct impact (e.g. noise impacts upon fish which are a prey resource for fish or mammals);
 - Inter-relationships between environmental topic areas (see section 6.7.3.5);
 - Interactions between impacts, whereby the same receptor or receptor group is affected by multiple impacts acting together (see section 6.7.3.6); or
 - Cumulative impacts: these may occur as a result of the Projects in conjunction with other existing or planned projects within the study area for each receptor (see section 6.7.4).

6.7.3.1 Impact Pathway

46. The assessment will use the conceptual ‘source-pathway-receptor’ model. The model identifies potential impacts resulting from the proposed activities on the environment and sensitive receptors within it. This process provides an easy to follow but robust assessment route between impact sources and potentially sensitive receptors ensuring a transparent impact assessment.
47. The aspects of this model are defined as follows:
- **Source** – the origin of a potential impact (i.e., an activity such as cable installation and a resultant effect e.g., re-suspension of sediments);
 - **Pathway** – the means by which the effect of the activity could impact a receptor (e.g., for the example above, re-suspended sediment could settle and smother seabed); and
 - **Receptor** – the element of the receiving environment that is impacted (this could either be a component of the physical, ecological or human environment such as water quality or benthic habitat, e.g., for the above example, species living on or in the seabed).

48. In general, the impact assessment for each topic will use this model when considering the potential impacts arising during the construction, operation and maintenance and decommissioning phases of the Projects. In some cases, it is appropriate to use other models for assessment, for example for the shipping and navigation assessment where a risk assessment approach is required instead.

6.7.3.2 Receptor Sensitivity

49. As discussed in section 44, each topic chapter identifies the relevant receptors within the associated study area which may experience potential direct or indirect effects as a result of the construction, operation, maintenance or decommissioning of the Projects. Identification of the receptors has been aided through engagement with stakeholders, both statutory and non-statutory as discussed in **Chapter 7 Consultation**.
50. Once identified, receptors have been assigned a level of sensitivity proportionate to their vulnerability to each relevant impact. The overall receptor sensitivity is determined by considering a combination of adaptability, tolerance and recoverability. This is achieved through applying known research and information on the status and sensitivity of the feature under consideration coupled with professional judgement and past experience.
51. Example definitions of the different sensitivity levels for a generic receptor are given in **Table 6-4**. It should be noted that the definitions of sensitivity are not constant across all topic areas, and specific references to the definitions of sensitivity for the topic-relevant receptors are provided within each topic chapter.

Table 6-4 Example Definitions of Sensitivity Levels for a Generic Receptor

Sensitivity	Definition
High	Individual receptor has very limited or no capacity to avoid, adapt to, accommodate or recover from the anticipated impact.
Medium	Individual receptor has limited capacity to avoid, adapt to, accommodate or recover from the anticipated impact.
Low	Individual receptor has some tolerance to accommodate, adapt or recover from the anticipated impact.
Negligible	Individual receptor is generally tolerant to and can accommodate or recover from the anticipated impact.

52. In addition, the receptor value is considered as a factor in the expert judgement conclusions in the impact assessment. For example, whether the receptor is rare, has protected or threatened status, has importance at a local, regional, national, or international scale, and in the case of biological receptors whether the receptor has a key role in the ecosystem function. An example definition for each value level which could be attributed to a generic receptor is given in **Table 6-5**.

Table 6-5 Example Definitions of Value Levels for a Generic Receptor

Value	Definition
High	Internationally / nationally important (for example internationally or nationally protected site).
Medium	Regionally important / regionally protected site.
Low	Locally important / rare but with high potential for mitigation.

Value	Definition
Negligible	Not considered to be important (for example common or widespread).

53. The terms 'high value' and 'high sensitivity' are not necessarily linked within a particular impact, and it is important not to inflate impact significance specifically because a feature is valued.
54. Expert judgement is particularly important when determining the sensitivity of receptors. For example, an Annex II priority species (under the Habitats Directive) would have a high inherent value but may be tolerant to an impact or have high recoverability. In this case, sensitivity should reflect the ecological robustness of the species and not necessarily default to its protected status.

