Hornsea Project Four

Applicant's Response to RFI dated 16 December

Request for Further Information
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Revision Summary

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1 Introduction

1.1.1.1 The Department for Business, Energy and Industrial Strategy issued a Request for Information to the Applicant and other stakeholders with regards to Orsted Hornsea Project Four on 16 December 2022. The Applicant has reviewed this request and below provides responses to the specific queries raised.

Reference	BEIS request	Applicant's Response
3	With regard to the powers sought by the Applicant in relation to Crown Land and/or Crown rights, the Secretary of State requests that the Applicant and The Crown Estate provide confirmation that the necessary Crown authority's consent has been obtained. References should be consistent with the most up to date version of the Book of Reference. In the event that the necessary authority from the Crown Estate were not to be obtained, the Applicant should advise as to what the implications of this would be for the proposed Hornsea Project Four if the affected land were to be removed (as set out in the latest version of the Book of Reference).	The Applicant can confirm that the necessary Crown Authority's consent has been obtained. The Applicant and the Crown Estate Commissioners entered into an Agreement on 13 January 2023 and a letter of consent from the Crown Estate Commissioners pursuant to section 135 of the Planning Act 2008 has been submitted by email to hornseaprojectfour@planninginspectorate.gov.uk.
4	The Secretary of State notes that the Book of Reference lists 'The Queen's Most Excellent Majesty in the Right of Her Crown' as the owner and/ or occupier in relation to plots 1, 2, 3, 4, 5 and 6. The Applicant should provide an updated Book of Reference that refers to His Majesty the King, i.e. 'The King's Most Excellent Majesty in the Right of His Crown'.	The Applicant has provided an updated Book of Reference with this submission. Please see **E1.3 Book of Reference**.
5	The Secretary of State understands that at the close of the Examination, there remained disagreement between the Applicant and bp in relation to the protective provisions in the draft Development Consent Order ("DCO") for the benefit of the carbon store licensee of bp's Endurance Store Project.	
6	Both the Applicant and bp should provide an update on the position in relation to these protective provisions. The Secretary of State understands that key areas of disagreement in relation to the protective provisions relate to: a) whether or not there should be an exclusion area and notification area, b) whether or not the interface agreement should be retained, and c) the period of time after which the provisions for the benefit of the carbon store licensee would fall away. The responses provided by the Applicant and bp should include updates on each of these matters.	The position of the parties remains unchanged from that at the end of the examination. Accordingly, there is no further update in respect of points (a) – (c) inclusive. In summary and taking the specific points in turn: (a) The Applicant maintains that there should not be an exclusion area or notification area imposed by the Secretary of State as co-existence remains a viable option. The Applicant's proposed protective provisions allow for ongoing discussions to find a technical solution to the issue of co-existence. These discussions are proposed within practical timescales to allow the Applicant to optimise the windfarm layout if bp cannot demonstrate sufficient progress of the offshore applications relating to the Endurance CO2 Store.

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		(b) The Applicant maintains its position that the Interface Agreement sets the appropriate mechanism for assessing compensation, and that these provisions should not be set aside because bp consider that the terms and aims of that agreement are not in their commercial interests. This is particularly relevant in light of the subsequent Deed of Adherence that bp entered into on 10th February 2021. The compensation due under the Interface Agreement is a contractual matter, which bp has tried to conflate into a planning matter. To use a DCO in this manner would amount to an abuse of process. (c) The timescale of 4 months is necessary and appropriate as it provides the Applicant with the opportunity to optimise the layout of the windfarm project rather than designing the layout to exclude the area on the premise that it might be utilised for carbon capture and storage. The uncertainty as to the extent of the overlap area required for carbon capture and the relative lack of progress of the CCUS related offshore applications should be weighed against the opportunity to maximise the capacity of Hornsea Four and its importance in terms of the contribution to decarbonisation. The timescale proposed was informed by the intended submission dates for the key consents communicated and relied upon by bp during Examination. The consents being referred to are (a) submission of the Environmental Statement to OPRED; and (b) the application for a store permit to the North Sea Transition Authority. At Deadline 3 of the Examination, bp advised that the intended date of these submissions was September 2022 and November 2022 respectively (paragraph 2.2. of PDF page 83 and paragraph 5.1 of PDF page 89 of REP3-047 BP Exploration Operating Company Limited Deadline 3 Submission), although it it's now understood that the applications will be submitted early in 2023. The Applicant also notes that the Zero Carbon Humber project which forms part of the East Coast Cluster has also not progressed to the application stage. The Applicant is aware that representations have been made that the Zero Carbon Humber project is required to optimise the carbon storage capacity of the Endurance Store.

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		It is of course open to the Secretary of State to extend this time period when deciding whether to grant the DCO, although any such longer period should not put at risk the Applicant's ability to compete in future CFD auction rounds, nor subsequently put at risk the ability to construct and energise Hornsea Four by 2030. bp has raised concerns about paragraph 2 of the Applicant's protective provisions, which reads: *"2. In the event that –* *(a) the licence is terminated and no longer has effect;* *(b) the consents required to develop the NEP Project are not obtained within four months of the coming into force of this Order; or* *(c) the licensee has not undertaken and completed the evaluation and shared that with the undertaker,* *the obligations on the undertaker in this Part of this Schedule shall no longer have effect."* The consents referred to in 2(b) are those bp referenced throughout the examination, namely: (a) submission of the Environmental Statement to OPRED; and (b) the application for a store permit to the North Sea Transition Authority. The reference to "evaluation" in 2(c) is defined in paragraph 3 of the Applicant's protective provisions included in the last version of the draft DCO submitted to the examination at Deadline 7 (**REP7-039**), which reads: *""evaluation" means a Value of Information study, including but not limited to—* *(a) comprehensive evaluation of different seismic acquisition and processing techniques and survey designs, using forward modelling to investigate the impact on imaging from seabed to Bunter, and the ability to monitor the spread of the CO2 plume;* *(b) field trials investigating the sand waves on the seabed and an assessment of the potential for those to impact on the use of ocean bottom seismic acquisition systems to monitor the spread of the CO2 plume;*

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		(c) investigation and assessment of the potential acoustic noise of an operating wind farm and the potential impact of that on the quality of seismic data recorded during 3D seismic surveys; *(d) an evaluation of the financial feasibility of acquiring two baseline surveys, one with towed streamer and the other with ocean bottom seismic acquisition systems, with the objective of achieving the greatest flexibility for future CO2 monitoring in the overlap zone;* *(e) field trials to determine the appropriate size of exclusion zone required in respect of the vessels deployed on the NEP Project."* The time limit for submitting the evaluation to the Applicant is the four month period referred to in paragraph 2. The Applicant believes that its protective provisions are clear and well understood by bp on the face of the terms offered and in the context of the examination. It is worth noting that bp, assisted by its legal advisors, had ample opportunity to make detailed submissions on the Applicant's protective provisions, including paragraph 2, during the examination, but chose not to do so, preferring instead to make the case for its own protective provisions. Moreover, during the examination the examining authority asked bp for comments on the Applicant's protective provisions if needs be on a without prejudice basis. The concerns raised now, in the context of an implied request for an extension of time for the determination of the DCO application for Hornsea Four and to provide further comment on the Applicant's protective provisions, amount to a veiled strategy to delay the grant of consent for Hornsea Four. There is no good justification for delaying the determination of the DCO application for Hornsea Four. Even so, and without prejudice to the Applicant's view that its protective provisions, including paragraph 2, are sufficiently clear, if the Secretary of State thinks it would aid interpretation of paragraph 2, it could be amended to read as follows: *"2. In the event that –*

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		(a) the licence is terminated and no longer has effect; or *(b) within four months of the coming into force of this Order, NEP Project Consents have not been granted and/or the licensee has not undertaken and completed the evaluation and shared that with the undertaker, the obligations on the undertaker in this Part of this Schedule shall no longer have effect."* *A new definition of "NEP Project Consents" would be required to support the above amendments to paragraph 2, which could read, "means the approval of the Environmental Statement for the NEP Project by OPRED and the grant of a store permit for the NEP Project by the North Sea Transition Authority".* bp is correct that there is no operative provision in the Applicant's protective provisions, which provides for the Secretary of State to make a determination of the requirement or otherwise for an exclusion area. The reason for this is twofold: (a) it is the Applicant's case that an exclusion area is not justified; and (b) if the Secretary of State decides that an exclusion area is justified, then drafting and associated plans for that purpose were submitted to the examination by bp, and commented on by the Applicant.
7	The Secretary of State notes that bp has submitted a document titled 'bp's update to SoS' dated 8 December 2022. The Applicant may wish to comment on the content of this document. The document has been published on the Planning Inspectorate's project page for Hornsea Project Four and can be accessed at this link: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010098/EN010098-002227-BP%20-%20submission%20to%20SoS%20-%20Final.pdf	Thank you for the opportunity to respond to bp's submission to the Secretary of State (dated 8 December 2022). We do not consider that this submission in any way alters the position at the end of the examination – the submission largely repeats points made during examination. The Applicant's position as set out during the Hornsea Project Four examination remains the same, in summary: (i) The protective provisions offered by the Applicant for the benefit of bp are proportionate and appropriate; (ii) The protective provisions proposed by bp are not proportionate, are not appropriate and would require Crown consent under section 135(2) of the Planning Act 2008 which, rightly in our submission, has not been forthcoming. We would also like to make one clarification in respect of bp's submission. At paragraph 2.7 of bp's submission to the Secretary of State (dated 8 December

