DOGGER BANK D WIND FARM

Preliminary Environmental Information Report

Volume 2
Appendix 8.1 Consultation Responses for Marine Physical Processes

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Prepared By:	**Royal HaskoningDHV**
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Glossary

Term	Definition
Design	All of the decisions that shape a development throughout its design and pre-construction, construction / commissioning, operation and, where relevant, decommissioning phases.
Effect	An effect is the consequence of an impact when considered in combination with the receptor's sensitivity / value / importance, defined in terms of significance.
Environmental Impact Assessment (EIA)	A process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information and includes the publication of an Environmental Statement.
Environmental Statement (ES)	A document reporting the findings of the EIA which describes the measures proposed to mitigate any likely significant effects.
Expert Topic Group (ETG)	A forum for targeted technical engagement with relevant stakeholders through the EPP.
Impact	A change resulting from an activity associated with the Project, defined in terms of magnitude.
Mitigation	Any action or process designed to avoid, prevent, reduce or, if possible, offset potentially significant adverse effects of a development. All mitigation measures adopted by the Project are provided in the Commitments Register.
Scoping Opinion	A written opinion issued by the Planning Inspectorate on behalf of the Secretary of State regarding the scope and level of detail of the information to be provided in the Applicant's Environmental Statement. The Scoping Opinion for the Project was adopted by the Secretary of State on 02 August 2024.
Scoping Report	A request by the Applicant made to the Planning Inspectorate for a Scoping Opinion on behalf of the Secretary of State. The Scoping Report for the Project was submitted to the Secretary of State on 24 June 2024.
Study Areas	A geographical area and / or temporal limit defined for each EIA topic to identify sensitive receptors and assess the relevant likely significant effects.
The Applicant	SSE Renewables and Equinor acting through 'Doggerbank Offshore Wind Farm Project 4 Projco Limited'
The Project	Dogger Bank D Offshore Wind Farm Project, also referred to as DBD in this PEIR.

8.1 Consultation Responses for Marine Physical Processes

1. **Volume 1, Chapter 8 Marine Physical Processes** for the Dogger Bank D Offshore Wind Farm (hereafter 'the Project' or 'DBD') has been informed by consultation with the Planning Inspectorate and stakeholders following the publication of the Scoping Report (Royal HaskoningDHV, 2024) and the comments contained within the Scoping Opinion (Planning Inspectorate, 2024). This appendix contains details of the relevant comments for **Volume 1, Chapter 8 Marine Physical Processes** and the Applicant's responses in **Table 8.1-1**.

2. The Applicant previously submitted a Scoping Report in 2023 based on project parameters at that time. The 2024 Scoping Report (Royal HaskoningDHV, 2024) and adopted Scoping Opinion (Planning Inspectorate, 2024) have superseded the 2023 Scoping Report and as such consultation responses on the 2023 Scoping Report are not considered further in this document except where they are included in the 2024 consultee responses and remain relevant to the Project.

Table 8.1-1 Consultation Responses for Marine Physical Processes

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	Scoping Opinion (02/08/24)	We note: • Impacts from deposition of sediment and smothering are not covered for all construction activities. This is important for any material deposited from seabed preparation works, foundation and cable installation and sandwave clearance.	Impacts from changes in suspended sediment concentration are addressed within **Section 8.7.2.1**, **Section 8.7.2.2,** and **Section 8.7.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**. Impacts from changes in hydrodynamics are included within **Section 8.7.3.1, Section 8.7.3.2,** and **Section 8.7.3.3 in Volume 1, Chapter 8 Marine Physical Processes**. Impacts on benthic habitats are addressed in the **Volume 1, Chapter 10 Benthic and Intertidal Ecology**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
		• It is not clear in the benthic section how any changes to hydrodynamics and impacts of these on benthic habitats will be taken into account e.g. changes in water flow, wave and tide climate. • Impacts from boulder clearance, both removal and deposition must be taken into account • Impacts from UXO clearance must be taken into account.	The impacts of UXO have not been assessed, as a separate marine licence application will be considered for any UXO clearance works which would be subject to its own environmental assessment. Impacts from boulder clearance are addressed in **Volume 1, Chapter 10 Benthic and Intertidal Ecology**. The impacts from boulder clearance have not been assessed in **Volume 1, Chapter 8 Marine Physical Processes** at PEIR but will be incorporated into the assessment at ES.
Natural England	Scoping Opinion (02/08/24)	We advise that the array and offshore ECC should be scoped in when assessing the impact of increased suspended sediment concentrations during construction, including site preparation works.	Impacts from changes in suspended sediment concentration during construction are addressed within **Section 8.7.2.1, Section 8.7.2.2,** and **Section 8.7.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**. Impacts on benthic habitats are addressed in **Volume 1, Chapter 10 Benthic and Intertidal Ecology**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Planning Inspectorate	Scoping Opinion (02/08/24)	The Scoping Report proposes to scope out impacts on wave and tidal currents from the presence of physical structures in the water column on the basis that during construction, the potential effect from the presence of physical structures in the water column on wave and tidal currents will increase incrementally with the greatest effects being predicted during operation. The Inspectorate notes that the ES would include an assessment of the greatest effects during operation and agrees that this matter can be scoped out of further assessment for the offshore area. The Scoping Report provides limited information regarding the construction works in the nearshore area. The Inspectorate considers the potential presence of temporary cofferdams within the nearshore, or seabed excavation in nearshore areas could result in changes in wave and / or current flows. On this basis the Inspectorate does not agree to scope out this matter for the nearshore area. The ES should provide an assessment where significant effects are likely to occur, or information demonstrating agreement with the relevant consultation bodies and the absence of a LSE.	The Applicant has removed the requirement for a cofferdam in the intertidal area during construction as outlined in **Volume 1, Chapter 4 Project Description**. The commitment to trenchless techniques at the landfall means there will be no structures or excavation within the intertidal area.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Planning Inspectorate	Scoping Opinion (02/08/24)	Section 7.2 of the Scoping Report does not refer to designated sites. The Applicant's attention is drawn to comments from NE (Appendix 2 of this Opinion) regarding designated sites / features located within the marine physical processes Study Area. The Applicant should make effort to agree relevant receptors for inclusion in the Marine Physical Processes ES assessment with relevant consultation bodies, including NE.	The designated sites the Project is aware of, including Dogger Bank Special Area of Conservation (DB SAC) and Holderness Inshore / Offshore Marine Conservation Zones (MCZ), have been agreed with Natural England. This has been confirmed through the Habitat Regulations Assessment (HRA) Screening Report, HRA Screening Addendum and the MCZ Screening Report.
Planning Inspectorate	Scoping Opinion (02/08/24)	Given that repair and maintenance vessels will only be active during the operational phase, the Inspectorate agrees to scope this matter out of further assessment for construction and decommissioning.	Noted.
Planning Inspectorate	Scoping Opinion (02/08/24)	See comment in Table 2.2 above - the Inspectorate is not in a position to agree to scope this matter out until it has undertaken its separate transboundary re-screening exercise. (Ref 2.2.6).	An assessment of transboundary effects is outlined in **Section 8.9** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Planning Inspectorate	Scoping Opinion (02/08/24)	The Scoping Report proposes to scope out the impacts on water circulation to the Flamborough Front during construction and decommissioning. Rationale has not been provided for an operational phase only assessment. The Inspectorate considers that the greatest effects are likely to occur at the fully operative Array Area. However, given the lack of rationale provided for an operation only assessment and noting the potential presence of temporary cofferdams within the nearshore area, the Inspectorate does not agree to scope this matter out of further assessment. The ES should provide an assessment where significant effects are likely to occur, or information demonstrating agreement with the relevant consultation bodies and the absence of a LSE.	The Flamborough Front is a thermal oceanic front that results in stratification in the water column. As with waves and tides, the greatest potential for effect will be during operation when all structures are present in the water column. Further justification for this approach has been provided in **Section 8.7.3.3** in **Volume 1, Chapter 8 Marine Physical Processes**. The effect of cofferdams on the Flamborough Front is scoped out as the water column in the nearshore is not stratified due to mixing by wave and tidal currents. Additionally, the Applicant has removed the requirement for a cofferdam in the intertidal area during construction as outlined in **Volume 1, Chapter 4 Project Description**. The Flamborough Front is not present in or influenced by structures in, the nearshore and therefore remains scoped out in relation to nearshore activities and structures (i.e. cofferdams).
Planning Inspectorate	Scoping Opinion (02/08/24)	The Scoping Report states that the assessment of effects on marine physical processes will consider near-field and far-field areas, with the Zones of Influence (ZoI) to be determined as part of the Preliminary Environmental Information Report / ES, through further understanding of tidal ellipses and wave data relative to the direct footprint of the Proposed Development. The ES should clearly define the Study Area, based on the ZoI, together with a robust justification for its final extent.	The approach to defining ZoIs has been presented to the ETG1 meeting 2 (22/07/24). The parameters to determine the ZoIs have been clearly defined in **Section 8.4.3** and **Section 8.8.2** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Planning Inspectorate	Scoping Opinion (02/08/24)	Paragraph 280 of the Scoping Report states that the Holderness coast is one of the most rapidly eroding coasts in Europe. The Inspectorate considers that the ES should provide a full assessment of the potential for future, rapid, erosion of the cliffs. The potential for any infrastructure to be exposed to coastal processes during the operational phase, or decommissioning, should be considered in order to reduce the need to carry out mitigation and the Applicant is advised to consider the implications of coastal change on the chosen landfall siting and construction methodology. Reference should be made to the relevant Shoreline Management Plan (SMP).	A Coastal Erosion Assessment has been undertaken and is provided in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**. An assessment of landfall infrastructure in relation to coastal erosion during operation and decommissioning has been undertaken in **Section 8.7.2.3** and **Section 8.7.2.4** in **Volume 1, Chapter 8 Marine Physical Processes**. The SMP is considered in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**.
Planning Inspectorate	Scoping Opinion (02/08/24)	The Applicant states that the results of numerical modelling undertaken for the other Dogger Bank Zone offshore wind farms will be used alongside the results of the new models as part of the conceptual evidence-based assessment of potential effects of the Proposed Development. The ES should provide a justification as to why use of existing modelling provides a robust approach and is relevant to the physical and sedimentary environment at Dogger Bank D. Effort should be made to agree the approach with relevant consultation bodies.	The results of bespoke numerical modelling underpin the assessment, instead of results from existing models. This approach has been discussed and agreed ETG 1 meeting 2 (22/07/24). The results of bespoke numerical modelling are provided in **Appendix 8.3 Marine Physical Process Modelling Report**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Planning Inspectorate	Scoping Opinion (02/08/24)	Natural England (NE) highlights in its scoping consultation response (Appendix 2 of this Opinion) that the baseline characterisation presented does not cover underlying geology, seabed mobility, sediment transport pathways and rates, bedforms, thickness of sediment units, surge water levels and currents and seismic activity. The Applicant should make effort to agree the description of the baseline environment presented within the ES with relevant consultation bodies, including NE.	These topics have been included in **Volume 1, Chapter 8 Marine Physical Processes** and were presented for discussion within ETGs. The following topics are included in the following relevant sections in **Volume 1, Chapter 8 Marine Physical Processes**: • Underlying geology – **Section 8.6.1.2**, • Seabed mobility – **Section 8.6.1.8**, • Sediment transport pathways and rates – **Section 8.6.1.8** and **Section 8.6.1.10**, • Bedforms – **Section 8.6.1.1**, • Thickness of sediment units – **Section 8.6.1.2** and **Section 8.6.1.7**, • Surge water levels and currents - **Section 8.6.1.3, Section 8.6.1.4,** and **Section 8.6.1.5**, and • Seismic activity - will be included in the ES at DCO submission.
Environment Agency	Scoping Opinion (02/08/24)	In general, we agree with the topics being scoped in for further assessment within this section and with the assessment approach taken.	Noted.

