DOGGER BANK D WIND FARM

Preliminary Environmental Information Report

Volume 2
Appendix 11.1 Consultation Responses for Fish and Shellfish Ecology

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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.
Development Consent Order (DCO)	A consent required under Section 37 of the Planning Act 2008 to authorise the development of a Nationally Significant Infrastructure Project, which is granted by the relevant Secretary of State following an application to the Planning Inspectorate.
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.
Evidence Plan Process (EPP)	A voluntary consultation process with technical stakeholders which includes a Steering Group and Expert Topic Group (ETG) meetings to encourage upfront agreement on the nature, volume and range of supporting evidence required to inform the EIA and HRA process.
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.
Project Design Envelope	A range of design parameters defined where appropriate to enable the identification and assessment of likely significant effects arising from a project's worst-case scenario. The Project Design Envelope incorporates flexibility and addresses uncertainty in the DCO application and will be further refined during the EIA process.
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.

Term	Definition
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.

11.1 Consultation Responses on Fish and Shellfish Ecology

1. **Volume 1, Chapter 11 Fish and Shellfish Ecology** for the Dogger Bank D Offshore Wind Farm (herein referred to as '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 11 Fish and Shellfish Ecology** and the Applicant's responses in **Table 11.1-1.**

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 11.1-1 Consultation Responses on Fish and Shellfish Ecology

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
MMO	ETG 1 13th September 2023	MMO notes that Particle Size Analysis (PSA) data from grab samples has been collected and will be used to inform the baseline habitat suitability for herring and sandeel, this is appropriate and for the characterisation of herring spawning habitat, MMO recommends that Dogger Bank D follows the method described by MarineSpace (2013a and 2013b). Following these methodologies is of particular importance for the Dogger Bank D OWF as it was acknowledged at the scoping stage that herring spawning grounds and sandeel habitat were present within the project Study Area. These methods use a suite of data to determine potential herring spawning habitat and potential sandeel habitat, including PSA data, British Geological Survey (BGS) data, Regional Seabed Monitoring Plan (RSMP) data, herring larval survey data (for herring assessments), as well as fishing fleet data and scientific publications. This data is methodically layered to generate a single 'heatmap' output.	Noted. Updated methods for sandeel and herring heatmapping set out by MarineSpace (2024) have been followed. For heatmapping methods see **Appendix 11.2 Fish and Shellfish Ecology Technical Report**. Herring and sandeel heatmaps are presented in **Section 11.6.1.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.

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		Further detail of the expected approach, including the most appropriate years of herring larval survey data to be used, was provided in advice at the scoping stage1 and MMO expect that these recommendations are followed.	
MMO	ETG 1 13th September 2023	With regard to the meeting minutes, and accompanying slides, there is no mention of how the UWN modelling contours for the Popper *et al* (2014) threshold will be presented, nor of whether the Dogger Bank D intends to model the 135db threshold for behavioural responses in herring, as per Hawkins *et al* (2014). MMO advises that the modelled noise contours are presented for the thresholds for mortality and potential mortal injury (207 SEL_{cum}), recoverable injury (203 SEL_{cum}), and TTS (186 SEL_{cum}) as per the pile driving threshold guidelines described by Popper *et al* (2014), as well as the unweighted SEL_{SS} 135dB as per Hawkins *et al* (2014), for their maximum design scenario (worst-case scenario). Presentation of these four contours allows the modelled impact ranges to be clearly seen and interpreted. In addition, a 'heat' map should be produced of herring potential spawning habitat over the Study Area, on which the mapped noise contours from appropriate underwater noise modelling can be overlaid to provide an indication of the predicted overlap of noise disturbance with potential spawning ground.	Whilst the Applicant considers that the 135dB SEL_{SS} threshold for behavioural disturbance of herring is highly precautionary due to the fact that this piling sound level will occur tens of kilometers away from a piling location, and therefore the soundwave will lose its impulsivity, it will be included and assessed. It should be noted that the authors Hawkins *et al* (2014) explicitly state that the 135dB SEL_{SS} is not appropriate to use as a threshold for impact assessments. This 135dB SEL_{SS} threshold will only be used in the specific case of assessing the behavioural disturbance of spawning herring, in acknowledgement of the particular sound sensitivity of this species, the sensitivity of spawning activity, and the lack of alternative thresholds. It will not be applied to any other species. The worst-case contours for mortality, recoverable injury, and TTS, derived from Popper *et al* (2014), will be displayed as figures to visualise impact ranges. The