Reference	BEIS request	Applicant's Response
		2022), bp has extracted and highlighted a statement from the Applicant's Deadline 12 response to the NZT DCO Examination (paragraph 3.2.6). The statement highlighted was a part of Orsted's response to the NZT Applicant's statement that "The further JMKC [James Maurici KC] Submissions do not dispute that on the evidence before the Secretary of State the terms of the IA [Interface Agreement] pose a real and significant risk to the ECC Plan, nor that there is substantial public interest in the ECC Plan proceeding." It should be noted firstly that our primary position, which accords with policy, is that co-existence is possible and should be given every opportunity – a position which can be achieved through the Applicant's proposed protective provisions for the benefit of bp (and the proposed protective provisions for its benefit within the Net Zero Teeside Development Consent Order). The Applicant has been consistent in acknowledging that both CCUS and offshore wind are of critical importance to both the UK's green recovery plan and the national need to meet Net Zero commitments by 2050. **The point being made in the statement extracted and highlighted by bp was that, even if it could be demonstrated that physical co-existence was not possible immediately (which we dispute)** - in the context of the evidence before the Secretary of State, taking into account the submissions by bp in the Hornsea Project Four examination and by Net Zero Teesside Power Limited and Net Zero North Sea Storage Limited (together, the NZT Applicant) in the Net Zero Teesside DCO examination, **the need for interference with the Applicant's rights under the European Convention on Human Rights in order to realise the benefits of CCUS has not been established by bp.** It is clear from the submissions that have been made that the exclusion area is not required for the NZT generating station or for the offshore elements of the project associated with the NZT generating station (as set out in the NZT Applicant's submissions to the NZT DCO examination (for example see NZT Examination submissions **REP1-035 electronic page 173** attached at **Appendix A, REP4-030 electronic page 9** attached at **Appendix B**).

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		Further, if and when the remainder of the exclusion area would be required remains uncertain. As noted above the Endurance Store offshore applications are yet to be submitted, and the Zero Carbon Humber project which forms part of the East Coast Cluster and is proposed to transport CO2 to the Endurance Store has also not progressed to the application stage. The NZT Applicant has stated that it is working with the North Sea Transition Authority to appraise alternative stores to increase capacity available for storing captured carbon dioxide. The North Sea Transition Authority issued carbon dioxide storage licences to bp and Equinor in relation to further storage sites, all in the Southern North Sea and in the same area as the Endurance store (as confirmed by the NZT Applicant in the NZT Examination **REP1-035 electronic page 12** attached at **Appendix A**). In addition, it has not been demonstrated that the Interface Agreement would operate as a barrier to carbon storage within the exclusion area. An assertion by bp that if the Interface Agreement remains in place, "it is likely that NEP would elect not to propose utilising the part of the Endurance Store within the Exclusion Area", does not amount to evidence that the ECC plan (or a future CCS project wishing to use the exclusion area) would be rendered unviable. We would also direct the Secretary of State to the full submissions by James Maurici KC (**NZT Examination REP2-092** attached at **Appendix C** and **REP9-032 Annex 1 of bp's submission to the Secretary of State** (dated 8 December 2022)
8	The Secretary of State understands that at the close of the Examination, there remained disagreement between the Applicant and Bridge as to the protective provisions proposed by the Applicant in the draft DCO for the benefit of Bridge.	
9	The Applicant and Bridge are asked to provide an update as to whether protective provisions are now agreed between them or what matters remain outstanding. If agreement has not been reached Bridge is asked to provide alternative protective provisions which would address any remaining concerns.	The Applicant submits that protective provisions are no longer required to protect the potential development in this area as Licence P2426 has been relinquished by Bridge. The Licence block has not been awarded as yet to another party. As matters stand therefore no protective provisions should be included in the DCO.
10	In particular, Bridge is asked to submit, with reasons, a timeframe that it would find acceptable for committing to the proposed location of its pipeline.	

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11	The Secretary of State understands that at the close of the Examination, there remained disagreement between the Applicant and NEO as to the protective provisions proposed by the Applicant in the draft DCO for the benefit of NEO.	
12	NEO and the Applicant are asked to provide an update as to whether protective provisions are now agreed or what matters remain outstanding. In particular, the Applicant and NEO are asked to confirm whether protective provisions have been agreed regarding the use of helicopters and compensation for any additional associated costs, thereby potentially enabling the radius of any 'restricted area' proposed by NEO to be reduced.	The position of the parties remains unchanged from that at the end of the examination. Accordingly, there is no further update in respect of helicopter operations or NEO's representations that compensation is due for any additional costs that may be incurred by NEO. The Applicant remains confident that a distance of 2.7 nm from the Babbage Platform to the tip of the nearest turbine allows NEO to undertake safe helicopter operations. As noted in the Schedule of Agreements (REP8-008) the Applicant has entered into a Co-operation and Co-existence Agreement relating to the Ravenspurn North platform which includes a 2.7 nm buffer around the Ravenspurn North platform. (It should be noted that the Ravenspurn North platform is a manned platform whereas the Babbage Platform is a cyclically manned platform). NEO also conceded at REP6-061 that a radius of 2.7nm was a safe distance to undertake helicopter operations. The Applicant reiterates their position as at REP8-014 that commercially the Applicant does not consider compensation is due as any financial impact would be de-minimis and should be absorbed by NEO in the usual course of operations. Paragraph 1.2.1.2 of REP8-014 summarises the very minor impact of Hornsea Four.
13	The Secretary of State understands that at the close of the Examination, there remained disagreement between the Applicant and Harbour Energy as to the protective provisions proposed in the draft DCO for the benefit of Harbour Energy.	
14	Harbour Energy and the Applicant are asked to provide an update as to whether protective provisions are now agreed or what matters remain outstanding. In particular, Harbour Energy and the Applicant are asked to confirm whether protective provisions have been agreed that would secure the use of and compensate for any additional associated costs, potentially enabling the use of 800m-wide aviation access corridors and a smaller wind turbine exclusion zone as sought by the Applicant.	The position of the parties remains unchanged from that at the end of the examination. Accordingly, there is no further update in respect of helicopter operations or the representations made by Harbour that compensation is due. There will continue to be dialogue between the Parties due to the location of the wellheads and it is anticipated that a proximity agreement will be required prior to construction of the windfarm. To clarify, the protective provisions proposed by the Applicant include an **800m** wide access corridor and a **900m** radius from the centre of the two wellheads,

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		both free from obstructions. As presented at paragraph 1.3.1.1. to 1.3.1.4 of REP8-015 the Applicant submits that this is a safe distance within which to operate helicopters due to the precedent set by the Hornsea One and Hornsea Two windfarms. The Hornsea Two Operations Manager has reiterated that they operate daily flights with two landings a day at the Hornsea Two offshore substation platform. As referred in previous submissions Hornsea Two does not have a designated access corridor and the nearest wind turbine generator tip is a distance of 910m from the platform. The flights are conducted safely under the same operating regulations as will apply to any helideck located over the Johnston Wellheads using the standard Southern North Sea helicopter, the AW139. (The AW139 is the helicopter used by all operators in the southern North Sea (including Harbour) to fly to gas platforms and rigs). The Applicant's final position was summarised in the cover letter dated 22nd August 2022 (G8.12) Regarding any requirement for compensation, as noted above there will be ongoing dialogue with Harbour to ensure the timely installation and operation of the windfarm and decommissioning of the wellheads. The decommissioning activities will occur over a short timeframe of 6 to 9 months. Harbour at this stage cannot confirm when they will decommission or indeed the time of year (summer or winter) they will decommission. Both parties will work closely to ensure the impact of their works and operations upon the other party are minimised including the timing of those works. As noted in the Applicants final cover letter (G8.12) the Applicant maintains that synergies could be achieved with Harbour regarding helicopter access if their current helicopter operator is not able to fulfil this service. The Applicant's proposed protective provisions allow for the safe decommissioning of the wellheads but it must be acknowledged that technological advances including in the size of wind turbines, the optimisation of the layout and the potential for rig-less decommissioning means that it is key that dialogue continues. This dialogue is needed to ensure best practice is utilised by both parties should decommissioning occur during construction or operation of the windfarm. In such circumstances both parties will mitigate their potential impacts upon the other.