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Environment Agency	Scoping Opinion (02/08/24)	The scoping boundary crosses a part of the coast designated as a Coastal Change Management Area by East Riding of Yorkshire Council in their adopted Local Plan (2016). Part F of Policy ENV6 of the Local Plan is clear that proposals in this area will be supported if it is ensured that development is safe from the risks of coastal change for its lifetime. The Applicant should start with an assumed lifetime of at least 75 years in their assessment of the effects of climate change in relation to coastal erosion and flood risk, as suggested by the Planning Practice Guidance https://www.gov.uk/guidance/flood-risk-and-coastal-change#planning-and-flood-risk.	The Coastal Erosion Assessment (see Section 8.6.1.13 in **Volume 8 Marine Physical Processes**) considers a project lifespan of 45 years (up to 2070). Considering a lifespan of 75 year is disproportionate to the Project's design. The Planning Practice Guidance states that the lifetime of a development does not necessarily need to be 100 years if specific justification for considering a different period can be provided. Here, we consider the full lifespan of the Project from construction through to decommissioning.
Environment Agency	Scoping Opinion (02/08/24)	The Applicant should make reference to the relevant Shoreline Management Plan (SMP) in their assessment. The latest SMP information can be viewed online via the Shoreline Management Plan Explorer (https://environment.data.gov.uk/shoreline-planning). In brief, this identifies areas where there is a policy to "Hold the Line", such as around existing settlements, and areas where natural erosion will continue. The Holderness coastline is retreating in many parts of the Study Area. The National Coastal Erosion Risk Mapping may also be of relevance to the assessment. https://www.data.gov.uk/dataset/7564fcf7-2dd2-4878-bfb9-11c5cf971cf9/national-coastal-erosion-risk-mapping-ncerm-national-2018-2021.	This information has been presented In **Section 8.2.1** and **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**.

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Natural England	Scoping Opinion (02/08/24)	We consider that the characterisation of the existing environment is missing some key features. Please see Annex C Section 7.2 for detailed comments below.	The Baseline Environment section of the PEIR (**Section 8.6** in **Volume 1, Chapter 8 Marine Physical Processes**) includes the following key features: bathymetry and seabed features, marine geology, water levels, historic sea-level rise, tidal currents, waves, seabed sediments, sediment transport and seabed mobility, stratification, suspended sediment concentrations, coastal geology and geomorphology, coastal and nearshore sediment transport and coastal erosion.
Natural England	Scoping Opinion (02/08/24)	We consider that all relevant marine physical processes have been identified / acknowledged but recommend that some of these should be further thinned out and assessed separately rather than grouped together. Please see Annex C Section 7.2 for detailed comments below.	The assessment of effects has been separated into key topic sections by relevant activity **within Section 8.7** in **Volume 1, Chapter 8 Marine Physical Processes**. For example, changes to suspended sediment concentration due to construction activities has been separated into drilling for foundation installation, seabed preparation for foundation installation and cable installation. A similar subdivision has been adopted for all other effects.
Natural England	Scoping Opinion (02/08/24)	We do not agree with all of the marine physical processes that have been scoped out from further consideration, including impacts on wave and tidal currents at the nearshore, and impacts of suspended sediment concentrations during construction in the intertidal zone. Please see Annex C Section 7.2 for detailed comments below.	The Applicant has removed the requirement for a cofferdam in the intertidal area during construction as outlined in **Volume 1, Chapter 4 Project Description**. The commitment to trenchless techniques at the landfall means there will be no structures or excavation within the intertidal area.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	Scoping Opinion (02/08/24)	We consider that other sources of data could be addressed, and caution against the age of some of the existing datasets that have been referenced. Please see Annex C Section 7.2 for detailed comments below.	The Baseline Environment section of the PEIR (**Section 8.6** in **Volume 1, Chapter 8 Marine Physical Processes**) includes outputs from project specific numerical modelling of wave and tide regime. The Cefas suspended sediment data is the best available for the North Sea despite it being modelled between 1998-2015. The Baseline Environment section will be updated at ES with results of recent project findings (monitoring) where available.
Natural England	Scoping Opinion (02/08/24)	The proposed assessment approach is lacking rationale and justification for using previous numerical modelling work as well as specific marine physical processes receptors. Please see Annex C Section 7.2 for detailed comments below.	The results of bespoke numerical modelling underpin the assessment, instead of results from existing models. This approach has been discussed and agreed within previous ETGs. The results of bespoke numerical modelling are provided in **Appendix 8.3 Marine Physical Process Modelling Report**.
Natural England	Scoping Opinion (02/08/24)	"The baseline characterisation does not cover underlying geology, seabed mobility, sediment transport pathways and rates, bedforms, thickness of sediment units, surge water levels and currents. In 1994 an earthquake with a Richter magnitude of 4.4 occurred just south of the Danish part of the Dogger Bank. Whilst in 1931, the Dogger Bank experienced an earthquake with a magnitude of 6.1 on the Richter scale, in the UK part of the bank, which resulted in formation of a small tsunami (source: British Geological Survey). Therefore, seismic activity should be taken into consideration by the Project.	The following topics are included in the relevant sections in **Volume 1, Chapter 8 Marine Physical Processes:** • Underlying geology – **Section 8.6.1.2**, • Seabed mobility – **Section 8.6.1.8**, • Sediment transport pathways and rates – **Section 8.6.1.8** and **Section 8.6.1.10**, • Bedforms – **Section 8.6.1.1**, • Thickness of sediment units – **Section 8.6.1.2** and **Section 8.6.1.7**,

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
		We would advise considering the following for the Study Area: • underlying geology • seabed mobility • sediment transport rates and pathways • thickness of sediment units • surge water levels and currents • seismic activity"	• Surge water levels and currents – **Section 8.6.1.3**, **Section 8.6.1.4**, and **Section 8.6.1.5**, and • Seismic activity – will be included in the ES at DCO submission.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	Scoping Opinion (02/08/24)	2023 comment: 'Impacts on Waves and Tidal Currents' during construction have been scoped out of the EIA. However, impacts within the nearshore zone should remain scoped in. For example, the presence of temporary cofferdams within the nearshore or seabed excavation in shallow / nearshore areas could give rise to changes in waves and / or current flows. We advise that these impacts in the nearshore or shallow water areas should remain scoped in. 2024 updated comments: We note that the Applicant has acknowledged this recommendation and has justified not scoping in wave and tidal current impacts on the nearshore on the basis that there is "limited scale of the construction activities towards the coast [...] changes in physical processes are effectively zero." Given that the Project "may involve one or more coffer dams" (para 286), Natural England maintain that this impact pathway should be scoped in at the nearshore, at least until further details of landfall methods are confirmed."	The Applicant has removed the requirement for a cofferdam in the intertidal area during construction as outlined in **Volume 1, Chapter 4 Project Description**. The commitment to trenchless techniques at the landfall means there will be no structures or excavation within the intertidal area.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	Scoping Opinion (02/08/24)	Impacts from scour protection at landfall on sediment transport have not been discussed, but please note that Natural England do not support the use of scour protection within the 10m depth contour. This is based on evidence provided for the Dogger Bank A&B Offshore Wind Farms, and has subsequently been committed to for Hornsea Project Four, Eastern Green Link 2 and Northern Endurance.	The Applicant will prepare a Cable Burial Risk Assessment (CO27 in **Appendix 6.3, Commitments Register**) and this will be used to confirm the absence of need for cable protection in the nearshore (above 10m contour).
Natural England	Scoping Opinion (02/08/24)	2023 comment: This section considers changes to bedload sediment transport and seabed morphology due to seabed preparation for foundation (and scour protection) and cable installation, sediment deposition, sandwave clearance and also UXO. There are too many impacts considered within one umbrella term here. These impacts need to be thinned out and assessed separately. Moreover, bedload sediment transport could also be affected by the presence of cable protection measures and / or cable crossings in shallow depths during operation.	The assessment of effects, **Section 8.7** in **Volume 1, Chapter 8 Marine Physical Processes**, has been separated into changes to bedload sediment transport and changes to suspended sediment and associated changes to seabed morphology. The effect of different constructions has also been separated into drilling for foundation installation, seabed preparation for foundation installation and cable installation