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			135dB SEL_{SS} contour will also be displayed visually, but only referred to in the context of disturbance of spawning herring. Heatmaps with noise contours overlaid are displayed on **Figure 11-13** of **Volume 1, Chapter 11 Fish and Shellfish Ecology.**
MMO	ETG 1 13th September 2023	The Study Area indicated on slide 22 seems somewhat narrow compared to the Study Areas drawn for projects of a similar nature and scale. Nonetheless, MMO appreciates that the boundaries of the four International Council for the Exploration of the Sea (ICES) rectangles surrounding the array equate to a Study Area boundary which is between 60 - 80 kilometres (km) from the closest point of the array. Similarly, distance between the boundary of the Study Area and the indicated export cable scoping area is approximately 15km at its closest point. With this in mind, MMO is content with the use of ICES rectangles to define the fish and shellfish ecology Study Area. MMO would expect a larger Study Area to be used in respect of UWN, given that the impact ranges are likely to exceed the area defined by the ICES rectangles.	A 'wider Study Area' will be included in PEIR, specifically for the assessment of long distance UWN impacts. The size of this wider Study Area will be defined by the worst-case outputs of the UWN modelling, with an appropriate additional buffer added for conservatism. Study Areas, including a Wider Study Area for underwater noise are presented in **Section 11.6.1.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	ETG 1 13th September 2023	With regard to the scoping of impacts for fish, Slide 23 of the meeting slide pack presents a table of potential impacts relevant to benthic ecology, and fish and shellfish ecology receptors. The MMO notes that the screening of potential impacts to fish and fish ecology arising from the project has been adjusted by scoping impacts arising from temporary habitat loss / physical disturbance, and impacts from increased suspended sediment, into all phases of development. In the context of assessing loss of habitat or changes in habitat type with respect to fish ecology, the MMO notes that 'long term' to	The Project will scope habitat loss / alteration into decommissioning. This will be raised at the next ETG meeting and noted that as a loss, the effect begins in operation due to the presence of the infrastructure, and continues after decommissioning. For this reason,

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		'permanent' has been corrected. These were points raised in advice on the scoping report and it is encouraging to see this has been actioned. However, it was highlighted at the scoping stage that permanent habitat loss should be scoped into the decommissioning phase, unless the Dogger Bank D can commit that all project infrastructure will be removed from the seabed at the end of the Project's lifetime. The table on slide 23 indicates that this impact has only been scoped into the operation phase. This should be amended ahead of the PEIR.	to avoid duplication of assessment, this impact will be assessed in full detail in the operation section, and will be referred back to in the decommissioning section of the ES. In reality, the magnitude of impact after decommissioning will likely be comparable or less than the effect assessed in operation depending on the extent of decommissioning achieved, but this will only be considered if commitments are made to infrastructure removal at the point of DCO application. Habitat loss / Alteration is assessed in **Section 11.7.2.2** of **Volume 1, Chapter 11 Fish and Shellfish Ecology.** It is acknowledged that this impact begins in construction and may continue into decommissioning.
MMO	ETG 1 13th September 2023	Given that the Applicant has acknowledged that herring spawning grounds and sandeel habitat occur within the project Study Area, MMO recommends that sediment heating from cables should not be scoped out of further assessment at this stage. MMO believes the potential for sediment heating from cables (particularly export cables) to impact herring and sandeel eggs should be appropriately considered before it can be scoped out.	Recent evidence indicates that the surface temperature difference of operational power cables in comparison to inert sections of the same cable was negligible at a sensitivity level of 0.06°C (Taormina *et al.*, 2018; 2020). This rationale was presented during the Dogger Bank South Scoping and EPP. All stakeholders were content for this issue to be scoped out using that

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			rationale. In addition, modelling of heating for HVDC cables with similar high-voltage specifications as high capacity OWF export cables (525kV) (Brakelmann and Stammen, 2017) suggests that even for a worst-case scenario of bundled high voltage cables, any increases in temperature will be limited to a very narrow band above the cables with negligible lateral heat transfer. The footprint of any effect will therefore be extremely narrow; less than a 1m strip above the cable (although it is not possible to define the area precisely), noting that cables at DBD have a burial depth of 0.5-9m. Indeed, conservative modelling suggests that a cable-induced temperature increase at 20cm below the surface will be below 2oC at cable burial depths greater 0.35 - 0.55m. At cable burial depths over 1.5m, any temperature change at 20cm below the surface is likely to be negligible (Brakelmann and Stammen, 2017). It is important to note that demersal spawned eggs will be surface laid, and therefore located even further away from the buried cable. Surface-laid eggs will be subject to constant heat transfer