Reference	BEIS request	Applicant's Response
15	The MMO and the Applicant are asked to provide an update on the position relating to sediment sample particle size analysis. The Secretary of State understands that these samples had been re-analysed although the MMO had not yet had an opportunity to comment. The MMO is asked to provide confirmation of whether it is content with the re-analysis and if it still requires a condition in the deemed marine licence.	The Applicant was informed on 12 January 2023 that the MMO is now satisfied there is no longer a need for a condition to be included within the DML.
16	The Applicant is asked to provide a signed version of the Statement of Common Ground with National Highways.	The Applicant has provided a signed version of **F3.3 Statement of Common Ground between Hornsea Project Four and National Highways** with this submission.
17	The Environment Agency is asked to confirm whether their objection to the project following agreement of protective provisions with the Applicant has been withdrawn.	
18	In relation to in-combination impacts on the kittiwake, razorbill, guillemot, gannet, and the seabird assemblage features of the Flamborough and Filey Coast SPA, the Applicant is requested to provide updated in-combination assessments for collision and/or displacement effects, using the latest figures from the Sheringham Extension, Dudgeon Extension and Rampion 2 projects; and provide updated PVA models for all the above features and counterfactuals (including CFGR and CFPS) for the SPA population. All models should use Natural England's advised assessment parameters and ranges, and include all consented projects, including those where compensation measures have been agreed.	<u>Updated FFC SPA In-combination impact tables (Appendix D)</u> The Applicant has undertaken a review and updated (where applicable) the in-combination assessment totals as presented within Appendix D for kittiwake, razorbill, guillemot, gannet, and the seabird assemblage (puffin) features of the Flamborough and Filey Coast SPA. These updated totals include the latest figures from the Sheringham and Dudgeon Extension project's DCO Applications (Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects Report to Inform Appropriate Assessment (RIAA). Equinor, 2022). The Applicant also reviewed the latest numbers for the Rampion 2 project, which remain unchanged since the close of Hornsea Four Examination **(REP8-017)**, as Rampion 2 is not due to submit its DCO Application until later in 2023. Following the same methods of providing impact assessments in consistency with all previous Hornsea Four seabird assessments separate in-combination totals have been provided following both the Applicant's and also Natural England's preferred approach (Appendix D)., including Natural England's bespoke approach for the guillemot and razorbill feature of the FFC SPA. The evidence supporting the Applicant's preferred approach to the assessment of the qualifying features of the FFC SPA is detailed within the following submissions:

Reference	BEIS request	Applicant's Response
		• G1.47 Auk Displacement and Mortality Evidence Review (REP1-069); • G2.9 Gannet Displacement and Mortality Evidence Review (REP2-045); • G4.7 Ornithological Assessment Sensitivity Report (REP6-026); • G5.7 Indirect Effects of Forage Fish and Ornithology (REP5-085); and • G7.4 Applicants Ornithology Position Paper (REP7-085). For the assessment of the potential impacts of displacement in-combination totals on seabirds, the Applicant has also included displacement matrices within Appendix D for each in-combination total when considering Hornsea Four with all current consented projects only as well as matrices for Hornsea Four with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2 within the updated in-combination assessments presented. The former were presented as agreed with Natural England, due to uncertainties regarding final values for Sheringham Shoal Extension, Dudgeon Extension and Rampion2. With respect to the most appropriate displacement and mortality rates for impact assessment conclusions, the Applicant would recommend using the proposed rates based on the evidence review and critical appraisal of displacement undertaken by the Applicant (REP1-069 and REP2-045). These reports extensively reviewed post consent monitoring data for auks from 21 OWFS based on 38 years of combined data from 28 reports and data for gannets from 25 OWFs based on 34 years of combined data from 30 reports. The Applicant would not recommend consideration of Natural England's range-based approach of 30-70% displacement and 1-10% mortality rates for auks or 60-80% displacement and 1-10% mortality rates for gannet due to Natural England defining these ranges without due consideration of the quality or reliability of the datasets, nor how species behaviour may change seasonally. The details of Natural England's approach to assessment of Hornsea Four are based on the following submissions:

Reference	BEIS request	Applicant's Response
		• Additional guidance on the assessment of guillemot and razorbill displacement impacts for the Hornsea Project Four Offshore Wind Farm (REP5-115); • Additional guidance on the apportioning of northern gannet and black-legged kittiwake to Flamborough and Filey Coast (FFC) Special Protection Area (SPA) for the Hornsea Project Four Offshore Wind Farm (REP5-116); and • Natural England's End of Examination Position on Offshore Ornithology (REP7-104). With respect to the guillemot and razorbill feature of the FFC SPA, Natural England proposed an entirely new and bespoke approach to assessment of Hornsea Four (the predicted impact level of which are presented within Appendix D). The Applicant wholly disagrees with the rationale provided by Natural England to justify such deviation from their standard defined seasons for assessment, notwithstanding that this approach goes against previous advice provided by Natural England to Hornsea Four (agreement OFF-ORN 6.12 & 6.13 as set out in the Evidence Plan Logs which are appendices to the Hornsea Four Evidence Plan (B.1.1.1: Evidence Plan (APP-130)). Furthermore, the rationale for Natural England considering that deviation from the standard seasonal assessment approach is required for Hornsea Four is flawed. Migratory pulses of auks during the post-breeding bio-season are commonly recorded across the Southern North Sea and from other OWFs baseline and post-consent monitoring surveys as presented in G5.7 Indirect Effects of Forage Fish and Ornithology (REP5-085), yet no such bespoke approach was advised previously for other projects. Further details on the Applicant's concerns with Natural England's bespoke approach are provided in: • G5.34 Applicant's response to Natural England's additional guidance on apportioning of seabirds to FFC SPA for Hornsea Project Four (REP5A-018);

Reference	BEIS request	Applicant's Response
		• G8.3 Applicant's Response to Deadline 6 Ornithology submissions (REP8-012); and • G8.8 Applicant's comments on Natural England's Deadline 7 Ornithology Submissions (REP8-017). Updated FFC SPA Population Viability Analysis Results The Applicant undertook updated Population Viability Analysis (PVA) modelling, submitted at deadline 6 of Hornsea Four Examination, the results of which are presented in G4.7 Ornithological Assessment Sensitivity Report (REP6-026). These updated PVA results were based on a wide range of generic impact values to account for any changes in impact values through Examination and the decision period. The range of impact values presented within the assessment sensitivity report (REP6-026) cover the full range of potential impacts based on the previous as well as updated in-combination tables in Appendix D, therefore in relation to the CFGR can still be relied upon to infer potential population changes when considering varying levels of predicted impacts apportioned to the FFC SPA. CFPS results for PVA modelling the Applicant undertook and presented within the assessment sensitivity report (REP6-026) are provided within Appendix E, due to not being presented within the assessment sensitivity report (REP6-026). The input parameters for all PVA results below are provided within the appendices of the assessment sensitivity report (REP6-026). The CFPS PVA results were previously not presented alongside the CFGR due to significant concerns over the reliability of using such results the justification for which is provided in the assessment sensitivity report (REP6-026).
19	In relation to in-combination impacts on the red-throated diver and common scoter features of the Greater Wash SPA, the Applicant is requested to provide in-combination assessments for disturbance and displacement effects, including the latest figures from the Sheringham Extension and Dudgeon Extension projects.	As detailed within the RIAA (APP-167) and further clarified within the assessment of common scoter and red-throated diver within the export cable corridor (ECC) note (REP2-049), connectivity between Hornsea Project Four and the common scoter and red-throated diver qualifying features of the Greater Wash SPA was concluded to occur only within the ECC. The assessment of potential displacement impacts due to the presence of cable laying vessels within the ECC during the construction phase was predicted to be at most, less than a single red-

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		throated diver and less than a single common scoter subject to mortality even when considering a displacement rate of 100% and Natural England's upper range of 10% mortality, which for the reasons detailed within the response note can be considered unrealistic and a highly precautionary approach (**REP2-049**). With respect to construction phase in-combination impacts from cable laying activities within the ECC on the red-throated diver and common scoter features of the Greater Wash SPA, due to the predicted impact being at most less than a single individual for either species even when considering Natural England's highly precautionary approach, it was concluded Hornsea Four would not provide a material contribution to any in-combination assessment, therefore an in-combination assessment for the Greater Wash SPA was not deemed appropriate to undertake (**REP2-049**). Furthermore, at the time of submission there were no other projects with confirmed ECC construction phase temporal overlap with Hornsea Four's proposed construction timeframes with potential connectivity to the Greater Wash SPA to make an in-combination assessment possible, regardless of Hornsea Four's contribution to an in-combination assessment being immaterial. Following the Applicant's submission of the Greater Wash SPA assessment clarification note (**REP2-049**), Natural England were satisfied that the qualifying features of the Greater Wash SPA have been appropriately assessed, which included the Applicant's justification for an in-combination assessment not being required, and concluded that no further assessment of the Greater Wash SPA was required meaning an AEoI with respect to the Greater Wash SPA qualifying features could be ruled out for any potential impacts from Hornsea Four (**REP8-031, point B76**). The Applicant has reassessed the potential for construction phase overlap based on the latest information submitted by Sheringham Shoal and Dudgeon Extension projects, the conclusions of which were there is potential for overlap to occur for cable laying activities within the ECC to occur, albeit a very low likelihood given their current programme timeline. A precautionary approach has been taken nevertheless and an in-combination impact is provided below for red-throated