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
		2024 updated comments: We note that impacts from bedload sediment transport and seabed morphological change are now separated between landfall and offshore, but impacts from foundation preparation and cable preparation are still considered as a whole. We recommend further separating the impacts by 'transmission' and 'generation' impacts. We will provide further comment with regard to UXO impacts once conclusions from independent UXO investigations are available."	
Natural England	Scoping Opinion (02/08/24)	This section includes multiple construction activities and will need to be thinned out for consideration in the ES. The intertidal zone has not been included here either. We would advise that these impacts should be broken down into separate impacts for assessment in the ES. In addition, consider increased suspended sediment loads in the intertidal zone during construction.	The assessment of effects, **Section 8.7** in **Volume 1, Chapter 8 Marine Physical Processes**, has been separated into changes to bedload sediment transport and changes to suspended sediment and associated changes to seabed morphology. The effect of different constructions has also been separated into drilling for foundation installation, seabed preparation for foundation installation and cable installation.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	Scoping Opinion (02/08/24)	2023 comment: There are multiple impacts to consider under this term which should be considered individually in the ES. Cumulative impacts will also need to be considered and assessed. These impacts need to be thinned out and assessed separately. We also advise considering and assessing cumulative impacts due to the presence of a cluster of OWFs across the Dogger Bank Zone. Furthermore, we advise considering the spatial extent of projected changes to the wave regime downwind of the array and how changes in significant wave height could affect morphological processes across Dogger Bank SAC over the lifetime of the Project. We also advise considering how Dogger Bank D as part of a cluster of OWFs might lead to large-scale hydrodynamic changes. 2024 updated comments: Topic corrected to read “(during operation)” rather than “(during construction)”."	The assessment of effects, **Section 8.7** in **Volume 1, Chapter 8 Marine Physical Processes**, has been separated into changes to bedload sediment transport and changes to suspended sediment and associated changes to seabed morphology. The effect of different constructions has also been separated into drilling for foundation installation, seabed preparation for foundation installation and cable installation. The cumulative effect of multiple wind farms across the Dogger Bank has been modelled, the results of this are provided in **Appendix 8.3 Marine Physical Process Modelling Report**. These modelling results have been used to inform the assessment within **Section 8.7** and **Section 8.8** in **Volume 1, Chapter 8 Marine Physical Processes**. The outputs of the assessment within **Section 8.7** and **Section 8.8** in **Volume 1, Chapter 8 Marine Physical Processes**, specifically consider the various impacts on the Dogger Bank SAC and conclusions on the effects are presented in the **Report to Inform the Appropriate Assessment (RIAA) (document reference 5.3)** that supports the PEIR.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	Scoping Opinion (02/08/24)	It is stated that "effects on tidal currents do cross into Dutch waters, while the effects on waves cross into all adjacent international waters". This needs to be fully considered and assessed. The scale of this effect needs to be shown and also how far it would extend beyond the Study Area. The potential for large-scale hydrodynamic changes due to the cluster of OWFs across Dogger Bank and transboundary effects needs to be considered and fully assessed. We advise that the potential transboundary effect of the Dogger Bank OWF cluster needs to be adequately assessed and quantified. Furthermore, transboundary effects should remain scoped in to the EIA until justification is provided for scoping them out.	This has been assessed using the outputs from wave and hydrodynamic modelling for the Project alone, and cumulatively due to the presence of multiple wind farms across the Dogger Bank both within the PEIR and the **RIAA (document reference 5.3)** (on transboundary sites). These assessments can be found within **Section 8.7** and **Section 8.9** in **Volume 1, Chapter 8 Marine Physical Processes**.
Natural England	Scoping Opinion (02/08/24)	This would need to be quantified, including plume extent / footprint, sediment concentration and subsequent sediment deposition thickness. Consequently, we would advise that this impact should be scoped into the EIA for transboundary effects.	This has been quantified within **Section 8.7** in **Volume 1, Chapter 8 Marine Physical Processes** and assessed in **Section 10.7** in **Volume 1, Chapter 10 Benthic and Intertidal Ecology**.
Natural England	Scoping Opinion (02/08/24)	We advise that a more realistic worst-case scenario should be considered and assessed.	The worst-case scenarios are outlined in **Section 8.4.4**. in **Volume 1, Chapter 8 Marine Physical Processes**. A summary of the worst-case scenarios in relation to the modelling undertaken is presented in **Section 8.5.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	Scoping Opinion (02/08/24)	We are broadly content with the approach to data collection, however, we advise consideration of Shoreline Management Plans (SMPs), Marine Plans, capital programmes for maintaining flood and coastal defences, and beach profile change through the lifetime of the Project. We would also refer the Applicant to our comment to section 7.2.2 regarding further baseline data requirements for consideration.	These plans and programmes have been considered in **Section 8.2.1** and **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**.
Natural England	Scoping Opinion (02/08/24)	NE best practice advises that, as a general benchmark, care should be taken when considering datasets older than five years (see Natural England's 'Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards' (as referenced in Summary of Main Points section of this consultation). Furthermore, we advise that sufficient accurate field data are needed to adequately describe both present day conditions within the Study Area, as well as longer-term historical change, in order to develop the conceptual understanding.	The Project will use wave data collected from two wave buoys located on Dogger Bank during the period July 2022-November 2023 as outlined in **Section 8.6.1.6** in **Volume 1, Chapter 8 Marine Physical Processes**. The older 2013 wave data will no longer be used to characterise the baseline wave regime and the new data has been used to calibrate the wave model as shown in **Section 8.3.4** of **Appendix 8.3 Marine Physical Process Modelling Report**. The Project has researched other sources of Suspended Sediment Concentration (SSC) data for the region and the Cefas 2013 data is the best available at this time. The Cefas 2013 SSC data has also been widely used in Marine Physical Processes chapters for other projects, even those recently submitted or in examination (e.g. Hornsea 4 ES and Dogger Bank South (DBS) ES).