6.7.3.3 Assessment of Impact Magnitude

55. In order to predict the significance of effect, it is important to establish the magnitude and probability of an impact occurring through a consideration of:
 - Scale or spatial extent (small scale to large scale or most of the population or a few individuals;
 - Duration (short term to long term);
 - Likelihood of impact occurring;
 - Frequency; and
 - Nature of change relative to the baseline.
56. Definitions of magnitude are topic specific and are provided in each topic chapter. Examples are provided in **Table 6-6**.

Table 6-6 Example Definitions of Magnitude Levels for a Generic Receptor

Magnitude	Definition
High	Fundamental, permanent / irreversible changes over the whole receptor, and / or fundamental alteration to key characteristics or features of the particular receptor's character or distinctiveness.
Medium	Considerable, permanent / irreversible changes over the majority of the receptor, and / or discernible alteration to key characteristics or features of the particular receptor's character or distinctiveness.
Low	Discernible, temporary (throughout project duration) change over a minority of the receptor, and / or limited but discernible alteration to key characteristics or features of the particular receptor's character or distinctiveness.
Negligible	Discernible, temporary (for part of the project duration) change, or barely discernible change for any length of time, over a small area of the receptor, and/or slight alteration to key characteristics or features of the particular receptor's character or distinctiveness.

6.7.3.4 Assessment of Significance

57. The significance of effect is evaluated with reference to definitive standards, accepted criteria, technical guidance or legislation where these exist, for each topic. Where it is not possible to quantify impacts, and where a qualitative or semi-qualitative assessment is made, a reasoned framework for the assessment is provided.
58. Where guidance is available for defining sensitivity and magnitude (whether from professional guidance, UK Government publications or bespoke definitions agreed with stakeholders) this is referred to. If such sources are available but have not been used, the reason for the approach taken is given.

59. The assessment of effect significance is a function of the sensitivity of the receptor (see section 6.7.3.2) and the magnitude of the impact (see section 6.7.3.3). The determination of significance is guided by the use of a significance of effect matrix (**Table 6-7**).
60. Definitions of each level of significance are provided in each topic chapter and examples are provided in **Table 6-8**.

Table 6-7 Significance of Effect Matrix

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

Table 6-8 Example Definitions 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 national or population level because they contribute to achieving national 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 regional level.
Minor	Small change in receptor condition, which may be raised as localised issues but are unlikely to be important in the decision-making process.
Negligible	No discernible change in receptor condition.

61. Potential effects identified as major or moderate are regarded within the PEIR as 'significant' in EIA terms. During the assessment, if there is any deviation from the stated definition of 'significant', this will be described and justified in the relevant topic chapter. As discussed in section 6.6.4, mitigation is identified where possible to avoid or reduce likely significant effects, and a residual significance of effect is included where mitigation is applied or required.

6.7.3.5 Inter-relationships

62. The impact assessment also considers the inter-relationship of effects on individual receptors. For example, a landscape and visual effect and noise effect may result in a cumulative effect on a single receptor; or the effects on fish and shellfish inter-relate with the effects of changes to prey resource for marine mammals and ornithology. This has been covered within each technical chapter in the inter-relationship section.

6.7.3.6 Interactions

63. The effects identified and assessed for each topic have the potential to interact with each other, which could give rise to synergistic effects as a result of that interaction. The areas of interaction between effects are presented in each chapter, along with an indication as to whether the interaction may give rise to synergistic effects. This provides a screening tool for which effects have the potential to interact. There is then an assessment for each receptor (or receptor group) related to these effects in two ways. Firstly, the effects are considered within a development phase (i.e. construction, operation or decommissioning) to see if, for example, multiple construction effects could combine. Secondly, a lifetime assessment is undertaken which considers the potential for effects on receptors across development phases.

6.7.4 Cumulative Effects Assessment Methodology

64. This section presents the overall approach that is being used in the PEIR to undertake an assessment of cumulative effects and provides a short preliminary review of the main plans, programmes and projects which, together with the DBS East and/or DBS West proposals, have the potential for significant cumulative effects.