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		diver only based on the impacts presented within Sheringham Shoal and Dudgeon Extension RIAA (Equinor, 2022[1]). As presented within Appendix D, even when considering a displacement rate of 100% and Natural England's upper range of 10% mortality the predicted impact level in-combination is less than a single red-throated diver (0.6) per annum. The citation population of red-throated diver is classified as 1,407 individuals with a background mortality rate of 225 individuals per annum (based on a survival rate of 0.84 (Horswill and Robinson, 2015[2]). The addition of less than a single (0.6) red-throated diver per annum would result in a 0.27% increase in the baseline mortality at most. It can therefore be concluded, there is no potential for an AEoI to the conservation objectives of the red-throated diver feature of Greater Wash SPA in relation to disturbance and displacement effects in the construction phase from Hornsea Four in-combination with other planned projects and therefore, subject to natural change, red-throated diver will be maintained as a feature in the long-term with respect to the potential for adverse effects from disturbance and displacement. No assessment of the common scoter feature of the Greater Wash SPA was undertaken by Sheringham Shoal and Dudgeon Extension, therefore a construction phase ECC in-combination assessment was not possible. No common scoter were recorded within the array area plus 4 km buffer and only a single red-throated diver was recorded flying within the array area plus 4 km buffer throughout the full 24 months of site-specific surveys, therefore it was concluded that no connectivity exists between the Hornsea Four array area and the Greater Wash SPA, and therefore no contribution from Hornsea Four to any operational phase in-combination displacement impacts due to the presence of WTGs.

[1] Equinor (2022). Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects Report to Inform Appropriate Assessment (RIAA).
[2] Horswill, C. & Robinson R. A. 2015. Review of seabird demographic rates and density dependence. JNCC Report No. 552. Joint Nature Conservation Committee, Peterborough.

Reference	BEIS request	Applicant's Response
		With respect to potential disturbance from maintenance vessels travelling to and from the Hornsea Four array area, as detailed within the RIAA (APP-167) maintenance vessels would follow the known vessel traffic routes out to the project. The shipping route out of the Humber estuary port does overlap with the Greater Wash SPA, however any disturbance caused by vessel traffic would be considered part of the baseline due to the vessel route being in place prior to designation of the SPA (formally designated in March 2018). The addition of maintenance vessels for Hornsea Four would not contribute any further disturbance to what is a commercially used shipping lane. It should also be noted that due to the SPA being designated in 2018 the majority of OWFs which have connectivity to the SPA such as Linc, Lynn, Inner Dowsing, Race Bank, Sheringham Shoal etc were all fully operational at the point of designation, therefore any disturbance impacts from these operational OWFs would be part of the baseline for the SPA.
20	In relation to the proposed compensation measures for the kittiwake feature of the Flamborough and Filey Coast SPA, the Applicant is requested to provide further details of the artificial nesting sites (ANS). This should include, but not be limited to: • Confirmation of the location(s) of the ANS, and evidence that the proposed sites can be acquired/leased. • Details of the ANS design/ adaptations to support kittiwakes and auks, if appropriate. • An implementation timetable for when the compensation measures will be delivered and when they will achieve their objectives in relation to the commencement of operation of the wind farm.	Please see below the Applicant's response to each of the points requested regarding further details of the artificial nesting sites (ANS) below: • Confirmation of the location(s) of the ANS, and evidence that the proposed sites can be acquired/leased. Offshore Repurposed ANS As set out in the examination submissions (such as B2.7.2 Compensation measures for FFC SPA: Kittiwake Offshore Artificial Nesting Roadmap (REP7-021)), the Applicant has signed a memorandum of understanding (MoU) with Alpha Petroleum Resources Limited and Energean UK Limited with a view to the potential repurposing of the Wenlock Platform, the location of which is presented in Figure 3 of B2.7.2 Compensation measures for FFC SPA: Kittiwake Offshore Artificial Nesting Roadmap (REP7-021). The MoU grants exclusivity to the Applicant until 31st December 2023 to allow the parties to negotiate a formal agreement. Following the close of Examination, the Applicant has continued to progress discussions with the owner and operator of the Wenlock platform and is working towards on option to enter into an Asset Transfer Agreement subject to the satisfaction of conditions

Reference	BEIS request	Applicant's Response
		precedent including the issue of a marine licence to adapt the platform and the platform being made hydrocarbon free. The parties are confident that an option agreement will be agreed during 2023 in line with Hornsea Four's current programme. The letter provided at Appendix F is signed by all parties to demonstrate the progress made to date. Offshore New ANS The site selection process for a new offshore ANS was presented in **B2.7.2 Compensation measures for FFC SPA: Kittiwake Offshore Artificial Nesting Roadmap (REP7-021)**. Following this process, at Deadline 7 a refined area of search for a new offshore nesting structure consisting of a 10 km x 10 km section of the heatmap was identified and is shown in Figure 3 of the Offshore Nesting Roadmap (**REP7-021**). Discussions with stakeholders had been undertaken on their preference of different sites within the refined area of search. Following the end of Examination, the Applicant has selected a specific site for the new offshore ANS based on stakeholder preference, for which geophysical and geotechnical investigations have been undertaken. This location is within the refined search area is shown in Appendix G. Section 11 of **B2.7.2 Compensation measures for FFC SPA: Kittiwake Offshore Artificial Nesting Roadmap (REP7-021)** sets out how the Applicant would secure key consents and seabed agreements for the offshore ANS. Following Examination, the Applicant has commenced work to secure a Marine Licence and has submitted an Environmental Impact Assessment (EIA) screening request (reference EIA/2022/00051) to the Marine Management Organisation (MMO) for their consideration on the 15th December 2022. With regards to securing an Area for Lease (AfL) for the site, as stated in Examination, the Applicant has been engaging regularly with The Crown Estate on the site selection for a new offshore ANS and is expecting to receive the draft AFL from The Crown Estate in early 2023.

Reference	BEIS request	Applicant's Response
		Onshore ANS The site selection process for an onshore ANS was presented in **B2.7.4 Compensation measures for FFC SPA: Kittiwake Onshore Artificial Nesting Roadmap (REP7-023)**. Updates on the site selection for onshore nesting structure were provided at Deadline 6 in **G6.3 Kittiwake Onshore Artificial Nesting Structure Site Selection and Evidence on Nesting Limitations Update (REP6-031)**. Following this process, an ecologically suitable site was identified and the Applicant has signed an exclusivity agreement with the owner. The location of this land parcel is within the southern section of the wider Whitby search area shown in Figure 4 of **G6.3: Kittiwake Onshore Artificial nesting Structure Site Selection and Evidence on Nesting Limitation update (REP6-031)**. Section 10 of **B2.7.4 Compensation measures for FFC SPA: Kittiwake Onshore Artificial Nesting Roadmap (REP7-023)** sets out how the Applicant would secure key consents for the onshore ANS. • Details of the ANS design/ adaptations to support kittiwakes and auks, if appropriate. ANS Design/ Adaptations The design considerations and principles for the topside for both a new or repurposed ANS with regards to kittiwake were presented in **B2.7.5: Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA): Artificial Nesting: Site Selection and Design (APP-191)**. In summary, offshore ANS suitable for kittiwake comprise vertical walls with horizontal nesting 'ledges', with a vertical drop to water below ledges. Ledges should be of sufficient protrusion from the back wall to support a nest, but sufficiently narrow to discourage predation by large gulls. Each kittiwake nest requires minimum 20 cm wide, 30 cm of length along a ledge, 40 cm of vertical space between the ledge and the ledge (or 'roof') above and 15 cm depth/protrusion of ledge. Details of the ecological evidence to support these design features is provided in (**B2.7.1 Compensation**