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Natural England	Scoping Opinion (02/08/24)	Rationale and justification should be provided for using the previous numerical modelling work undertaken for the Dogger Bank Zone (DBZ) / other Dogger Bank OWF projects. The Applicant would need to show how the numerical modelling work carried out for the DBZ / other Dogger Bank OWF projects is applicable and relevant to the physical and sedimentary environment at Dogger Bank D.	The results of bespoke numerical models (**Appendix 8.3 Marine Physical Process Modelling Report**) underpin the assessment at PEIR, not the results from existing models. These models will also be supported at ES by monitoring data from the adjacent wind farms to provide an evidence base to test the outputs.
Natural England	Scoping Opinion (02/08/24)	"Marine Physical Processes receptors for consideration in the ES should include: • Holderness Coast • Designated sites within the Zone of Influence • Water column features (e.g. Flamborough Front) • Sandbanks • Geological SSSIs at landfall • Spurn Head • Any other Annex I features identified "	The relevant oceanographic, geological and geomorphological receptors, are outlined in **Section 8.7.1** in **Volume 1, Chapter 8 Marine Physical Processes**.
Natural England	Scoping Opinion (02/08/24)	We advise that designated sites / features within the marine physical processes Study Area should be identified and considered in the ES.	Relevant receptors including designated sites / features within the marine physical processes Study Area, as outlined in **Section 8.7.1** in **Volume 1, Chapter 8 Marine Physical Processes**, have been identified in the PEIR and will be considered in the ES.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	Scoping Opinion (02/08/24)	We advise the Applicant to consider the vulnerability of the proposed development options to coastal change, taking account of climate change predictions, during the Project's operational life and decommissioning period.	A Coastal Erosion Assessment has been undertaken as outlined in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**. The landfall design and methodology considers the results of this Coastal Erosion Assessment.
Natural England	Scoping Opinion (02/08/24)	JNCC advises a restore objective for the Attributes: Extent and Distribution and Structure and Function, and a maintain objective for the Attribute: Supporting Processes (December 2022). The significant number of offshore wind farm wind turbines and associated cabling built, being built, and proposed within this site will continue to change the substratum and hinder recovery of the sandbanks sediment composition and distribution, which will have a long-term impact over the lifetime of these projects. The impacts of the DBD Project on the site's conservation objectives need to be taken into consideration here.	The outputs of the assessment on waves (**Section 8.7.3.2** in **Volume 1, Chapter 8 Marine Physical Processes**), tidal currents (**Section 8.7.3.1** in **Volume 1, Chapter 8 Marine Physical Processes**), and sediment erosion and deposition (**Section 8.7.2.4**, **Section 8.7.2.5**, **Section 8.7.3.4** and **Section 8.7.3.5** in **Volume 1, Chapter 8 Marine Physical Processes**), specifically consider the various impacts on the Dogger Bank SAC. Conclusions on the effects in relation to the site's conservation objectives are presented in the **RIAA (document reference 5.3)**.
Natural England	Scoping Opinion (02/08/24)	The Flamborough Front gives rise to nutrient-rich waters and is considered to play a key role in primary production, the marine ecosystem and biogeochemical cycles. The baseline characterisation will need to consider firstly, the position of the Flamborough Front relative to Dogger Bank D, and secondly, if needed, temperature, salinity, stratification, primary productivity.	The Flamborough Front as an oceanographic feature is assessed in **Section 8.7.3.3** in **Volume 1, Chapter 8 Marine Physical Processes**. Changes in productivity related to the front are assessed in **Volume 1, Chapter 10 Benthic and Intertidal Ecology**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
MMO	Scoping Opinion (02/08/24)	For transboundary impacts, the MMO notes that these have been scoped in during operation only. Though it is noted that the report states that; 'Cumulative sediment plumes predicted for operation of Dogger Bank A, Dogger Bank B, Dogger Bank C and Sofia Offshore Wind Farms only disperse up to about 15km into Dutch waters and do not cross into German, Danish or Norwegian waters'.	This has been quantified in **Section 8.7** in **Volume 1, Chapter 8 Marine Physical Processes** and assessed in **Section 10.7** in **Volume 1, Chapter 10 Benthic and Intertidal Ecology**.
MMO	Scoping Opinion (02/08/24)	Sediment plumes are not mentioned in relation to construction, where it is likely for sediment to be mobilised from installations. Please confirm if this is likely to be of a similar magnitude? If so, transboundary impacts should also be considered during the construction phase.	This is assessed in **Section 8.7.2.1**, **Section 8.7.2.2** and **Section 8.7.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**.
MMO	Scoping Opinion (02/08/24)	It is noted that the only change between 2023 Scoping Report and this new Scoping Report is the exclusion of the coastal and nearshore sediment transport due to the fact that there is no Hydrogen Production Facility (HPF). Whilst the outfall pipes are no longer being constructed, consideration should still be given to drilling, as the Holderness coast is one of the most rapidly eroding. Cliff erosion also includes downcutting of the shore platform, which could create a risk of cable damage or exposure. Please confirm if this been considered? The MMO would expect to see sufficient justification in the text for this removal and the risk of any potential impacts discussed that could impact that coastal and nearshore region.	A Coastal Erosion Assessment has been undertaken as outlined in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**. The landfall design and methodology considers the results of this Coastal Erosion Assessment.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
MMO	Scoping Opinion (02/08/24)	Consideration is needed for the coastal interface between offshore and onshore aspects of the development, to ensure cables and project infrastructure aren't at risk of exposure or damage. Another consideration is how this project may impact the erosion rate (i.e. whether the Project will exacerbate it in any way through changes to tidal regime / sediment transport).	A Coastal Erosion Assessment has been undertaken as outlined in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**. The landfall design and methodology considers the results of this Coastal Erosion Assessment.
MMO	Scoping Opinion (02/08/24)	Due to the stage of the Project, mitigation is not discussed in detail, although cable and scour protection are mentioned. The Preliminary Environmental Information Report and Environmental Statement must go into significantly more detail into mitigation measures when any significant impacts on the marine physical processes have been identified.	Details of cable protection are provided in **Volume 1, Chapter 4 Project Description**. The effects of cable protection are assessed in **Section 8.7** in **Volume 1, Chapter 8 Marine Physical Processes**. The effects on bedload sediment transport due to the presence of cable protection measures offshore of the closure depth are of negligible significance. No additional mitigation is proposed, and cable burial is preferred to cable protection where viable.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 1 (13/09/23)	Zone of Influence We note in the ETG slides that it is proposed that the offshore Study Area will be determined using tidal ellipse data. We agree that this will be useful for estimating potential extent of changes to flows and sediment plume impacts, however, it would also be useful to consider the spatial extent of changes to wave conditions due to the array, and potential changes to sediment transport along adjacent beaches or coastlines during construction / operation.	**ETG Response** The Zone of Influence (ZoI) has been clearly defined in **Section 8.4.3** and **Section 8.8.2** in **Volume 1, Chapter 8 Marine Physical Processes**, using the tidal ellipse data and the outputs from the wave, hydrodynamic and plume dispersion models, and any other evidence related to sediment transport within and near to the export cable corridor and the array. **PEIR Updated Response** The ZoI is typically determined using tidal ellipse data but a different approach has been used for DBD in response to Natural England feedback at the first ETG meeting (13/09/23) and second ETG meeting (23/09/24). Therefore, a ZOI is defined for each effect. “Zone of Influence tide” for changes to tidal currents (and changes to suspended sediment concentration) defined using tidal ellipse data corroborated with outputs from the hydrodynamic modelling; “Zone of Influence wave” for changes to wave regime will be defined by the outputs from wave modelling; and “Zone of Influence coast” for changes to sediment transport at the coast. These are defined in **Section 8.4.3** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 1 (13/09/23)	Existing Data The wave and tide data collected for the earlier DB projects are now almost ten years old. Consequently, we would advise the Project to provide supporting evidence to demonstrate that prevailing conditions are comparable to the 2013 data. We also note that the Cefas suspended sediment concentration (SSC) data are also more than five years old and up-to-date data should be sought.	**ETG Response** The Project will use wave data collected from two wave buoys located on Dogger Bank during the period July 2022-November 2023. The older 2013 wave data will no longer be used to characterise the baseline wave regime and the new data will be used to calibrate the wave model. The Project has researched other sources of SSC data for the region and the Cefas 2013 data is the best available at this time. The Cefas 2013 SSC data has also been widely used in Marine Physical Processes chapters for other projects, even those recently submitted or in examination (e.g. Hornsea 4 ES and DBS ES). **PEIR Updated Response** The Project has used wave data collected from two wave buoys located on Dogger Bank during the period July 2022-November 2023 as outlined in **Section 8.6.1.6** in **Volume 1, Chapter 8 Marine Physical Processes**. The new data has been used to calibrate the wave model as shown in **Section 8.3.4** in **Appendix 8.3 Marine Physical Process Modelling Report**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 1 (13/09/23)	Approach to Modelling We note that bespoke wave, hydrodynamic and sediment dispersion numerical modelling will be undertaken to inform the impact assessment, which we welcome. However, it would be helpful if further details could be provided regarding the bespoke nature of this modelling. Furthermore, the modelling needs to be taken further to consider changes to sediment transport due to the proposed development.	**ETG Response** The term bespoke refers to project design parameters and calibration using project metocean data. The models will be run with industry standard MIKE software suite. Plume dispersion modelling will be undertaken to understand suspended sediment transport and deposition. The outputs of the wave and hydrodynamic modelling will include predictions of changes to bed shear stress which will be interpreted alongside seabed sediment particle size data to understand bedload sediment transport pathways. **PEIR Updated Response** The full modelling methodology and results are outlined in **Appendix 8.3 Marine Physical Process Modelling Report**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 1 (13/09/23)	Approach to Modelling We are concerned about potential impacts to the coastline and associated protected sites and designated features. However, there is no specific reference in the ETG slides or Technical Note to any modelling that will be undertaken to assess construction and operational related effects in the nearshore. Furthermore, it would be useful to understand if / how the modelling will be used to inform the assessment of impacts along the export cable corridor up to landfall / potential HPF marine intake / outfall system, HDD exit pits, temporary cofferdams etc.	**ETG Response** The hydrodynamic, wave and plume dispersion modelling extents will include the nearshore. Cable installation in the nearshore will be included in the plume dispersion model to assess construction effects. If cable protection measures are potentially required in the nearshore these will be included in the hydrodynamic and wave model of operational effects. The design and location of the HPF is yet to be confirmed but it is anticipated that a separate modelling work package will be undertaken to assess the effects of this infrastructure on marine physical processes but also sediment and water quality. The details of this modelling will be shared through the EPP when available. **PEIR Updated Response** The full modelling methodology and results are outlined in **Appendix 8.3 Marine Physical Process Modelling Report**. At this early stage of the Project, it is not clear if cable protection measures will be required in the nearshore. Therefore, without the detailed design information, it was not possible to model any effects of this structure on wave regime in the nearshore. This will be readdressed at ES. The Applicant has removed the HPF from the design envelope, so it has not been included in the assessment.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 1 (13/09/23)	Approach to Modelling We also note that only sediment dispersion modelling of suspended sediment resulting from drilled pile installation is considered in the Technical Note. There are other installation activities during the construction phase to consider. Therefore, we advise that the maximum design scenario (MDS) for marine processes for all installation activities likely to lead to elevated SSCs and subsequent sediment deposition should first be determined as this will inform the sediment plume and deposition modelling requirements.	**ETG Response** Plume dispersion modelling of cable installation and seabed preparation (including sand wave clearance if required) activities will be undertaken. **PEIR Updated Response** The results of plume dispersion modelling and the assessment of cable installation and seabed preparation activities are outlined in **Section 8.7.2.2** and **Section 8.7.3.2** in **Volume 1, Chapter 8 Marine Physical Processes**.
Natural England	ETG1 Meeting 1 (13/09/23)	Approach to Modelling We also advise, as part of good practice, that details of the model calibration, validation, sensitive testing, selection of key coefficients etc are provided in the model reporting.	**ETG Response** A Technical Report outlining the methodology, calibration, validation and outputs will be shared. **PEIR Updated Response** The full modelling methodology and results are outlined in **Appendix 8.3 Marine Physical Process Modelling Report**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 1 (13/09/23)	Existing Environment In Section 5.1, it suggests that 'there will be no significant changes in the baseline physical environment since the modelling was undertaken in 2013'. We advise that evidence should be provided in the reporting to demonstrate that the baseline physical environment has remained stable since the earlier data were collected.	**ETG Response** The Project will use wave data collected from two wave buoys located on Dogger Bank during the period July 2022-November 2023. The older wave data will no longer be used to characterise the baseline wave regime and the new data will be used to calibrate the wave model. **PEIR Updated Response** The Project has used wave data collected from two wave buoys located on Dogger Bank during the period July 2022-November 2023 as outlined in **Section 8.6.1.6** in **Volume 1, Chapter 8 Marine Physical Processes**. The new data has been used to calibrate the wave model as shown in **Section 8.3.4** of **Appendix 8.3 Marine Physical Process Modelling Report**.
Natural England	ETG1 Meeting 1 (13/09/23)	Existing Environment We would advise that the assessment will need to address potential effects of climate change and sea level rise during the Project's operational life and any decommissioning period.	**ETG Response** Climate change and sea-level rise will be incorporated into the assessment of future coastal erosion using UKCP data. **PEIR Updated Response** See **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 1 (13/09/23)	Realistic Worst-Case Scenario At present, there are three possible offshore infrastructure scheme layouts: Hydrogen option, National Grid option, and Multipurpose Interconnector option. Therefore, we advise that in order to have confidence in the EIA assessment, the Project needs to ensure that the 'true' WCS is considered in terms of likely maximum impacts and the different combinations of circumstances and design layout. Furthermore, it would be helpful to clearly show how these different scheme options will be represented in the modelling. We also advise that anticipated construction timescales will need to be considered in the modelling.	**ETG Response** The WCS for marine physical processes will be the option that includes the maximum number of marine infrastructure / activity components. **PEIR Updated Response** The worst-case scenarios are outlined in **Section 8.4.4** in **Volume 1, Chapter 8 Marine Physical Processes**. A summary of the worst-case scenarios in relation to the modelling undertaken is presented in **Section 8.5.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**.
MMO	ETG1 Meeting 1 (13/09/23)	The cumulative impact assessment appears to be based on temporal overlap of activities (i.e. defining simultaneous, or in-combination impacts such as sediment plumes) rather than cumulative, which would imply accumulation of impacts over a period of time. The MMO recommend a cumulative assessment of marine physical processes should map the impact of developments (past and anticipated future), which should be assessed in a way that would look at terms of potential changes to sediment transport gradients or hydrodynamic gradients.	A cumulative assessment of changes in suspended sediment concentration, transport, and seabed level due to Inter-Array Cable and Offshore Export Cable installation including at the landfall, is presented in **Section 8.8.3.1** in **Volume 1, Chapter 8 Marine Physical Processes.** The changes were assessed as negligible as the changes are short-lived and localised and the seabed returns to its dynamic state once construction activities cease. Therefore, no cumulative effects from construction activities at other relevant projects are expected.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
MMO	ETG1 Meeting 1 (13/09/23)	The MMO note that section 5.7 of the Technical Note lists potential transboundary effects on marine physical processes. The MMO recommend that the text explicitly states that transboundary impacts on marine physical processes have been scoped in.	**ETG Response** Transboundary effects for marine physical processes will be scoped in and the text updated in any future documentation to address this item. The Planning Inspectorate will enter into consultation with the State(s) in question regarding the significant transboundary effects and their associated mitigation measures. The methodology of the transboundary effects assessment will refer to the guidelines outlined under the Planning Inspectorate's Advice Note Twelve (The Planning Inspectorate, 2020). **PEIR Updated Response** Transboundary effects are assessed in **Section 8.9** in **Volume 1, Chapter 8 Marine Physical Processes**). The results of the assessment were informed by numerical modelling (**Appendix 8.3 Marine Physical Processes Modelling Report**) which showed the ZoI for changes to waves and tides did not extend into the adjacent Doggersbank SAC which is under Dutch jurisdiction. Transboundary effects for other receptors are considered in the relevant chapters (e.g. **Volume 1, Chapter 10 Benthic and Intertidal Ecology**).