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			from water flow, similarly to the surface laid cables where no cable surface heating was observed (Taormina *et al.*, 2018; 2020). The Project Area does not lie at a fringe of the North Sea, meaning that fish, shellfish and benthic biological assemblages are relatively typical of a North Sea environment. In other words, the Project does not coincide with the northern or southern limits of the distributional ranges of species under consideration. For this reason, it is very unlikely that temperature changes will be ecologically significant at a local scale, i.e. the footprint of a heating effect. Since this footprint is so small the potential for population level effects is considered to be negligible. The Applicant considers that the above evidence is sufficient to demonstrate that ecological risks of sediment heating from cables is negligible, However sediment heating effects are considered in **Section 11.7.2.8** of **Volume 1, Chapter 11 Fish and Shellfish Ecology on a precautionary basis**.

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MMO	ETG 1 13th September 2023	It is indicated that potential remobilisation of contaminated sediments will be scoped out if justified by the results of upcoming benthic surveys and that levels of offshore sediment contamination will be determined through ongoing survey campaigns. It is indicated that if contaminant levels fall below guideline thresholds (e.g. Cefas Action Levels) that this impact be scoped out. The MMO considers that remobilisation of contaminated sediments should be scoped in until surveys have been completed. The MMO are unable to comment further until specific data has been provided.	Remobilisation of contaminated sediments is assessed in **Sections 11.7.1.3** and **11.7.2.3** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	Scoping Opinion 2nd August 2024	The MMO does not have any major concerns regarding the scoping out of underwater noise and vibration during the operation phase and agrees that main sources of noise generated during operation come from the wind turbine gearbox and generators, and vessels undertaking maintenance activities so are unlikely to result in physical damage to fish, although some behavioural responses in fish are expected to occur.	Based on feedback from other stakeholders, underwater noise during operation is assessed in **Section 11.7.2.5** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	Scoping Opinion 2nd August 2024	The MMO notes that the proposal to scope out underwater noise and vibration during the operation phase (in Section 7.5.3.3.5) contradicts what is presented in Table 7-12, which shows this impact as being scoped in for all phases. Please can this be clarified.	Based on feedback from other stakeholders, underwater noise during operation is assessed in **Section 11.7.2.5** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	Scoping Opinion 2nd August 2024	The Applicant has recognised the importance of the Dogger Bank as a sandeel habitat and spawning ground, and notes that the species are highly vulnerable to habitat disturbance due to their close affiliation and burrowing nature. The scoping report also notes that the Dogger Bank was an extensive sandeel fishing ground until the recent implementation of a new byelaw which prohibits bottom-trawling in the Dogger Bank Special Area of Conservation (SAC). Given the burrowing nature of sandeels and their vulnerability to habitat disturbance, in respect of Sediment Heating from Export Cables, the MMO requests that sediment heating from cables is scoped into the EIA. This is because it is understood that sandeel burrow to depths of between 20	Sediment heating effects are considered in **Section 11.7.2.8** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.

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		centimetres (cm) to of 50cm for certain species in specific sediment types (Holland *et al.*, 2005 and Rowley, 2008), so there is potential for sandeels to be exposed to the effects of thermal heating in the sediment layers they inhabit, based on the proposed 0.5metres (m) minimum cable burial depth. Therefore, the EIA is required to assess the 'worst-case' scenario that assumes the greatest potentially significant impact in terms of magnitude and significance, which is 0.5m burial. As already stated, sandeel can burrow to this depth, and even deeper, therefore an impact is more than likely and thus an impact pathway is present. further discussions will be required, in order to predict the likelihood of significant effects on the receptor.	
MMO	Scoping Opinion 2nd August 2024	The Applicant is proposing to carry out a desk-based assessment using existing data and publicly available evidence, and this is an acceptable approach. However, the limitations associated with some of the data they are using should be acknowledged within this. For example, the vintage of data collected from fisheries surveys conducted across the former Dogger Bank Zone, and the selectivity of the fishing gear used to describe fish assemblages in Section 443; Callaway *et al* (2002) used a 2m Jennings beam trawl to target epibenthic species which catches small and juvenile fishes but will not adequately target large/adult fish, or pelagic fish. Similarly, otter trawls and epibenthic beam trawls will not adequately target sandeels.	Limitations of data sources used are set out in **Section 11.5.6** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	Scoping Opinion 2nd August 2024	The spawning and nursery grounds of fish found within range of the Study Area have been identified using Coull *et al* (1998) and Ellis *et al* (2012) which are suitable resources. The Applicant will conduct species-specific assessments for Atlantic herring and sandeel as these species have spawning and nursery grounds within the Study Area and are highly sensitive to changes in substrate composition, with herring also being sensitive to underwater noise. The Applicant will use particle size analysis (PSA) data collected from the site-specific benthic surveys, alongside existing available PSA data to inform the baseline suitability for sandeel habitat and herring spawning habitat.	Site specific PSA data has informed the baseline for sandeel and herring, as set out in **Section 11.6.1.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**. Heatmaps of sandeel and herring spawning potential habitat have been produced using a number of spatial data sources, in line with MarineSpace (2024) methods. eDNA data has also been collected to provide evidence of species