Reference	BEIS request	Applicant's Response
		measures for FFC SPA: Offshore Artificial Nesting: Ecological Evidence (APP-189)). Following the end of Examination, the Applicant has continued to progress the design process. The design of the ANS constitutes a modular, scalable solution comprising of modified DNV (offshore shipping) style containers, constructed to accommodate bespoke nesting panels and ancillary components. The utilisation of an industry standard container solution enables its deployment in multiple contexts as its presence throughout industry ensures ease of manufacturing, transportation, installation, lifting and maintenance across the onshore, nearshore, and offshore locations being considered. In the maritime context, it is planned that the container modules are arranged flush along the outer edges of the foundation to establish an artificial cliff face. This design using container modules placed at the edge of the structure would also be applied for the repurposing of the Wenlock Platform, mitigating against the need for significant technical intervention or challenging lifting solutions. The containerised ANS provides an optimal solution that fulfils ornithological requirements whilst offering a modular, scalable unit in an omnipresent form. ANS Design/ Adaptations for Auks Artificial nesting is not currently being proposed as a compensation measure for auks however the existing designs for kittiwake ANS would likely only require relatively minor modifications to accommodate breeding guillemot and razorbill if needed. This would likely involve the removal of some of the partition walls between nesting compartments to create a longer ledge and inclusion of a slightly wider shelf c. 25 cm depth (which fits within the proposed range of widths from 15 cm to 25 cm suggested for kittiwake). An existing artificial structure in the Baltic

Reference	BEIS request	Applicant's Response
		Sea (Stora Karlsö Auk Lab - Hentati-Sundberg et. al. 2011[3]) which has been designed specifically for breeding auks (and is occupied by breeding guillemot) includes shelves which are 25 cm deep. In addition, visual observations from existing offshore structures which support breeding guillemot (first photo below) and razorbill (second photo below) demonstrate the species has the capacity to breed on ledges of similar dimensions to nesting kittiwake (though the exact measurements are not currently available and have not been formally scientifically tested/reported).  **Guillemots with chick on an installation during the Hornsea Four July 2022 boat based survey of oil and gas platforms.**

[3] Hentati-Sundberg, J., Österblom, H., Kadin, M., Jansson, Å. & Olsson, O. (2011). The Karlsö murre lab methodology can stimulate innovative seabird research. Marine Ornithology 40: 11–16

Reference	BEIS request	Applicant's Response

Razorbill with egg on a platform in June 2022 - image courtesy of platform personnel.

The Applicant is aware that the Offshore Wind Industry Council's Derogation Subgroup (OWIC DS) are considering ANS for auks as part of strategic compensation and the Applicant is happy to continue discussions with the OWIC DS group. If the SoS requires this to be progressed, the Applicant could consider these dimensions best suited for auk species, discuss with the OOEG and incorporate them into the ANS designs.

- An implementation timetable for when the compensation measures will be delivered and when they will achieve their objectives in relation to the commencement of operation of the wind farm.

Timescales for Implementation and Delivery

The Applicant provided an indicative timescale for implementation and delivery of the compensation measure of artificial nesting in Table 1 of both **B2.7.2 Compensation measures for FFC SPA: Kittiwake Offshore Artificial Nesting Roadmap (REP7-021)** and **B2.7.4 Compensation**

Reference	BEIS request	Applicant's Response
		measures for FFC SPA: Kittiwake Onshore Artificial Nesting Roadmap (REP7-023). Section 3.2 of B2.7 FFC SPA: Kittiwake Compensation Plan (REP7-019) provides an overview of the timescales for the establishment of the results for this compensation measure. The Applicant has carefully considered the ecological evidence and technical delivery of compensation and held discussions with Natural England with regard to an appropriate lead in time for the compensatory measure. As noted in paragraphs 3.2.1.4 to 3.2.16 of the B2.7 Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Kittiwake Compensation Plan (REP-019), it is the Applicant's position that it is important to balance the need to deliver the compensation measure with the pressing and urgent need to deliver offshore wind energy. There is a strong case to be made to not include a specific timescale within the DCO but to ensure the ANS should be in place prior to operation; to enable faster deployment of offshore wind energy and is consistent with the change in policy as set out in the BESS (see paragraph 3.2.1.5). If the Secretary of State considers that a lead in time is required, the Applicant has committed to ensure the nesting structure is in place at least three full kittiwake breeding seasons prior to operation of any wind turbine. Three breeding seasons is supported by Coulson's (2011) observations of the recruitment age of English breeding kittiwake where a significant proportion (26.5%) of kittiwakes were aged three when they bred for the first time. The Applicant has been closely following the progress made and engagement undertaken by Hornsea Three and is ensuring this knowledge and lessons learned are carried over to the Hornsea Four project.
21	In relation to the compensation measures for the auk features of the Flamborough and Filey Coast SPA, the Applicant is requested to provide further details of the proposed measures. This should include, but not be limited to the following: • For the predator eradication strategy:	Please see below the Applicant's response to each of the points requested regarding further details of the proposed compensation measures for the auk features below:

Reference	BEIS request	Applicant's Response
	- Confirmation of the location(s) proposed for the predator eradication, and evidence that the necessary permissions to undertake the measures can be obtained at the location(s). - Evidence that nest predation is a significant limiting factor in the breeding success of auk species at the proposed location(s). - Evidence that the auk populations in the proposed location(s) are functionally linked to the populations at Flamborough and Filey Coast SPA. - If the proposed location(s) is outside of the jurisdiction of the UK, evidence that any made Order could adequately secure management of the site.	• Confirmation of the location(s) proposed for the predator eradication, and evidence that the necessary permissions to undertake the measures can be obtained at the location(s) The Applicant has provided comprehensive and well-evidenced compensation plans, identifying a suite of compensatory measures for each of the key species, should compensatory measures be required (noting the Applicant maintains there is no risk of an AEoI for guillemot and razorbill). The Applicant is able to confirm following the completion of the implementation study that the locations proposed for compensation on a 'without prejudice' basis have not changed since the Examination submissions, due to favourable outcomes of that study. The locations proposed for the predator eradication compensation measure remains as the: Bailiwick of Guernsey: o Herm: Including Herm, The Humps and Jethou; and o Alderney: A number of islands/ islets around the main island. As set out in the **B2.8 Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Guillemot and Razorbill Compensation Plan** (**REP7-027**) in **paragraph 3.3.3.2**, the Applicant states that "During Issue Specific Hearing 12, the Applicant confirmed that their preference would be to focus on the Herm Island complex (Herm, Jethou, including Grand Fauconnière and the Humps (islands and islets within the Ramsar site)), with locations in Alderney providing an adaptive management option." and the Applicant can confirm the refined site selection and chosen locations has not changed since Examination. Rat free nesting space for guillemot and razorbill is highly limited at these locations. Given the preference for these locations, the Applicant has not found it necessary to further progress matters at Sark in the Bailiwick of Guernsey at this stage, however the islands and islets at Sark remain a viable option if required, as detailed in **G1.33 Predator Eradication Island Suitability Assessment: Bailiwick of Guernsey** (**REP5-057**). As

Reference	BEIS request	Applicant's Response
		set out in Table 6 and paragraph 1.1.1.12 of the G1.33 Predator Eradication Island Suitability Assessment: Bailiwick of Guernsey (REP5-057) and confirmed in paragraph 1.3.1.4 in the B2.8 Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Guillemot and Razorbill Compensation Plan (REP7-027) by undertaking predator eradication there will be sufficient rat free nesting space available for guillemot and razorbill to compensate for potential impacts. The Applicant's ongoing studies in the Bailiwick of Guernsey in 2022 as detailed in Section 5.1 of the B2.8.4 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Predator Eradication Roadmap (REP-031) have provided confidence and have further corroborated the available nesting spaces and delivery of the compensation measure at the locations; the Herm island complex and islands and those islands and islets surrounding Alderney (with guillemot and razorbill populations and recent recorded presence of rats) as locations for adaptive management (as set out in Table 6 of the G1.33 Predator Eradication Island Suitability Assessment: Bailiwick of Guernsey (REP5-057)). The Applicant is confident the compensation is deliverable, scalable and can be secured for the quantum of compensation (if any) the Secretary of State considers is required (see G7.4 Applicants Ornithology Position Paper (REP7-085)). The Guillemot and Razorbill Compensation Plan (REP7-027) sets out the evidence that the necessary permissions to undertake the compensation measures can be obtained at the locations (see also Sections 7 and 8 and in particular paragraph 8.1.1.7 in B2.8.4 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Predator Eradication Roadmap (REP7-031)). The States of Guernsey and States of Alderney are Crown dependencies, but the land including the islets and islands is administered by the States. An MoU has been agreed by the States of

Reference	BEIS request	Applicant's Response
		Guernsey (dated 10th June 2022) and the Alderney Wildlife Trust[4] (dated 20th December 2022) providing a framework to ensure support and long term security of the compensation measure in addition to letters of comfort (**Appendix A and B** of **B2.8.4 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Predator Eradication Roadmap** (**REP7-031**)). All necessary permissions were granted for the implementation studies and the MOUs set the foundation for future permissions and the Applicant is confident the necessary permissions can be secured due to the agreed MOUs. All compensation measures are feasible and can be delivered while providing flexibility and scalability. • Evidence that nest predation is a significant limiting factor in the breeding success of auk species at the proposed location(s). The Applicant has provided a detailed review of evidence to support predator eradication to benefit guillemot and razorbill throughout their various submissions. The Applicant presented within their **B2.8.3 Volume B2, Annex 8.3: Compensation measures for FFC SPA: Predator Eradication: Ecological Evidence** (**APP-196**) report evidence which showed invasive mammalian predators have been a significant limiting factor to breeding success across multiple UK colonies. The report highlighted that where breeding locations for guillemot and razorbill are accessible to predators, such as rats, there is a likelihood that mammalian predation will be a limiting factor to breeding success including the Bailiwick of Guernsey. The **B2.8.3 Volume B2, Annex 8.3: Compensation measures for FFC SPA: Predator Eradication: Ecological Evidence** (**APP-196**) report showed that when mammalian predators were removed from many of the example colonies, guillemot and razorbill seabird populations

[4] It is understood that the Alderney Wildlife Trust provides a range of services normally within the purview of government; including responding to environmental aspects of planning issues in the absence of an Environment Department.