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
MMO	ETG1 Meeting 1 (13/09/23)	There is no list provided of the desk-based sources or studies that are to be fed into the Preliminary Environmental Information Report (PEIR) so MMO cannot comment fully on how appropriate individual sources are. MMO expect all sources to be clearly referenced in the PEIR. However, we would encourage that data is from a reliable source and within a reasonable timeframe to the work that is to be undertaken.	**ETG Response** The full list of desk-based studies used to inform the baseline are provided within the PEIR. **PEIR Updated Response** Data and information sources are provided in **Section 8.5.2** in **Volume 1, Chapter 8 Marine Physical Processes** and cited in the text where relevant.
Natural England	ETG1 Meeting 1 (13/09/23)	The MPP Scoping Area was defined using tidal ellipse data. Natural England stated that they will respond in writing to this approach. Natural England to respond to MPP Scoping Area in writing by 11/10/23.	**ETG Response** The ZoI is typically determined using tidal ellipse data but a different approach has been used for DBD in response to Natural England feedback at the first ETG meeting (13/09/23) and second ETG meeting (23/09/24). Therefore, a ZOI is defined for each effect. “Zone of Influence tide” for changes to tidal currents (and changes to suspended sediment concentration) defined using tidal ellipse data corroborated with outputs from the hydrodynamic modelling; “Zone of Influence wave” for changes to wave regime will be defined by the outputs from wave modelling; and “Zone of Influence coast” for changes to sediment transport at the coast. **PEIR Updated Response**