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			presence.
MMO	Scoping Opinion 2nd August 2024	The MMO notes that a site specific benthic survey is proposed in 2024. The MMO expects that it is ensured that there is extensive PSA data coverage across the array and the Export Cable Corridor (ECC) which passes through the Banks herring spawning habitat off Flamborough Head. The MMO can review of the survey to provide confirmation of sufficient coverage if this is requested.	Site specific PSA data has informed the baseline for sandeel and herring, as set out in **Section 11.6.1.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**. This includes sampling locations within section of the Offshore ECC that overlaps with the Banks herring spawning grounds. eDNA data has also been collected to provide evidence of species presence.
MMO	Scoping Opinion 2nd August 2024	The MMO notes that it is proposed to follow the methods outlined in MarineSpace 2013a and 2013b to determine areas of suitable sandeel habitat and herring spawning habitat, respectively. Please note that MarineSpace has recently revised these methods using more recent data and the inclusion of new seabed sediment datasets. The MMO requests that the updated MarineSpace methods for the assessments are used; see Reach *et al* (2024) for sandeel and Kyle-Henney *et al* (2024) for herring.	Heatmapping following the updated methods set out by Reach *et al* (2024) for sandeel and Kyle-Henney *et al* (2024) for herring have been used to inform the assessment for sandeel and herring (**Section 11.6.1.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**).

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MMO	Scoping Opinion 2nd August 2024	The MMO also recommends that the sandeel habitat assessment should be supplemented with data from the North Sea Sandeel Survey (NSSS) carried out in Sandeel Area 1r in December each year. This targeted sandeel dredge survey has been carried out since December 2004 and includes a number of stations in and around Dogger Bank. The NSSS data can be downloaded from the International Council for the Exploration of the Sea International Council for the Exploration of the Sea (ICES) at https://datras.ices.dk/Data_products/Download/Download_Data_public.aspx	NSSS survey data has been downloaded on informs the sandeel baseline in **Section 11.6.1.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	Scoping Opinion 2nd August 2024	The MMO notes that mitigation measures for fish have not been identified as this is only a scoping report. The need for mitigation should be determined on the outcomes of the EIA.	Given that no significant adverse impacts are found in **Sections 11.7** and **11.8** of **Chapter 11 Fish and Shellfish Ecology**, no further mitigation beyond the embedded mitigation is proposed. Embedded mitigation measures are set out in **Section 11.4.3.**
MMO	Scoping Opinion 2nd August 2024	The ECC passes through a key part of the Banks herring spawning ground off Flamborough Head. With this in mind, the MMO requests that a robust assessment of the impacts of habitat disturbance to herring spawning habitat along the ECC arising from cable laying activities is provided, as well as the impacts of noise and vibration from construction activities such as piling in the array and at the Offshore Substation Platform OSPs is provided.	The baseline for herring spawning habitat is set out in **Section 11.6.1.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**. This informs the assessments on herring spawning throughout **Section 11.7,** including underwater noise (**Section 11.7.1.4**) and temporary habitat loss / physical disturbance (**Section 11.7.1.1**).