6.7.4.1 Background to Consideration of Cumulative Effects

65. Schedule 4 of the Town and Country Planning Environmental Impact Assessment Regulations 2017 (SI No. 572) (Ref. 13.1) states that the Environmental Statement (ES) should include:
- “A description of the likely significant effects of the development on the environment resulting from, inter alia....*
66. *The cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources”* and
67. *“The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.”*
68. As noted in paragraph 24, there is no prescribed way of undertaking a PEIR. However, for the purpose of the PEIR for DBS offshore wind farms and the ongoing EIA, the term ‘cumulative’ effects is used. These arise when impacts from the Projects combine with impacts from other planned/potential third-party plans or projects (normally in the vicinity of the site), resulting in a change to the overall magnitude of impact acting on a receptor and potentially a change in the resulting effect.

6.7.4.2 Approach to Assessment of Cumulative Effects

69. Where the impacts from the development of DBS East and/or DBS West could combine with an impact from a third-party project, plan and/or programme, it may have the potential to result in a cumulative effect on a given receptor. The broad approach used within the EIA for the Projects to consider cumulative impacts is shown below:
- **Stage 1** - Define the reasonable maximum spatial area over which the Proposed Development can exert an influence (i.e. the Zone of Influence (ZOI) and identity a longlist of 'other development'.
 - **Stage 2** - Identify a shortlist of 'other development' based on a set of inclusion/exclusion criteria applied to the longlist.
 - **Stage 3** - Gather information in relation to the short-listed development, including the location of these within the ZOI, and provide adequate information in order to consider whether there is potential for cumulative effects.
 - **Stage 4** - Undertake the cumulative effects assessment.
70. The Planning Inspectorate Advice Note Nine and its complementary guidance in Advice Note Seventeen (Planning Inspectorate, 2018a; Planning Inspectorate, 2015) advise that the following plans and projects should be considered in the CEA:
- Under construction;
 - Permitted application(s), but not yet implemented (provided they are still within the allowed implementation period);
 - Submitted application(s) not yet determined (as above);
 - Refused but subject to appeal procedures not yet determined;
 - On the National Infrastructure Planning Programme of projects;
 - Identified in the relevant development plan (and emerging development plans - with appropriate weight being given as they move closer to adoption) recognising that information on any relevant proposals will be limited; and
 - Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.
71. 'Tiers' of these other projects' statuses have been defined as well as the availability of information to be used within the CEA. This approach is based on the three-tier system proposed in Planning Inspectorate Advice Note

Seventeen. Where advised by Natural England, a more refined tiering system based on the guidance issued by Natural England and Defra (2013) is employed and involves seven tiers as presented below:

- Tier 1: built and operational projects where they have not been included within the environmental characterisation survey i.e. they were not operational when baseline surveys were undertaken, and/or any residual effect may not have yet fed through to and been captured in estimates of baseline conditions, such as background distribution or mortality rate for birds;
- Tier 2: projects under construction plus Tier 1 projects;
- Tier 3: projects that have been consented (but construction has not yet commenced) plus Tiers 1 and 2;
- Tier 4: projects that have an application submitted to the appropriate regulatory body that have not yet been determined, plus Tiers 1-3;
- Tier 5: projects that have produced a PEIR and have characterisation data within the public domain, plus Tiers 1-4;
- Tier 6: projects that the regulatory body are expecting to be submitted for determination (e.g. projects listed under the Planning Inspectorate programme of projects), plus Tiers 1-5; and
- Tier 7: projects that have been identified in relevant strategic plans or programmes plus Tiers 1-6.

72. The CEA is a two-part process in which an initial list of projects with the potential to interact with the Projects is identified, based on the potential mechanism of interaction. The tiered approach is then adopted to enable further assessment based on the availability of information for each project. In line with the RenewableUK CEA guidelines for offshore wind farms (RenewableUK, 2013), the approach to CEA attempts to incorporate an appropriate level of pragmatism. This is demonstrated in the confidence levels applied to the understanding of other projects (either their design or their likely significant effects), particularly those that are known but currently lack detailed design documentation, such as those projects at the scoping stage only. Projects can be considered in the CEA only where it is considered that there is sufficient detail with which to undertake a meaningful assessment. Where there is a lack of specific information in the public domain, such as how and when (or if) projects will be built, it is not always possible to undertake a meaningful CEA. As in **Table 6-3**, worst-case scenarios will be used in the CEA for other projects that are not fully defined, as well as other existing projects.