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
			The Zones of Influence are defined in **Section 8.4.3** in **Volume 1, Chapter 8 Marine Physical Processes**.
Natural England	ETG1 Meeting 1 (13/09/23)	Natural England asked for clarification on whether future environmental change had been considered e.g. sea level rise.	**ETG Response** This was being considered along with coastal erosion using IPCC projections. **PEIR Updated Response** The future baseline is considered in **Section 8.6.2** in **Volume 1, Chapter 8 Marine Physical Processes** and includes sea-level rise projections.
Environment Agency	ETG1 Meeting 1 (13/09/23)	Environment Agency noted that the site-specific ERoYC data is best to use as NCERM is currently out of date and NCERM2 is national-scale modelling. Will need to find an interesting way to put climate change elements of the information into the recession rate. It was agreed and attendees invited to provide comments on the best approach to this. Natural England will respond in writing and provide some research on incorporating climate change into erosion research.	**ETG Response** This was being considered along with coastal erosion using IPCC projections. A Coastal Erosion Assessment has been undertaken and will be provided as an Appendix in the PEIR. An assessment of landfall infrastructure in relation to coastal erosion during operation and decommissioning will be undertaken at PEIR. **PEIR Updated Response** The future baseline is considered in **Section 8.6.2** in **Volume 1, Chapter 8 Marine Physical Processes** and includes sea-level rise projections. in **Volume 1, Chapter 8 Marine Physical Processes**. The landfall design and methodology considers the results of this Coastal Erosion Assessment.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 2 (22/07/24)	Defining the Zone of Influence Natural England provisionally agrees with the approach to defining different Zones of Influence for different marine physical processes and effects. We welcomed the definitions and found them useful in defining how the marine physical Study Area has been divided. It is important to consider how the different zones interact with one another, for example, wave-current interactions. We would also advise that the anticipated maximum zone of influence is identified (including on relevant maps) as this will inform the Study Area.	**ETG Response** We will define the ZoIs for individual processes but also consider when processes could combine creating a maximum ZoI. These ZoIs will be defined on maps where appropriate. **PEIR Updated Response** The ZoI is typically determined using tidal ellipse data but a different approach has been used for DBD in response to Natural England feedback at the first ETG meeting (13/09/23) and second ETG meeting (23/09/24). Therefore, a ZOI is defined for each effect. “Zone of Influence tide” for changes to tidal currents (and changes to suspended sediment concentration) defined using tidal ellipse data corroborated with outputs from the hydrodynamic modelling; “Zone of Influence wave” for changes to wave regime will be defined by the outputs from wave modelling; and “Zone of Influence coast” for changes to sediment transport at the coast. These are defined in **Section 8.4.3** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 2 (22/07/24)	Numerical Modelling We wish to see realistic worst-case scenarios modelled and presented, including for array layout and its potential environmental restrictions, wave directions and cumulative and transboundary effects. A realistic worst-case scenario is useful in defining what the probable impacts of the development are and where adjustments might need to be made. There are some existing offshore wind farms which have used a configuration where there are tighter spaces between turbines on the outer rim of the array, with more even spacing inside - this should also be modelled. Natural England provisionally agrees with the wave modelling directions from the north and north-east, however consideration should be given to the location of receptors around the array and which wind direction could impact these. For example, waves from the north-west could result in the largest transboundary effects and easterlies could combine with the dominant east to west tidal ellipse, potentially resulting in a larger impact on wake turbulence from structures and changes to sediment transport.	**ETG Response** The worst-case scenario presented at the ETG and being used for the numerical modelling is considered realistic at this point in the Project design. We acknowledge other wind farms have a closer spacing of turbines around the perimeter. However, at this early stage, the Project cannot commit to a similar scenario until ongoing assessments on wind yield and other constraints (such as navigation) have been completed. **PEIR Updated Response** The worst-case scenario for marine physical processes is outlined in **Section 8.4.4** in **Volume 1, Chapter 8 Marine Physical Processes** and includes the options that include the maximum number of marine infrastructure / activity components. A summary of the worst-case scenarios in relation to the modelling undertaken is presented in **Section 8.5.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**. The numerical modelling of wave regime considers waves approaching from a northerly, north-easterly, easterly and southerly direction. This is outlined in **Section 8.5.2.3.2** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 2 (22/07/24)	Approach to Data Collection In addition to the data being presented, UKHO portal and ERYC beach profile data could be added, as well as data to better understand impacts on beach draw down and changes to sediment transport processes due to cable installation activities at the landfall side. As additional data becomes available during the preapplication stage it should be used where possible to inform the baseline.	**ETG Response** Noted. **PEIR Updated Response** The ERYC beach profile data is presented in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes** where it is used to understand coastal erosion.
Natural England	ETG1 Meeting 2 (22/07/24)	Approach to Baseline Environment Characterisation We advise further consideration is given to the sediment transport pathways around Dogger Bank and across the Study Area. A further consideration is the link between changes to stratification, primary productivity and the Flamborough Front. The potential changes in significant wave height should be considered in terms of impacts to biological zonation on Dogger Bank.	**ETG Response** Noted, Royal HaskoningDHV (RHDHV) are requesting beach profile data from East Riding of Yorkshire Council (ERYC) to assess shore platform lowering. **PEIR Updated Response** Sediment transport pathways around the Dogger Bank are determined using the results of the tidal modelling and bed shear stress outputs. These are discussed in **Section 8.6.1.8** in **Volume 1, Chapter 8 Marine Physical Processes**. The Flamborough Front as an oceanographic feature is assessed in **Section 8.7.3.3** in **Volume 1, Chapter 8 Marine Physical Processes**. Changes in productivity related to the front are assessed in **Volume 1, Chapter 10 Benthic and Intertidal Ecology**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 2 (22/07/24)	Approach to Coastal Erosion Assessment. Natural England provisionally agrees with the method to assess coastal erosion, we advise that it would be useful to investigate changes to the shore platform through the lifetime of the Project. NCERM2 has used UKCP18 predictions and the 95% confidence level and is expected to be released to the public in December 2024 therefore could be used as part of the assessment.	**ETG Response** Noted, Royal HaskoningDHV (RHDHV) are requesting beach profile data from East Riding of Yorkshire Council (ERYC) to assess shore platform lowering. **PEIR Updated Response** The ERYC beach profile data are presented in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes** where they are used to understand coastal erosion. At the time of writing, the NCERM2 outputs were not available to inform the assessment but will be included in the ES.
Natural England	ETG1 Meeting 2 (22/07/24)	We recommend following our best practice guidance wherever possible.	**ETG Response** Noted. **PEIR Updated Response** The data and information sources used to inform the assessment are outlined in **Section 8.5.2** in **Volume 1, Chapter 8 Marine Physical Processes**. In most cases, data and information sources are less than 5 years old. Older data is used only when more recent data is not available.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 2 (22/07/24)	Natural England queried whether 113 is the current number of monopiles as this differs from scoping.	**ETG Response** The Applicant confirmed this is the case and it has been subject to ongoing refinement since the Scoping Report in June. **PEIR Updated Response** Realistic worst-case scenarios are defined in **Table 8- 5** in **Volume 1, Chapter 8 Marine Physical Processes**. The maximum number of turbines will be 113.
Natural England	ETG1 Meeting 2 (22/07/24)	Natural England asked whether modelling will occur on the realistic layouts.	**ETG Response** The Applicant responded that the realistic is not representative of the final design but is realistic in terms of capability to consider constraints e.g. shipping and navigation and offsets from Dogger Bank C (DBC). It is the most realistic at this stage of the Project but the final may differ. **PEIR Updated Response** Realistic worst-case scenarios are defined in **Table 8-5** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 2 (22/07/24)	How much merit is there in running multiple scenarios on the realistic worst-case if no consideration has yet been given to factors including the cable burial risk assessment, seabed conditions and ecological impacts on the seabed. This would avoid any wasted efforts into PEIR and ES.	**ETG Response** The Applicant responded that at PEIR, baseline characterisation is done on the wave / tidal regime. Infrastructure is inputted for operational effects. The sensitivity tests are run to capture any variation between the layouts and potential overlapping effects between turbines located close to one another (minimum separation distance) should micro-siting be required (e.g. due to geotechnical conditions). The sensitivity test ensures this worst-case is truly captured. In terms of ecological and benthic considerations, at this stage the modelling is focused on MPP only, but these aspects will feed into MPP considerations as the Project progresses. **PEIR Updated Response** A number of layouts were modelled and are defined in **Section 8.5.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**. The effects of changes in marine physical processes on benthic receptors is assessed in **Volume 1, Chapter 10 Benthic and Intertidal Ecology**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 2 (22/07/24)	Natural England noted that as more data is available this will inform scenario 3. However, due to 1 and 2 being unrealistic, questioned how useful the outputs are from these models are. There exists the potential to overpredict the effects.	**ETG Response** Scenarios 1 and 2 will remain, pending the results of layout design and micro-siting potential but will proceed with scenario 3 as the realistic worst-case in the modelling. **PEIR Updated Response** A number of layouts were modelled and are defined in **Section 8.5.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**.
Cefas	ETG1 Meeting 2 (22/07/24)	Two directions will be modelled was noted – from the North, dominant for most datasets, and Northeast which is the closest distance to shore. Modelling the north-east will allow assessment of changes in wave regime in relation to coastal receptors. The reasoning is supported but noted it would be preferable to look at wave periods in addition due to influences on sediment transport and resuspension.	**ETG Response** Extreme events have a longer period and therefore a lesser effect. This will be a standard consideration in the wave modelling effects but DBD will check and reconsider if this is still sensible. The literature / data will be supplied to the Project to use as evidence about longer waves interacting with the seabed. Literature to be supplied on the consideration of longer waves. **PEIR Updated Response** Waves with a range of wave periods were considered in the assessment as defined in **Table 8.15** in **Volume 1, Chapter 8 Marine Physical Processes**. The Applicant was not provided the literature discussed in the ETG but will consider this if provide at ES.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 2 (22/07/24)	The Project is on the median line and questioned the consideration of prevailing south-west due to shorter seas and longer fetch.	**ETG Response** This will be considered and justified where possible. SW seas and fetch will be considered. **PEIR Updated Response** The numerical modelling of wave regime considers waves approaching from a northerly, north-easterly, easterly and southerly direction. This is outlined in **Section 8.5.2.3.2** in **Volume 1, Chapter 8 Marine Physical Processes**. This provides a range of significant wave heights and periods that would represent all wave scenarios.
Natural England	ETG1 Meeting 2 (22/07/24)	There is a need to ensure transboundary effects are legislatively compliant and consideration has been given where applicable in the approach. YF supported this consideration. HB (RHDHV) displayed a map of the transboundary border on screen. YF raised that looking at the Dogger Bank wave rose, which direction (SW or NW) would have a greater effect in terms of the shadow of transboundary effects.	**ETG Response** A table could be created of different receptors and which wave direction periods they are most sensitive to in the PEIR. Consider a table of direction versus transboundary effects. **PEIR Updated Response** The assessment of changes to wave regime underpinned by the numerical modelling is outlined in **Section 8.7.3.2** in **Volume 1, Chapter 8 Marine Physical Processes**. Since Dogger Bank was the only receptor within the ZoI for waves, a table outlining all receptors was not included in the PEIR as it would have contained only a single entry. The same is true for transboundary effects.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Cefas	ETG1 Meeting 2 (22/07/24)	It was questioned if drawdown had been considered in addition to cliff erosion.	**ETG Response** It was confirmed this is assessed as part of the baseline scenario. A conceptual approach is assessed to understand the cross-shore profile of the cliffs into the nearshore and how this may translate landward with sea level rise and time. **PEIR Updated Response** An assessment of beach platform lowering has been included in **Section 8.6.1.13** and **Figure 8-20** in **Volume 1, Chapter 8 Marine Physical Processes**.
MMO	ETG1 Meeting 2 (22/07/24)	Our scientific advisors have not raised any concerns regarding the approach to defining Zones of Influence. However, the MMO will also defer to NE for further comments regarding Zones of Influence.	**ETG Response** Noted. **PEIR Updated Response** The Zones of Influence are defined in **Section 8.4.3** in **Volume 1, Chapter 8 Marine Physical Processes**.
MMO	ETG1 Meeting 2 (22/07/24)	The data collected is relevant to fisheries and can be used to inform the preliminary environmental information report (PEIR). The MMO require the primary data to have been collected within the last five years, older data sources may be used to support primary data, where appropriate.	**ETG Response** Noted. **PEIR Updated Response** The data and information sources used to inform the assessment are outlined in **Section 8.5.2** in **Volume 1, Chapter 8 Marine Physical Processes**. In most cases, data and information sources are less than five years old. Older data is used only when more recent data is not available.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Environment Agency	Draft ETG1 Meeting 2 (23/09/24)	ERoYC asked that NCERM2 (National Coastal Erosion Map) results have been compared to the outputs. This is useful for comparison but the scale of NCERM is very high level. It is finely tuned and the results are similar to those DB had produced.	**ETG Response** It was noted he will review this comparison in consideration if the numbers are close. It will be undertaken to do a NCERM comparison to coastal erosion outputs obtained. **PEIR Updated Response** An assessment of coastal erosion has been undertaken and is outlined in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**. At the time of writing, the NCERM2 outputs are not available to inform the assessment but will be included in the ES.
Environment Agency	Draft ETG1 Meeting 2 (23/09/24)	It was queried how the 1852-2003 data was measured. Then confirmed measuring posts were used from 1952, with further historic data being based on older OS maps. 2003 will be the most accurate data from that point on. It was added that using the most recent data will be more accurate in reflecting the future.	**ETG Response** This decision is supported. The coastal erosion report was updated (circulated prior to ETG1 meeting 3 30/10/23, Figure 3.3) to use 2003 onwards rates. **PEIR Updated Response** The Coastal Erosion Assessment outlined in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes** defined the recent monitoring period as being from 2003 onwards.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Environment Agency	Draft ETG1 Meeting 2 (23/09/24)	EA noted on decommissioning, that the EA will be looking for infrastructure which remains in-situ after decommissioning and becomes exposed due to erosion. The likelihood of this being assessed would therefore help the EA.	**ETG Response** Noted. **PEIR Updated Response** The landfall design and methodology considers the results of the Coastal Erosion Assessment as outlined in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**. The Applicant is considering a monitoring plan for coastal erosion following decommissioning to ensure any infrastructure at the landfall does not become exposed. The details of this plan will be confirmed at DCO submission.
Natural England	ETG1 Meeting 3 (30/10/24)	ETG Question - Does the ETG agree with the approach to marine physical processes numerical modelling? Natural England welcomes the bespoke approach adopted by the Project for wave, hydrodynamic and sediment dispersion modelling. We are broadly content with the overview presented in the ETG (and accompanying slides and minutes) of the approach to, and preliminary results of, the marine physical processes numerical modelling. However, we will provide further comments once more detailed information is provided including the results. We advise that, if possible, sensitivity testing results should be provided within the final reporting along with model calibration, validation and estimates of the model accuracy. For example, we note that the example presented in the ETG slides of measured vs	**ETG Response** Noted. **PEIR Updated Response** The full modelling methodology and results are outlined in **Appendix 8.3 Marine Physical Process Modelling Report**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
		modelled wave data describe conditions in April 2023, and it would wish to see how the modelled data compare with observed wave data in winter / storm conditions.	
Natural England	ETG1 Meeting 3 (30/10/24)	ETG Question - Does the ETG agree with the approach to marine physical processes numerical modelling? Following the discussions in ETG1 meeting 2 in July, the Project agreed to consider modelling an array layout with wind turbines slightly more densely spaced around outer boundary and less densely spaced wind turbines in the interior of the array, due to this being considered a possible realistic design layout. It is Natural England's advice that modelling for this design should be carried out if it is still being considered as a possible design layout. The appropriate blockage effects should be considered on all design layouts.	**ETG Response** This will be reassessed at ES with updated project design information. **PEIR Updated Response** A number of layouts were modelled and are defined in **Section 8.5.2.3** in **Volume 1, Chapter 8 Marine Physical Processes**. These layouts are considered realistic by the Applicant.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 3 (30/10/24)	ETG Question - Does the ETG agree with the approach to coastal erosion to use the 2070 setback in the assessment? For Natural England to agree with the use of the 2070 setback, we would need to see a clear justification for the reduction in the projections used which considers how long the assets are in situ. The design life of the Project is being stated as 35 years, if decommissioning is not included within the timeframe a longer setback assessment would need to take place to include the lifetime of the Project.	**ETG Response** With respect to using the 2100 cliff position as the position for set-back estimates, this is disproportionate because the operational life of the Project is 35 years. Assuming construction takes place between 2029 and 2034, 35 years hence would be 2069. Then, we assume that decommissioning would take a further year taking the design life of the Project to 2070. Decommissioning would not take 31 years, which would be the case if the 2100 estimate is used. Also, the guidance states that the lifetime of a development does not necessarily need to be 100 years if specific justification for considering a different period can be provided. In this case, a design life up to 2070 is justifiable evidence for using the cliff position in that future year as the position for determining the preferred inland location of landfall infrastructure as already shown by the long-term monitoring of the coastline with this data point being an outlier not a common occurrence. <u>Updated PEIR Response</u> The Coastal Erosion Assessment will be updated at ES to include a decommissioning period of five years which will extend the project lifetime to 2074.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
			The landfall design and methodology considers the results of the Coastal Erosion Assessment and is detailed in the **Volume 1, Chapter 8 Marine Physical Processes**. The Applicant is considering a monitoring plan for coastal erosion following decommissioning to ensure any infrastructure at the landfall does not become exposed. The details of this plan will be confirmed at DCO submission.
Natural England	ETG1 Meeting 3 (30/10/24)	ETG Question - Does the ETG agree with the approach to coastal erosion to use the 2070 setback in the assessment? Within the ETG it was mentioned the predicted average relative sea level rise rates were based on the UKCP18 predictions. Our Best practice guidance Flood and coastal risk projects, schemes and strategies: climate change allowances - GOV.UK states to use the 70th percentile (higher central) as the design allowance and 95th percentile (upper end) allowance in planning for more severe climate impacts. Please could further clarification on which percentile was used be provided, if it was the 50th then our advice would be to plot the 95% rates as a worst-case.	**ETG Response** The assessment of coastal erosion uses relative sea-level rise predictions for 5th percentile of the low (RCP2.6) emissions scenario, 50th percentile of the medium (RCP4.5) emissions scenario and the 95th percentile of the high (RCP8.5) emissions scenario from the UKCP18. Therefore, we have used the worst-case sea-level predictions as advised. **PEIR Updated Response** The Coastal Erosion Assessment is presented in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine and Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 3 (30/10/24)	ETG Question - Does the ETG agree with the approach to coastal erosion to use the 2070 setback in the assessment? Natural England agrees with the 2003 – 2024 data being used to calculate the coastal erosion rate, as the GPS data presents the worst-case scenario. For completeness, we recommend the 1989-2024 data being presented alongside the 2003- 2024 with the justification as to why this longer dataset has not been used for ES. Both the older and new data helps to inform our understanding of coastal change and should both, therefore, be included.	**ETG Response** Coastal erosion data is presented for the time ranges from 1852-2003 and 2003 to 2024 to inform understanding of long-term coastal change. **PEIR Updated Response** The Coastal Erosion Assessment is presented in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine and Physical Processes**.
Natural England (& EA)	ETG1 Meeting 3 (30/10/24)	Natural England recognises the importance of the Annex 1 sandbank Smithic Bank as a habitat and the sediment transport processes it provides on the Holderness coast. Natural England is concerned about the potential interaction with the sandbank feature. We welcome the Projects approach of considering it as a feature of importance in the PEIR. The cumulative impacts to the morphology of Smithic Bank due to multiple project cable installations will also need to be considered.	**ETG Response** The cumulative effects of multiple cable installation on Smithic Bank have been included. **PEIR Updated Response** See **Section 8.8.3** in **Volume 1, Chapter 8 Marine and Physical Processes**.
Natural England	ETG1 Meeting 3 (30/10/24)	Within Natural England's response to ETG1 meeting 2 in July, we provided advice on assessing changes to the Flamborough Front's stratification, and in turn primary productivity, due to the presence of not only the DBD Array, but also multiple other OWF developments. How does the project propose to assess the potential changes over the lifetime of the Project?	**ETG Response** Changes in water circulation due to the cumulative presence of infrastructure has been assessed. **PEIR Updated Response** See **Section 8.8.3.5** in **Volume 1, Chapter 8 Marine and Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Natural England	ETG1 Meeting 3 (30/10/24)	Within Natural England's response to ETG1 meeting 2 in July, we provided advice on the sediment transport pathways around Dogger Bank. Please could the Project provide an update on the considerations they have given to this.	**ETG Response** Tidal current induced bed shear stress was modelled and the results used to determine the size of sediments that could potentially be mobilised and transported as bedload. **PEIR Updated Response** See **Section 8.6.1.8** in **Volume 1, Chapter 8 Marine and Physical Processes**.
MMO	ETG1 Meeting 3 (30/10/24)	Does the ETG agree with the approach to wave and tidal current modelling? The MMO note that the hydrodynamic modelling is stated to be 'Based on sensitivity testing Layout B with Offshore Substation Platform (OSP) Option 2 selected' (please see Slide 15; Bullet point 5). This differs from the wave modelling approach in which a layout of turbines evenly spaced within the area (Layout A). Is Layout B realistic as a layout and are both layouts for hydrodynamic modelling to be included in the Preliminary Environmental Information Report (PEIR)? The MMO would recommend that modelled scenarios should be consistent and should consider a realistic worst-case scenario.	**ETG Response** The sensitivity tests of multiple layouts for both hydrodynamic and wave modelling have been included in the Marine Physical Processes Modelling Report which is a technical appendix to the Marine Physical Processes Chapter in the PEIR. **PEIR Updated Response** The results of numerical modelling are provided in **Appendix 8.3 Marine Physical Process Modelling Report**.
MMO (& Cefas)	ETG1 Meeting 3 (30/10/24)	Does the ETG agree with the approach to wave and tidal current modelling?	**ETG Response**