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MMO	Scoping Opinion 2nd August 2024	It is appropriate that the potential impact of underwater noise and vibration during the construction phase on fish and shellfish receptors will be scoped into the EIA.	Noted.
MMO	Scoping Opinion 2nd August 2024	The applicant is proposing to scope out underwater noise and vibration during operation. The report notes that the main source of underwater noise during operation (in addition to ambient noise) originates from the wind turbine gearbox and generator, in addition to any surface vessels undertaking operation and maintenance (O&M) activities. The report states that . "Monitoring studies of underwater noise from operational wind turbines have shown the noise levels from North Hoyle, Scroby Sands, Kentish Flats and Barrow wind farms to be only marginally above ambient noise levels (Stober and Thomsen, 2021). Operational noise impacts are considered highly unlikely to cause physical damage to fish or shellfish species (Nedwell *et al*., 2007a; Nedwell *et al*., 2007b; MMO, 2014) and it follows that any behavioural disturbance would be limited to the area immediately surrounding the wind turbines. Therefore, the potential impact of underwater noise and vibration on fish and shellfish receptors will be scoped out of the EIA." At this stage, the MMO requests that this impact is scoped in to the EIA. While the MMO agrees that physical damage to fish or shellfish species is unlikely, the potential for disturbance and other effects such as masking should be considered.	Underwater noise during operation is assessed in **Section 11.7.2.5** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
Planning Inspectorate	Scoping Opinion 2nd August 2024	The Inspectorate notes the Marine Management Organisation's (MMO) scoping consultation response (Appendix 2 of this Opinion) which details the burrowing nature of sandeels and their vulnerability to habitat disturbance, in respect of sediment heating from export cables. The Inspectorate agrees to scope this matter out for construction and decommissioning but in view of the potential impacts to sandeels, does not agree to scope this matter out for operation The ES should include an operation phase assessment of this matter or evidence demonstrating agreement with the relevant consultation bodies and the absence of a LSE.	Sediment heating effects are considered in **Section 11.7.2.8** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.

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Planning Inspectorate	Scoping Opinion 2nd August 2024	Scoping Report paragraphs 486 to 488 cite studies from 2007 and 2014 to support the assertion that operational noise and vibration from wind farms does not impact fish and shellfish species. However, wind turbine output and size has increased since this time. Reference is also made to a study from 2021 but the turbine output assessed in this study (10MW) is less than those anticipated to be delivered for the Proposed Development (14 to 27MW; Scoping Report paragraph 110). In the absence of evidence that the proposed turbines would have comparable noise outputs to those considered in the 2007 and 2014 studies, the Inspectorate is not in a position to agree to scope this matter out from the assessment. The ES should include an assessment of this matter or evidence demonstrating agreement with the relevant consultation bodies and the absence of a LSE. The Inspectorate notes that section 7.5.3.3.5 contradicts Table 7-12 which shows the impacts of underwater noise and vibration as scoped in for all phases. This should be clarified and the Applicant should ensure that the ES is consistent throughout.	Underwater noise during operation is assessed in **Section 11.7.2.5** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
Planning Inspectorate	Scoping Opinion 2nd August 2024	Scoping Report paragraph 455 states that impacts spanning the life of the Proposed Development, such as long-term habitat loss, will be considered as part of the operational phase and therefore, this is scoped out for construction. Temporary habitat loss/ physical disturbance because of construction is proposed to be scoped into the ES. The Inspectorate agrees with this approach.	Noted.
Planning Inspectorate	Scoping Opinion 2nd August 2024	For the reasons set out in row ID 3.2.2 above, the Inspectorate agrees this matter can be scoped out.	Noted.
Planning Inspectorate	Scoping Opinion 2nd August 2024	On the basis that cables would not be live until the beginning of operation, the Inspectorate agrees to scope out impacts from EMF from the offshore operational cables during construction and decommissioning, as there would be no pathway for effect.	Noted.