Reference	BEIS request	Applicant's Response
		responded positively. For example, Section 6.2 of the report demonstrated a threefold increase in guillemot following the successful eradication of rats from Lundy Island (Bristol Channel, UK) in 2004. Similar results were also reported for razorbill and other seabird species (such as Manx shearwater) with success being associated with the removal of rats by the eradication project. The Applicant used this evidence to inform a site selection process to identify other guillemot and razorbill colonies where nesting locations which host and are accessible to invasive mammalian predators. The Applicant presented the results of this process within their B2.8.3 Volume B2, Annex 8.3: Compensation measures for FFC SPA: Predator Eradication: Ecological Evidence (APP-196) report. The Applicant refined the site selection process to a shortlist of islands and islets within the Bailiwick of Guernsey and assessed the potential suitability of shortlisted sites within the G1.33 Predator eradication island suitability assessment: Bailiwick of Guernsey (REP5-057) report. Due to the majority of the habitat within the shortlisted sites (and indeed, generally across the region) across the Bailiwick of Guernsey being low lying and/ or accessible, most potential, current or historic nesting locations are susceptible to mammalian predators. Table 6 of G1.33 Predator eradication island suitability assessment: Bailiwick of Guernsey (REP5-057) shows that only one location within the Bailiwick of Guernsey is likely to offer habitat which is currently rat free. This coincides with the location being one of the few sites supporting guillemot in high numbers despite other areas of suitable habitat and the region supporting increasing guillemot populations. It is therefore highly likely that where rats are present at guillemot and razorbill colonies, they are impacting breeding success. Within the Applicant's recent submission, including REP5-082, they have evidenced (using camera traps and other methods such as bait blocks) a high degree of overlap between the potential guillemot and

Reference	BEIS request	Applicant's Response
		razorbill (some of which historically supported both species) and rat habitat. For example, **Figure 7** of **REP5-082** shows black rats in Alderney in exactly the same location as the boulders with guillemot prospecting nesting locations. The report (**REP5-082**) found no un-utilised guillemot habitat which was deemed to be not accessible to mammalian predators was identified by the Applicant across the shortlisted locations.  **Trail camera photos of a guillemot nesting area (photo taken in daylight) (left) occupied by a black rat (photo taken at night) (right) (Figure 7 in REP5-082).** During surveys in 2021, carcasses of adult auks were identified near a bait box which was the closest bait box to the guillemot nesting area, and the remains of a broken razorbill eggshell were found in a likely nest site with damage indicative of predation (see **Figure 6** in **G5.4 Predator Eradication Implementation Study Update** (**REP5-082**)). All locations included within **G5.4 Predator Eradication Implementation Study Update** (**REP5-082**) are demonstrated as being suitable and feasible for predator eradication to support guillemot and razorbill. During ISH 12, the Applicant stated their preference would be to focus on the Herm Island complex, with locations in Alderney providing an adaptive management option.

Reference	BEIS request	Applicant's Response
		The impact of mammalian predation on seabirds in the Bailiwick of Guernsey is recognised by the States of Guernsey "The only work carried out to date has been a research study which identified that the Ramsar site was important for seabird populations and that a rat eradication programme would be beneficial to those populations" (see the letter of support **Appendix B** in **B2.8.4 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Predator Eradication Roadmap** (**REP7-031**)). The impact of mammalian predation on seabirds has been recognised by Alderney Wildlife Trust since their early reporting on the Ramsar site (see **Section 3.2** and **3.4** including footnotes to the Ramsar Site Annual Review in the **G1.33 Predator eradication island suitability assessment: Bailiwick of Guernsey** (**REP5-057**)). Based on the above summary of information provided by the Applicant to date, the Applicant, and technical experts supporting the potential compensation measure are confident the predator eradication and or control at the identified locations will provide rat free nesting opportunities for guillemot, razorbill and other seabird species, and in turn increase breeding success. • Evidence that the auk populations in the proposed location(s) are functionally linked to the populations at Flamborough and Filey Coast SPA. The legal framework for HRA and relevant guidance, do not require the guillemot and razorbill compensation measures to directly benefit the FFC SPA. Instead, they require any necessary compensatory measures are secured to ensure the overall coherence of the UK National Site Network is protected. The aim of compensation is to ensure the coherence of the UK National Site Network for the impacted feature. In order to achieve this, the Applicant has proposed compensation measures within the relevant species biogeographic population range (i.e., the north east Atlantic breeding population of guillemot which

Reference	BEIS request	Applicant's Response
		includes the Uria *aalge albionis* and Uria *aalge aalge* subspecies) from which recruits to the Flamborough and Filey Coast SPA population are drawn. Further information to support this was provided by the Applicant in **G3.4.1: Compensation measures for FFC SPA: Ecological Connectivity of Compensation Measures Annex 1** (**REP3-034**). • If the proposed location(s) is outside of the jurisdiction of the UK, evidence that any made Order could adequately secure management of the site. As provided within the Applicant's Comments to RSPB **(REP5-119) (REP5-120),** and the Applicant's response to 6.42-6.50 in **G3.3 Applicant's comments on other submissions received at Deadline 2 (REP3-031**); it is important to note that the Applicant is not seeking to obtain planning consent or land rights to deliver the compensatory measures via the DCO. The question of "jurisdiction" is not therefore relevant. Draft DCO provisions to secure compensatory measures for guillemot and razorbill have been provided by the Applicant. These can be included in the Order made by the Secretary of State if he cannot rule out AEoI for those species. These provisions contain a restriction on the operation of the wind turbine generators (which are the subject of the DCO application and within the remit of the Secretary of State) until the predator eradication measure has been carried out. The fact that the predator eradication measure may be carried out in a location outside of the UK (but with connectivity to the UK National Site Network) has no bearing on the ability of the Secretary of State to enforce this provision against the Applicant. It is not necessary for the Secretary of State (or the MMO) to also be responsible for permitting or property rights over the area in which the compensation measures are located. A parallel can be drawn with ANS for kittiwake (accepted on five DCOs to date). The Secretary of State is

Reference	BEIS request	Applicant's Response
		not responsible for permitting the structures (this will be the local planning authority onshore or the MMO offshore). Property rights are granted by private landowners or The Crown Estate. Responsibility for permitting or granting land rights has no bearing on the ability of the Secretary of State to secure the compensatory measures, and if it were ever necessary, to enforce the provisions of the DCO against the relevant undertaker. Notwithstanding the ability to enforce the DCO, the Applicant has provided sufficient evidence that the Secretary of State can be confident at the point of awarding the DCO that the compensation measures can be secured. Please see the Applicants above response to question 21 regarding the evidence demonstrating the Applicant can secure the necessary permissions if compensation measures are required.
	• For the by-catch reduction strategy: - Evidence that the use of looming eye buoys (LEBs) would significantly reduce the by-catch of auks from the Flamborough and Filey Coast SPA. – Details of how the proposed measures will be secured for the lifetime of the project. – Evidence that the proposed measures will be in addition to any by-catch reduction measured required by UK policy or legislation.	Regarding the bycatch reduction compensation measure: • Evidence that the use of looming eye buoys (LEBs) would significantly reduce the by-catch of auks from the Flamborough and Filey Coast SPA The evidence presented within **B2.8 FFC SPA: Guillemot and Razorbill Compensation Plan** (**REP7-028**) and supporting annexes (including **B2.8.2 Compensation measures for FFC SPA: Guillemot and Razorbill Bycatch Reduction: Roadmap** (**REP7-029**)) demonstrates that the proposed measures are capable of compensating for the potential impact on the qualifying guillemot and razorbill features of the FFC SPA as part of a compensation package (as determined by the Secretary of State). Further information on the success of the LEB is provided in **G5.13 Bycatch Reduction Technology Selection Phase Summary** (**REP5-068**). Whilst bycatch reduction cannot be undertaken within the FFC SPA, the birds that the compensation measure will prevent the mortality of will assimilate into the biogeographic population of guillemot and the biogeographic population of razorbill thereby ensuring the coherence