73. Those projects which were operational at the time of undertaking the characterisation of the existing environment for the Projects is considered as part of the baseline for the EIA. This is in line with Advice Note Seventeen (Planning Inspectorate, 2019).
74. The process for assessing the cumulative effects in the EIA will follow the same methodology and assessment criteria for each topic chapter. Similarly, the CEA will be reported on within the ES following the same significance criteria as for the main assessment. Should a cumulative effect be determined as significant, then mitigation will need to be fully considered. For each topic chapter, screening for cumulative effects will be presented in a table format based on the following headings:
- Impact;
 - Potential for Cumulative Impact;
 - Data Confidence (may only be relevant for certain chapters); and
 - Rationale.
75. Offshore cumulative effects may arise from interactions with the following activities and industries (but are not limited to):
- Other offshore wind farms;
 - Aggregate extraction and dredging;
 - Licensed disposal sites;
 - Sub-sea cables and pipelines;
 - Potential port/harbour development; and
 - Oil and gas activities.
76. Onshore plans or projects to be taken into consideration include (but are not limited to):
- Other energy generation or transmission infrastructure;
 - Building/housing developments;
 - Installation or upgrade of roads;
 - Installation or upgrade of cables and pipelines;
 - Coastal protection works; and
 - National Grid works.
77. The assessment of cumulative effects will be undertaken in accordance with the methodology defined above.

6.7.4.3 Preliminary Assessment of Cumulative Effects

78. The CEA that is presented as part of this PEIR reflects the information, and the degree of certainty in it, that is possible at this preliminary stage of the assessment process.
79. For the purposes of the PEIR, it is possible to identify a number of projects and plans which are likely to feature in that assessment and consider the extent to which cumulative effects might arise. Within each topic chapter, the following information is presented:
- Stage 1: Impact Screening - Screening for cumulative impacts; and
 - Stage 2: Project Screening - A preliminary short list of projects considered for CEA for that topic, including a brief description as to how projects have been screened in and the initial tier level they have been assigned. This follows the four staged approach as listed in paragraph 69.
80. The available information regarding many other projects is continually changing as they move through the development process, for example, the Outer Dowsing PEIR (by Q2 2023), the decision on Hornsea Project Four (Q3 2023), and the Sheringham Shoal and Dudgeon Extension Projects examination (Q3 2023). The information that is made public from these and other relevant projects will alter the details presented in the CEA for the Projects. As such, a final CEA will be included in the later stages of the EIA and completed and reported on in the ES, when the main assessments of the DBS East and/or DBS West proposals have been undertaken and the extent to which other plans, programmes or projects might lead to cumulative effects can be fully considered.

6.7.5 Transboundary Effects Assessment Methodology

81. The United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context (referred to as the Espoo Convention) requires that assessments are extended across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary effects.
82. Regulation 32 of the EIA Regulations sets procedures to address issues associated with a development that is likely to have a significant effect on the environment in a Member State of the European Economic Area (EEA).
83. The procedures involve providing information to the Member State and for the Planning Inspectorate to enter into consultation with that State regarding the significant impacts of the development and the associated mitigation measures. Further advice on transboundary issues, in particular with regard to consultation is provided in the Planning Inspectorate Advice Note Twelve (Planning Inspectorate, 2020b).
84. For the Projects, the potential for transboundary effects has been identified in relation to marine mammals, offshore ornithology, commercial fisheries, shipping and navigation, aviation and radar and offshore archaeology and marine heritage within the Scoping Report (RWE Renewables, 2022) and confirmed by the Planning Inspectorate on behalf of the Secretary of State (SoS) on the 1st February 2023 in the transboundary screening (The Planning Inspectorate, 2023a).
85. Following notification by the Planning Inspectorate on behalf of the Secretary of State under Regulation 32 of the EIA Regulations the following EEA States have confirmed they wish to participate (The Planning Inspectorate, 2023b):
 - Germany;
 - The Netherlands; and
 - Norway.
86. Sweden advised that it does not wish to participate, and no responses were received from Belgium, Denmark and France, and therefore the Secretary of State will not undertake Stage 2 consultation with these States at this time.