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Planning Inspectorate	Scoping Opinion 2nd August 2024	The Inspectorate agrees this matter can be scoped out for the construction phase due to the introduced substrate not yet being present.	Noted.
Planning Inspectorate	Scoping Opinion 2nd August 2024	Impacts could occur from installation/ removal during construction and decommissioning and use of lubricants and chemicals for maintenance during operation. Standard best practice measures are proposed to be secured through the PEMP and the project would be required to adhere to control measures under the MARPOL Convention Regulations. On this basis, the Inspectorate agrees that this matter can be scoped out. The ES should explain where appropriate control and best practice measures to reduce/ avoid potential pollution events are secured through the dDCO or other legal mechanism, for all phases of the Proposed Development.	Embedded mitigation measures, and how they are proposed to be secured, are set out in **Section 11.4.3** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
Planning Inspectorate	Scoping Opinion 2nd August 2024	The Inspectorate notes that separate Marine Licence application(s) will be made prior to construction for UXO investigation and clearance works, with an accompanying assessment of UXO clearance impacts on relevant receptors. The Scoping Report states that any assessments for UXO clearance in the EIA will be for information only and are not part of the DCO application. The Inspectorate understands that the number, type and size of UXO devices is not known at this stage and that a detailed UXO survey will be conducted prior to construction. The Inspectorate advises that the ES should still include a high-level assessment in relevant aspect chapters based on a likely worst-case scenario (any assumptions used in the definition of the worst-case scenario should be explained in the ES). The ES should address any cumulative effects from the construction of the Proposed Development with the likely effects from the UXO clearance.	A high-level assessment of UXO impact ranges is set out in **Section 11.7.1.4** and **Section 11.8.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**, for information. A full UXO assessment will accompany ML applications for clearance, once the number, type, and size of UXO in the Project area are known.
Planning	Scoping Opinion	Scoping Report paragraph 519 states that liaison with key stakeholders will take place to agree the approach to data collection. The Inspectorate advises	Comments from the MMO and EA are captured in this table, with

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Inspectorate	2nd August 2024	that consultation with key stakeholders should also seek agreement on wider matters such as the assessment methodology and identification of receptors and potential impacts. The Applicants attention is drawn to the EA and MMO's scoping consultation responses (Appendix 2 of this Opinion), regarding the consideration of mobile/ migratory species and the impacts of habitat disturbance to herring spawning habitat along the offshore ECC, and impacts of noise and vibration from construction activities in the array area and the Offshore Substation Platform(s).	information on the Applicant's response.
Environment Agency	Scoping Opinion 2nd August 2024	The full list of fish species that form part of the designation for the Humber Estuary Special Area of Conservation (SAC) has not been included and key migratory species have not been considered. The following fish species should be added to the Humber Estuary SAC list as follows; allis shad (Alosa alosa) and Twait shad (Alosa fallax). You should ensure you also consider legislation such as The Salmon and Freshwater Fisheries Act 1975 and The Eels (England and Wales) Regulations 2009.	Diadromous fish are considered in **Section** Error! Reference source n ot found. of **Volume 1, Chapter 11 Fish and Shellfish Ecology** and throughout the assessment in **Section 11.7**. It is the Applicant's understanding that allis shad and Twaite shad are not designated features of the Humber Estuary SAC.
Environment Agency	Scoping Opinion 2nd August 2024	"In respect to the proposed assessment approach, we would expect that a Water Framework Directive (WFD) compliance assessment be completed for the offshore works, as set out in National Policy Statement (NPS) EN-1 4, section 5.16. Please also see Advice Note 185 for further information on how WFD should be considered. The WFD assessment should: • Consider the impact of the proposal on the WFD status of the Yorkshire South • Coastal waterbody (GB640402491000) and any linked water bodies • Identify all potential risks to the following receptors: hydromorphology, biology – habitats, biology – fish, water quality, WFD protected areas and	A Water Framework Directive (WFD) assessment has been carried out for the Project and is set out in **Volume 2, Appendix 21.4 Water Environment Regulations Compliance Assessment.**