Reference	BEIS request	Applicant's Response
		of the UK National Site Network is maintained. Further information to support this is provided in **G3.4.1: Compensation measures for FFC SPA: Ecological Connectivity of Compensation Measures Annex 1** (**REP3-034**). The bycatch reduction measure is proposed to be deployed within the English Channel during winter (see **Figure 1** of **B2.8 FFC SPA: Guillemot and Razorbill Compensation Plan** (**REP7-028**)). Ringing data shows connectivity between the English Channel and the wider UK National Site Network, thereby the bycatch reduction measure will provide benefits that will feed back into the UK National Site Network population as well as the relevant biogeographic populations of guillemot and razorbill from FFC SPA (see paragraph 4.2.1.4 of **G3.4.1 Compensation measures for FFC SPA: Ecological Connectivity of Compensation Measures Annex 1** (**REP3-034**)). This is discussed further in **Section 4.2 Wintering Connectivity** of **G3.4.1 Compensation measures for FFC SPA: Ecological Connectivity of Compensation Measures Annex 1** (**REP3-034**). • Evidence that the use of looming eye buoys (LEBs) would significantly reduce the by-catch of auks from the Flamborough and Filey Coast SPA. The Applicant is confident the bycatch reduction compensation if required can be secured for the lifetime of the project. As detailed in **G5.13 Bycatch Reduction Technology Selection Phase Summary** (**REP5-068**) during 2021/2022 the Applicant recruited ten vessels to participate in the bycatch reduction technology selection phase. The Applicant has expanded the number of vessels using Looming Eye Buoys (LEBs) during the non-breeding season 2022/2023 (as confirmed in the **G5.13 Bycatch Reduction Technology Selection Phase Summary** (**REP5-068**)) and recruited over 30 vessels to use the LEBs with participant contracts signed by all fishers and purchased further LEBs and monitoring systems. Fishers are requested to fish following their normal practice including with regards to location, but to deploy LEBs on each hauling trip and a monitoring system installed so there is

Reference	BEIS request	Applicant's Response
		no onerous requirements for fishers. The large number of fishers contracted in the 2022/2023 use of the LEB (over three times the amount required to compensate for the impact to guillemot and razorbill, if required (Table 2 in B2.6 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Overview (REP7-017)) and the largest implementation of its kind) demonstrates the willingness of fishers to participate. The fishers co-operation would be secured through private contractual arrangements whereby an annual monetary sum (index linked) is paid to individual fishers to secure the measure for the lifetime of the project. It is anticipated that the terms would be substantially the same as in the contracts for the first two years study. Section 6.3 of the Roadmap (B2.8.2 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Guillemot and Razorbill Bycatch Reduction Roadmap (REP7-029)) sets out the approach to adaptive management, if required. The compensation measures are part of a suite of compensation measures which provides the benefits of flexibility, scalability and resilience to respond to feedback or requirements identified by the adaptive management process or contribute to the Marine Recovery Fund (or equivalent fund) to enable successful delivery of the compensation (Section 4 of B2.8 Flamborough and Filey Coast (FFC) Special Protection Area (SPA) Guillemot and Razorbill Compensation Plan (REP7-027) and G8.8 Applicant's comments on Natural England's Deadline 7 Ornithology Submissions (REP8-017)). Following DCO consent and if compensation is deemed necessary by the Secretary of State, a long-term supply contract will be entered into to supply the technology and ensure its ongoing maintenance. In addition, the Applicant will enter into long term individual agreements with fishers to pay an annual sum for utilising the technology on their boats and monitoring bycatch (see Section7 of B2.8.2 Compensation measures for Flamborough and Filey Coast (FFC) Special Protection

Reference	BEIS request	Applicant's Response
		Area (SPA) Guillemot and Razorbill Bycatch Reduction Roadmap (REP7-029)). • Evidence that the proposed measures will be in addition to any by-catch reduction measured required by UK policy or legislation. The Applicant confirms that the proposed bycatch reduction measure is in addition to any bycatch reduction measures required by UK policy or legislation. The Marine Wildlife Bycatch Mitigation Initiative policy paper was published in August 2022 (Defra, 2022[5]) and provides information on existing UK government legislation and policy as well as objectives and ambitions to reduce bycatch of seabirds. The paper also lists various related initiatives, workstreams and steering groups which are working to identify the extent of bycatch, trial and implement measures to mitigate and minimise the bycatch of seabirds. Though there are workstreams ran by Statutory Nature Conservation Bodies (SNCBs) or Non-Governmental Organisations (NGOs) to conduct research and identify areas for implementation of mitigation measures, no policies or legislation has been identified that enforce the reduction of seabird bycatch in a manner which overlaps with the Applicant's proposals, or which propose to do so. The Applicant's compensation measure is therefore additional to the normal practices required for the protection and management of guillemot and razorbill in the UK. The Applicant is aware of the following general policy and legislation which include ambitions to reduce seabird bycatch, however so far as the Applicant is aware no set requirements or enforcement measures have been identified to reduce bycatch which overlap with the bycatch reduction measure proposed by the Applicant:

[5] Defra (2022). Marine wildlife bycatch mitigation initiative. Policy Paper August 2022. Available at: https://www.gov.uk/government/publications/marine-wildlife-bycatch-mitigation-initiative/marine-wildlife-bycatch-mitigation-initiative [Accessed December 2022].

Reference	BEIS request	Applicant's Response
		• The Fisheries Act 2020 and Joint Fisheries Statement (UK Public General Acts, 2020[6]); • The Marine Strategy Regulations 2010 (UK Statutory Instruments, 2010[7]); • 25 Year Environment Plan (England only) (Defra, 2018)[8]; • Scotland's Fisheries Management Strategy 2020 - 2030 (Scotland only) (Scottish Government, 2020[9]); • EU Regulation 2019/1241 (European Parliament and Council, 2019[10]); • The Conservation of Habitats and Species Regulations 2017 (UK Statutory Instruments, 2017a[11]) and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (UK Statutory Instruments, 2017b[12]); • Multilateral environmental agreements e.g., the OSPAR Convention (OSPAR, 1992[13]), the Convention on the Conservation of Migratory Species of Wild Animals (CMS, 2020[14]) and the International Convention for the Regulation of Whaling (IWC, 2022[15]); • The 1995 FAO Code of Conduct for Responsible Fisheries (FAO, 1995[16]); and

[6] UK Public General Acts (2020). Chapter 22. Available at: https://www.legislation.gov.uk/ukpga/2020/22/contents/enacted [Accessed December 2022].
[7] UK Statutory Instruments (2010). Number 1627. Available at: https://www.legislation.gov.uk/uksi/2010/1627/contents/made [Accessed December 2022].
[8] Defra (2018). 25 Year Environment Plan. Policy Paper. Available at: https://www.gov.uk/government/publications/25-year-environment-plan [Accessed December 2022].
[9] Scottish Government (2020). Future fisheries: management strategy - 2020 to 2030, ISBN 9781800041950. Available at: https://www.gov.scot/publications/scotlands-future-fisheries-management-strategy-2020-2030/ [Accessed December 2022].
[10] European Parliament and Council (2019). Regulations originating from the EU, 2019 No. 1241. Available at: https://www.legislation.gov.uk/eur/2019/1241 [Accessed December 2022].
[11] UK Statutory Instruments (2017)a. The Conservation of Habitats and Species Regulations 2017, No. 1012. Available at: https://www.legislation.gov.uk/uksi/2017/1012/contents/made [Accessed December 2022].
[12] UK Statutory Instruments (2017)b. The Conservation of Offshore Marine Habitats and Species Regulations 2017, No. 1013. Available at: https://www.legislation.gov.uk/uksi/2017/1013/contents/made [Accessed December 2022].
[13] OSPAR (1992). The OSPAR Convention. Available at: https://www.ospar.org/ [Accessed December 2022].
[14] CMS (2020). The Convention on the Conservation of Migratory Species of Wild Animals. Available at: https://www.cms.int/ [Accessed December 2022].
[15] IWC (2022). The International Convention for the Regulation of Whaling. Available at: https://iwc.int/home [Accessed December 2022].
[16] FAO (1995). Code of Conduct for Responsible Fisheries. Available at: https://www.fao.org/3/v9878e/v9878e00.htm [Accessed December 2022].