6.7.6 Major Accidents and Disasters

87. The EIA Regulations also require the Applicant to consider significant risks to the receiving communities and environment, for example through major accidents or disasters. Similarly, significant effects arising from the vulnerability of the Projects to major accidents or disasters should be considered. Relevant risks are covered in the topic chapters within this PEIR.
88. Offshore wind developments have an intrinsically low risk of causing major accidents. The turbines, blades towers and foundation bases of OWFs have an excellent safety record with a very low failure rate and are positioned many kilometres offshore away from populated areas and the public. On the rare occasion that offshore turbine blades have been lost into the sea or damage has been caused to a turbine by a fire within the nacelle, this has resulted without injury. The performance of each turbine is constantly monitored through the Supervisory Control and Data Acquisition (SCADA) system sending performance data through to a central, partly automated monitoring and control centre. As a result a problem can be quickly detected and pre-prepared safety management action plans rapidly enacted.
89. Whilst exposed power cables on the seabed can pose a snagging risk to shipping and fishing vessels, the offshore cables will be buried where possible to protect the cables and remove the snagging risk. This is discussed in detail in **Chapter 14 Shipping and Navigation**, which also discusses the risk that the increased vessel movement to and from the site may pose to navigational safety during construction and operational phases.
90. The Projects will utilise the principles outlined under the CDM Regulations as a framework for the management of design safety, with the outcome that the buried cables onshore and offshore pose very little risk to the public.
91. The risk of substation fires is historically low; however, substation fires can impact the supply of electricity and create a localised fire hazard. The highest appropriate levels of fire protection and resilience will be specified for the onshore substations to minimise fire risks. The onshore substations are also located away from populated areas (see **Chapter 4 Site Selection & Assessment of Alternatives**).
92. The small quantities of lubricants, fuel and cleaning equipment required within the Projects will be stored in suitable facilities designed to the relevant regulations and policy design guidance.

93. The offshore wind industry strives for the highest possible health and safety standards across the supply chain. However, there have been incidents including a small number of worker fatalities during the construction and operation of OWFs. Risks to the public onshore and sea users offshore during construction have been minimised through the use of controlled construction sites onshore and vessel safety zones offshore (**Chapter 5 Project Description**).
94. Safety zones are temporary exclusion areas enacted during construction, allowing the Applicant and its contractors to control vessel movements to enable safe construction works to proceed.
95. Onshore, controlled or closed construction sites will be operated where construction works are undertaken, in sections where access is strictly controlled during periods when the works are ongoing.
96. The Applicant recognises the importance of the highest performance levels of health and safety to be incorporated into the Project. There is a commitment to adhere to a high level of process safety, from design to operations and for all staff, contractors and suppliers to have a high level of safety awareness and knowledge of safety and safe behaviour. The Applicant will enact a Code of Conduct for suppliers, contractors and subcontractors. They must all comply with the Code as well as health and safety legislation. The Applicant will ensure that employees have undergone necessary health and safety training.
97. With a commitment to the highest health and safety standards in design and working practices enacted, none of the anticipated construction works or operational procedures (as detailed in **Chapter 5 Project Description**) is expected to pose an appreciable risk of major accidents or disasters.
98. In conclusion, the risk of 'major accidents and/or disasters' occurring associated with any aspect of the Projects, during the construction, operation and decommissioning phases is negligible.

6.7.7 Assumptions and Limitations

99. Topic-specific assumptions and limitations to the assessment are highlighted within the respective topic chapters. The Applicant will continue to attempt to address such limitations following the publication of this PEIR as far as appropriate and proportionate to ensure the ES submitted with the DCO application is robust and as accurate as possible. Further consultation with statutory and non-statutory stakeholders will be undertaken on the approach to address such limitations.

6.8 Summary

100. This chapter of the PEIR sets out a framework methodology for the assessments presented within each of the individual technical topic chapters. Where a technical topic assessment departs from the framework set out within this chapter, it is highlighted and explained within the respective topic chapter.
101. The approach to the EIA outlined within this chapter accords with all relevant legislation and policy, in particular, the Planning Act 2008 and associated EIA Regulations.

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Dogger Bank South Offshore Wind Farms

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