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
		invasive non-native species • Ensure that there is no deterioration resulting from the proposed activities • Demonstrate how the development/activity will avoid adverse impacts • Describe how any identified impacts will be mitigated for or suggest compensation for loss Guidance on how to assess the impact to WFD is available on Gov.uk https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters"	
Environment Agency	Scoping Opinion 2nd August 2024	Para 5.4.22 of NPS EN-1 states that "the design of Energy NSIP proposals will need to consider the movement of mobile / migratory species such as birds, fish and marine and terrestrial mammals and their potential to interact with infrastructure". Eel, salmonid and lamprey species have not been included as receptors. Potential impacts from the development on these migratory fish species may not be assessed and would therefore not be considered a likely significant effect within the ES and/or Habitat Regulations Assessment (HRA). The ES should include eels, salmonid and sea lamprey as being present within the Study Area. They also form part of the designation for the Humber Estuary SAC, so any impacts from the development should be screened at Stage 1 assessment of an HRA and submitted as part of the Development Consent Order (DCO).	The diadromous fish baseline is set out in **Section 11.6.1.8** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**, and they are considered throughout assessment in **Section 11.7**. SACs designated for fish species are also considered in **RIAA (document reference 5.3)**.
Environment Agency	Scoping Opinion 2nd August 2024	Subsequently, the potential impact from dredging activities on European eel has not been included in the scope. Certain methods of dredging can have negative impacts on eel. Such methods are water-injection dredging and pump-suction dredging. A method statement will be required to allow the Environment Agency to assess whether the Eels Regulations (2009) apply to the proposed dredging operation. If we determine that the Eels Regulations do apply, the operator must fit a screen of appropriate specifications of hold an Exemption Notice under Section 17(5)(a) of the Eels (England and Wales) Regulations 2009, in order to operate the equipment in compliance with the	The Applicant will engage with the Environment Agency to understand the extent to which the Eels Regulations (2009) may apply to Project construction activities in the inshore region.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
		Regulations.	
Natural England	Scoping Opinion 2nd August 2024	Natural England will defer to Cefas' advice on this topic.	Noted.
Natural England	ETG 1 30th October 2024 Q: Does the ETG agree with the approach to underwater noise modelling for fish and shellfish receptors?	Natural England will defer to the advice of Cefas in this matter but reserves the right to comment in the future.	Noted.
Natural England	ETG 1 30th October 2024 Q: Does the ETG agree with the approach to Herring and Sandeel Heat mapping?	Natural England will defer to the advice of Cefas in this matter but reserves the right to comment in the future.	Noted.
MMO	ETG 1 30th October 2024 Does the ETG agree with assessing habitat loss/alteration due to seabed	Fish The MMO welcome that the impacts of sediment heating of fisheries and fish ecology will now be included in the assessment. The proposed approach to assessment will be through an appraisal of available literature, which is appropriate. The MMO have provided previous scoping advice which cites literature for inclusion (sent 22 July 2024)	Sediment heating effects are considered in **Section 11.7.2.8** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
	infrastructure in detail for the operational phase with sign posts to construction and decommissioning to avoid duplication in the chapter?	Shellfish The MMO agree with the approach as presented within the reviewed documents on assessing sediment heating from cables. The approach presented is to provide an assessment based on the appraisal of available literature.	
MMO	ETG 1 30th October 2024 Does the ETG agree with assessing habitat loss/alteration due to seabed infrastructure in detail for the operational phase with sign posts to construction and decommissioning to avoid duplication in the chapter?	Fish During the meeting it was advised that the impact of habitat loss due to the placement of seabed infrastructure will only be assessed for the operational phase. The MMO are generally in agreement with this approach and agree that signposting from the construction and decommissioning stage assessments to the assessment for the operational stage will avoid duplication. Please note that unless the Applicant can offer assurance that all seabed infrastructure will be removed at the end of the project's lifetime, then the impact of habitat loss must be considered permanent in the operational and decommissioning stages. Shellfish The MMO agree with the approach as presented within the reviewed documents on assessing habitat loss/alternation. The approach is to fully assess this impact in detail within the operational phase only and then to sign post to the operational phase from other development stages.	Habitat loss/alteration is considered in **Section 11.7.2.2** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	ETG 1 30th October 2024 Does the ETG	The MMO generally agree with this approach, but note that in the case of Atlantic herring spawning grounds a threshold of 135 dB single-strike sound exposure level will be the metric used in the modelling.	Whilst the Applicant considers that the 135dB SEL_{SS} threshold for behavioural disturbance of herring is highly precautionary due to the

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
	agree with the basis of the underwater noise assessments will be the worst case impact ranges on Monopile SPLpeak and Pin piles SELcum?		fact that this piling sound level will occur tens of kilometers away from a piling location, and therefore the soundwave will lose its impulsivity, it is included and assessed. It should be noted that the authors Hawkins et al (2014) explicitly state that the 135dB SEL_{SS} threshold is not appropriate for use in impact assessments. This 135dB SEL_{SS} threshold will only be used in the specific case of assessing the behavioural disturbance of spawning herring, in acknowledgement of the particular sound sensitivity of this species, the sensitivity of spawning activity, and the lack of alternative thresholds. It is not applied to any other species. The worst-case contours for mortality, recoverable injury, and TTS, derived from Popper et al (2014), are displayed as figures to visualise impact ranges. The 135dB SEL_{SS} contour will also be displayed visually, but only referred to in the context of disturbance of spawning herring.
MMO	ETG 1 30th October 2024	The MMO support the use of Kyle-Henney et al. (2024) for mapping potential herring spawning habitat and support the use of Reach et al. (2024) for	Noted, these methods are used to produce the sandeel and herring heatmaps, **Section 11.6.1.3.1** of