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
		In addition the MMO, in consultation with Cefas are unclear which scenarios are presented in slides 13 and 14 (ETG 1 – meeting 3) and therefore have not commented on these slides.	The approach to modelling including methodology and sensitivity tests are included in the Marine Physical Processes Modelling Report which is a technical appendix to the Marine Physical Processes Chapter in the PEIR. **PEIR Updated Response** The results of numerical modelling are provided in **Appendix 8.3 Marine Physical Process Modelling Report**.
MMO	ETG1 Meeting 3 (30/10/24)	Does the ETG agree with the approach to suspended sediment dispersion modelling? The MMO has no comments to make as the sediment dispersion modelling is not presented at this meeting. The MMO understand that this will be submitted with the PEIR report in 2025.	**ETG Response** Noted. **PEIR Updated Response** The results of numerical modelling are provided in **Appendix 8.3 Marine Physical Process Modelling Report**.
MMO	ETG1 Meeting 3 (30/10/24)	Does the ETG agree with the approach to coastal erosion and to use the 2070 setback in the assessment? The MMO consider that the approach to coastal erosion is suitable. The MMO consider to be conservative (following the precautionary principle) use of the higher erosion rates would be considered best practice.	**ETG Response** Noted. **PEIR Updated Response** The Coastal Erosion Assessment is presented in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
MMO	ETG1 Meeting 3 (30/10/24)	Does the ETG agree with the approach to coastal erosion and to use the 2070 setback in the assessment? Given the 30-year lifespan of the Projects, the MMO would consider using the 2070 coastline to be appropriate, however the MMO would expect the applicant to consider decommissioning at the PEIR stage and what the associated impacts may have to the coastline beyond 2070 i.e. will any decommissioning works accelerate the erosion rate once project is finished?	**ETG Response** The decommissioning timeframe has not been defined at this stage of the Project. The coastal setback will be reassessed at ES to consider the decommissioning phase of the Project. **PEIR Updated Response** The Coastal Erosion Assessment will be updated at ES to include a decommissioning period of five years which will extend the project lifetime to 2074. The landfall design and methodology considers the results of the Coastal Erosion Assessment and is detailed in the **Volume 1, Chapter 8 Marine Physical Processes**. The Applicant is considering a monitoring plan for coastal erosion following decommissioning to ensure any infrastructure at the landfall does not become exposed. The details of this plan will be confirmed at DCO submission.
Environment Agency	ETG1 Meeting 3 (30/10/24)	A comment in the minutes (Smithic Bank): We will certainly be interested to hear what develops regarding the Smithic Bank. There is potential for having to move very large volumes of sand. Most of the concern about this will be for the function of the sandbank, but there will be ecological implications too.	**ETG Response** Noted. **PEIR Updated Response** The baseline characterisation of Smithic Bank is presented in **Section 8.6.1.11** in **Volume 1, Chapter 8 Marine Physical Processes**. Smithic Bank is assessed as a receptor to cable installation activities in the nearshore in **Section 8.7.2.3.1** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Environment Agency	ETG1 Meeting 3 (30/10/24)	Does the ETG agree with the approach to suspended sediment dispersion modelling? We agree in principle to sediment modelling by MIKE21 in the array area. However, have sediment models closer to the shoreline been implemented, ie what are the sediment pathways from eroding cliffs and foreshore to the nearshore. Does sediment move southwards to Spurn Head or is it moved offshore? And has the function of the Smithic sandbanks been factored into the model?	**ETG Response** Sediment dispersion modelling due to cable installation activities in the nearshore has been undertaken and is presented in the Marine Physical Processes Modelling Report. Sediment transport modelling of the foreshore has not been undertaken as the Project will use a trenchless solution at the landfall which will not affect coastal processes. **PEIR Updated Response** The results of numerical modelling are provided in **Appendix 8.3 Marine Physical Process Modelling Report**. A commitment (CO32) has been made to adopt a trenchless solution for cable installation at the landfall as outlined in **Volume 1, Chapter 4 Project Description**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
Environment Agency	ETG1 Meeting 3 (30/10/24)	Does the ETG agree with the approach to coastal erosion and to use the 2070 setback in the assessment? We agree in principle with the setback measurement for modelling of coastal erosion using Leatherman together with coastal monitoring data from the East Riding of Yorkshire Council (ERYC) combined with historic and future rates of sea-level rise. (As opposed to the sole use of NCERM data). However, has modelling factored in the potential for successive tidal surges, ie where there has been no time for foreshore recovery between storms and where the foreshore might have acted in some way to protect the cliff toe?	**ETG Response** The approach adopted used the empirical equation of Leatherman which used historic coastal erosion data and future sea-level rise predictions. The effects of individual or multiple tide surges on the morphology of the beach cannot be parametrized using empirical approaches. By using a longer time series of coastal monitoring data, the long term affect of short-lived surge events on the coast is captured in the rates of coastal erosion. **PEIR Updated Response** The Coastal Erosion Assessment is presented in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**.
Environment Agency	ETG1 Meeting 3 (30/10/24)	Does the ETG agree with the approach to coastal erosion and to use the 2070 setback in the assessment? It is preferable to use the 2100 setback date as a more robust option at the proposed landfall location. Estimated project lifetimes are likely set as a minimum. Infrastructure is often supported beyond the original anticipated lifetime.	**ETG Response** The Environment Agency suggest that a worst-case scenario of a historic erosion rate of 10m/year should be used in the equation to calculate worst-case future erosion because historically a loss of greater than 10m occurred in a single year. Although we agree that a single annual loss of greater than 10m (with sea-level rise applied) could occur in the future, this scale of loss would likely be related principally to a single catastrophic event that would only occur occasionally over a long period of time rather than on a regular basis in the future (or indeed, it hasn't in the past). Therefore, it is proportionate to use an average worst-case historic rate over a longer period of time to forward project.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
		The landfall compound and cable infrastructure must be placed where the risk of rapid cliff recession affecting the site and hinterland is as low as reasonably possible and this entails using the reasonable worst-case scenario design for 2100. Alternative options would lead to greater risk of cable exposure in the eroding cliff regardless of how deep they are placed deep underneath the fronting nearshore zone. At the landfall site, "rates of cliff erosion averaged at 1.34 m/year based on GPS derived ERYC monitoring data". However, a loss of c10m occurred within a single year in 2020, so predicted rates of regression are still unreliable. Regardless of modelled data a worst-case scenario could actually be equal to >10m a year (with accelerated sea level rise) and not 1.37m. The conclusion (p21) to the Coastal Erosion at the Dogger Bank D Landfall report, Sept 2024, stated that "the coast could potentially retreat by up to 383m by 2070 and 762m by 2100" meaning that a minimum 2100 setback should be utilised.	Using 10m/year would be unrealistic and disproportionate, because a catastrophic event of that size would be unlikely to occur every year at the specific location of the landfall as already shown by the long-term monitoring of the coastline with this data point being an outlier not a common occurrence. With respect to using the 2100 cliff position as the position for set-back estimates, this is disproportionate because the operational life of the Project is 35 years. Assuming construction dates between 2029 and 2034, 35 years hence would be 2069. Then, we assume that decommissioning would take a further year taking the design life of the Project to 2070. Decommissioning would not take 31 years, which would be the case if the 2100 estimate is used. Also, the guidance states that the lifetime of a development does not necessarily need to be 100 years if specific justification for considering a different period can be provided. In this case, a design life up to 2070 is justifiable evidence for using the cliff position in that future year as the position for determining the preferred inland location of landfall infrastructure as already shown by the long-term monitoring of the coastline. **PEIR Updated Response** The Coastal Erosion Assessment is presented in **Section 8.6.1.13** in **Volume 1, Chapter 8 Marine Physical Processes**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
			The Coastal Erosion Assessment will be updated at ES to include a decommissioning period of five years which will extend the project lifetime to 2074.

References

Planning Inspectorate (2023). Scoping Opinion: Proposed Dogger Bank D Wind Farm. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010144/EN010144-000018-EN010144%20-%20Scoping%20Opinion.pdff

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Acronyms

Acronym	Definition
DB	Dogger Bank
DBC	Dogger Bank C
DBD	Dogger Bank D
DBS	Dogger Bank South
DBZ	Dogger Bank Zone
EA	Environment Agency
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
ETG	Expert Topic Group
GPS	Geographical Positioning System
HDD	Horizontal Directional Drilling
HPF	Hydrogen Production Facility
HRA	Habitat Regulations Assessment
IPCC	Intergovernmental Panel on Climate Change
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effects
MCZ	Marine Conservation Zone
MDS	Maximum Design Scenario
MMO	Marine Management Organisation
MPP	Marine Physical Processes
NCERM	National Coastal Erosion Risk Mapping

Acronym	Definition
NE	Natural England
OS	Ordnance Survey
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
PEIR	Preliminary Environment Information Report
RHDHV	Royal HaskoningDHV
RIAA	Report to inform the Appropriate Assessment
SAC	Special Area of Conservation
SMP	Shoreline Management Plan
SSC	Suspended Sediment Concentration
UK	United Kingdon
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
WCS	Worst-case scenario
ZOI	Zone of Influence