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	Does the ETG agree with using MarineSpace 2024 methods for heatmapping herring spawning and sandeel habitats?	mapping sandeel habitat suitability. However, in reference to the data sources listed in Slide 31 ('Approach to Herring and Sandeel Heatmapping'; Paragraph 5) the MMO have provided some additional comments below.	**Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	ETG 1 30th October 2024 Does the ETG agree with using MarineSpace 2024 methods for heatmapping herring spawning and sandeel habitats?	5 years of EMODnet demersal fishing effort data (for sandeel) and pelagic fishing effort data (for herring) will be used in the heatmapping methods. Please note that fishing effort data is acquired from the automatic identification system (AIS) / vessel monitoring system (VMS) database, rather than EMODnet.	VMS data from the MMO has been used to represent fishing effort, as set out in **Appendix 11.2 Fish and Shellfish Ecology Technical Report**.
MMO	ETG 1 30th October 2024 Does the ETG agree with using MarineSpace 2024 methods for heatmapping herring spawning and sandeel habitats?	The MMO recommend that 10 years (rather than 5 years) of VMS data are used in the heatmaps for herring and sandeel. This is especially relevant to the sandeel habitat assessment, given the recent closure of the Dogger Bank SAC to bottom trawling, which will result in an absence of data for recent years.	10 years of VMS data from the MMO has been used to represent fishing effort, as set out in **Appendix 11.2 Fish and Shellfish Ecology Technical Report**.

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MMO	ETG 1 30th October 2024 Does the ETG agree with using MarineSpace 2024 methods for heatmapping herring spawning and sandeel habitats?	ICES North Sea Sandeel Survey (NSSS) data will be used in the heatmapping method for sandeel. Please note that this data cannot be incorporated into the heatmap as it does not form part of the method, so cannot be assigned a confidence score. The MMO support that the NSSS data will be used, but this data should be considered as information to supplement the heatmap outputs. NSSS data provides information on sandeel abundance, whereas the sandeel heatmapping method provides information on sandeel habitat suitability.	Noted. NSSS data has not been used in heatmap production and instead provides context to the baseline **Section 11.6.1.3.1** of **Volume 1, Chapter 11 Fish and Shellfish Ecology**.
MMO	ETG 1 30th October 2024 Does the ETG agree with using MarineSpace 2024 methods for heatmapping herring spawning and sandeel habitats?	Cefas OneBenthic data are being 'considered' for use in the heatmaps for herring and sandeel. Please note that Cefas OneBenthic Macrofaunal Assemblages data form an integral part of these methods so must be included to follow the methods properly.	Cefas OneBenthic data has been used in the heatmaps following MarineSpace methods, as set out in as set out in **Appendix 11.2 Fish and Shellfish Ecology Technical Report**.

Stakeholder	Document / Meeting, Date	Comment	How and Where Addressed in the PEIR
MMO	ETG 1 30th October 2024 Does the ETG agree with using MarineSpace 2024 methods for heatmapping herring spawning and sandeel habitats?	For sandeel, Cefas OneBenthic Sandeel Presence data are also available. The data have been acquired from grab, core and trawl sampling and provide point data on locations where sandeel have been caught using these sampling methods. The MMO recommend that the Applicant refers to Appendix C of KyleHenney et al. (2024) and Reach et al. (2024) to assist them in the use and interpretation of the various datasets that are used in the heatmapping methods.	Cefas OneBenthic data has been used in the heatmaps following MarineSpace methods, as set out in as set out in **Appendix 11.2 Fish and Shellfish Ecology Technical Report**.

References

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List of Acronyms

Acronym	Definition
AIS	Automatic Identification System
BGS	British Geological Survey
DBD	Dogger Bank D
DCO	Development Consent Order
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Topic Group
HRA	Habitat Regulations Assessment
ICES	International Council for the Exploration of the Sea
LSE	Likely Significant Effect
ML	Marine Licence
MMO	Marine Management Organisation
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NSSS	North Sea Sandeel Survey
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Impact Report
PEMP	Project Environmental Management Plan
PSA	Particle Size Analysis

RIAA	Report to Inform Appropriate Assessment
RSMP	Regional Seabed Monitoring Plan
SAC	Special Area of Conservation
UXO	Unexploded Ordnance
VMS	Vessel Monitoring System
WFD	Water Framework Directive