Reference	BEIS request	Applicant's Response
		• Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA, 1999[17]). The Applicant acknowledges that the EU Regulation 2019/1241 (European Parliament and Council, 2019) references "General restrictions on the use of static nets and driftnets" (Article 9), "Catches of marine mammals, seabirds and marine reptiles" (Article 11) and "Mitigation measures to reduce incidental catches of sensitive species" (Annex 8 Part B). The Applicant confirms that the bycatch reduction proposal is in addition to any of the requirements cited. Specific bycatch reduction technologies mentioned within EU Regulation 2019/1241 refer to the use of line weighting and bird-scaring lines used in longlining, with no mention of specific gillnet bycatch mitigation options. Additionally, the Applicant acknowledges the following initiatives and research led by SNCBs and NGOs: • Clean Catch UK (Defra); • UK marine bird bycatch Plan of Action (JNCC/Defra); and • Various research workstreams led by the RSPB (e.g. the Cornwall Bycatch Project (IFCA, 2021[18]) and the demersal longline bycatch reduction project (UK Seafood Innovation Fund, 2022[19])). Therefore, although SNCBs and NGOs are funding projects to understand seabird bycatch within UK waters, there are currently no policy or legislation requirements in parallel to these initiatives which overlap with the Applicant's proposals, or which propose such requirements. As noted above, the bycatch reduction compensation measure proposed by the Applicant is in addition to UK legislation and

[17] AEWA (1999). Agreement on the Conservation of African-Eurasian Migratory Waterbirds. Article IV(3). Available at: https://www.unep-aewa.org/ [Accessed December 2022].
[18] IFCA (2021). Cornwall Seabird Bycatch Mitigation Project. Available at: https://www.cornwall-ifca.gov.uk/looming-eyes [Accessed December 2022].
[19] UK Seafood Innovation Fund (2022). Developing a floated demersal longline design that minimises seabird bycatch (FS031). Available at: https://www.seafoodinnovation.fund/projects/developing-a-floated-demersal-longline-design-that-minimises-seabird-bycatch-fs031/ [Accessed December 2022].

Reference	BEIS request	Applicant's Response
		policy requirements specifically with regards to the protection of guillemot and razorbill in the UK.

Appendix A

APPENDIX 7: APPLICANTS' RESPONSE TO ACTION 4 (OPTIONS FOR THE SOS FOR BEIS ON HORNSEA 4 DCO APPLICATION)

Applicant's Response

At Issue Specific Hearing 1, preliminary discussion was held regarding the Proposed Development's interaction with Hornsea Project Four Offshore Wind Farm ("**Hornsea Project 4**"). The Examining Authority was particularly interested in the overlapping area of seabed within which both Hornsea Project 4 and the proposed offshore carbon and storage facility which is being consented separately from the Proposed Development ("**Endurance Store**") are proposed (the "**Overlap Zone**").

The Applicant explained that the Hornsea Project 4 DCO (Planning Inspectorate reference EN010098) is currently in examination (having commenced on 22 February 2022) and that that examination is considering in detail the competing legal and competing technical arguments as to whether co-existence of the Endurance Store and Hornsea Project 4 is possible within the Overlap Zone. That examination is also considering the nature of the provisions which should be included in the Hornsea Project 4 DCO in order to address issues in relation to the overlap.

The Applicant further explained that re-litigating these issues during the examination for this Application would not be sensible, as the Recommendation to be made by the relevant Examining Authority in the Hornsea Project 4 DCO will ultimately be provided to the same decision maker (the Secretary of State for Business Energy and Industrial Strategy, '**SoS**') prior to that decision maker receiving a Recommendation in respect of this Application.

The Applicant explained that the Proposed Development does not extend to the Overlap Zone. It has, therefore, no direct physical conflict with the Hornsea 4 Project. In contrast, the Hornsea Project 4 DCO application does seek authorisation of development in the Overlap Zone. There is therefore a direct relationship between the authorisation being sought in the Hornsea Project 4 DCO and the effect on the storage of CO2 in a significant part of the Endurance Store, which does not arise in respect of this Application[1].

Nevertheless, the Applicants are to seek the inclusion of an Article in the NZT DCO, to address liabilities which could in certain circumstances otherwise arise under the 'Interface Agreement'[2]. The additional Article and explanation for its inclusion are set out at Appendix 1 to this document – the Article will be included in the Applicant's draft DCO to be submitted at Deadline 2.

In this context, the Applicant offered at ISH1 to clarify for the Examining Authority what options are available to the SoS when determining the Hornsea Project 4 DCO and how such decisions may impact on the acceptability and deliverability of the Proposed Development. The Applicant considers such options to be, principally:

- **Scenario 1 - Refuse the Hornsea Project 4 DCO**. In this case the bp protective provisions would not exist. As explained in Appendix 1 to this document, this is the primary reason for the proposed inclusion of the additional Article in the NZT DCO. Without this Article, in circumstances where the Hornsea Project 4 DCO is refused,

1 The elements of the offshore storage works and their relevant consenting processes are explained at paragraph 4.8 of the Chapter 4 to the Environmental Statement [APP-086], Other Consents and Licences [APP-077], and as supplemented by information in the Written Summary of Oral Submission for ISH1 [Document Ref. 9.2].

2 An agreement between bp, Orsted and the Crown Estate which purports to regulate the development of the Hornsea 4 Project and the Endurance Store in the Overlap Zone. See the Explanatory Memorandum for more details.

the Interface Agreement would remain extant and so continue to present a very real risk to the viability of the Endurance Store to deliver the ECC plan. It is accepted there may be other primary reasons why the SoS may elect to refuse the Hornsea Project 4 DCO, distinct from its interface issues with the Endurance Store; however, it may be that the SoS is nevertheless still satisfied with the arguments proposed by bp in relation to the need to disapply the Interface Agreement and so the proposed Article of the NZT DCO enables the SoS to ensure its disapplication through the NZT DCO.

In this Scenario 1, where the NZT DCO is consented with the additional Article included, the Applicant does not consider there to be any impediment to the deliverability of the Proposed Development or for the refusal of Hornsea Project 4 to have any relevance to the Proposed Development's acceptability. Similarly, in the counter-factual scenario where the NZT DCO is consented without the additional Article included, whilst this would then present the abovementioned risk/viability challenges to the ability of the Endurance Store to deliver the ECC plan, the Proposed Development would nevertheless still remain viable and acceptable, even if it were limited to capturing and transporting the carbon to only the residual part of the Endurance Store outside of the Overlap Zone which is not subject to the terms of the Interface Agreement.

- **Scenario 2 – Hornsea Project 4 is consented, with bp's full protective provisions included (including the disapplication of the Interface Agreement)**. In such circumstances, the SoS would have accepted the submissions put forward by bp and particularly the need to safeguard the deliverability of the Endurance Store through inclusion of the bp protective provisions. It follows that he would have been satisfied with the need to disapply the Interface Agreement and so it would be similarly appropriate to include the additional Article in the NZT DCO (where consented) to ensure bp, as operator of carbon storage licence CS001, retained a degree of control and certainty, which may otherwise be absent were the provision to be limited to the Hornsea Project 4 DCO. As explained at Appendix 1, otherwise in such circumstances, Orsted could potentially not implement the DCO before it lapses, with the result that the Interface Agreement survives and this threatens the viability of the Endurance Store to deliver the ECC plan.

  Again, in this scenario, assuming the NZT DCO is consented with the additional Article included, the Applicant does not consider there to be any impediment to the deliverability of the Proposed Development, or for the granting of the Hornsea Project 4 DCO to have any relevance to the Proposed Development's acceptability.

- **Scenario 3 – Hornsea Project 4 is consented, with bp's protective provisions included, save for the disapplication of the Interface Agreement.** In such circumstances, the SoS would have accepted the need to prevent co-location between Hornsea Project 4 and the Endurance Store within the Overlap Zone but not agreed with bp's submissions as to why it is appropriate to disapply the Interface Agreement. In this circumstance, it would follow that the SoS would likely not be persuaded by the need to include the corresponding additional Article in the NZT DCO.

  The Applicant does not consider there to be any other relevance to the acceptability of the NZT DCO. Further, whilst bp considers that the failure to include a provision disapplying the Interface Agreement would have adverse consequences for the

viability of the Endurance Store to deliver the ECC plan, the Applicant does not consider that this would impact on the deliverability of the NZT DCO (for the reasons advocated in relation to Scenario 4 below).

- **Scenario 4 – Hornsea Project 4 is consented, with Orsted's alternative protective provisions included**. bp has made extensive submissions into the Hornsea Project 4 DCO examination as to why Orsted's protective provisions are insufficient to adequately safeguard the Endurance Store, and the very real risk presented to the viability of the Endurance Store to deliver the ECC plan if the Hornsea 4 DCO is granted with Orsted's version of the protective provisions. In all likelihood, this scenario would prevent the delivery of the ECC plan.

  Further, by reducing the available storage capacity by approximately 70% due to the location of the wind turbine infrastructure, it would significantly compromise the long-term use of the Endurance aquifer for carbon capture and storage.

  However, the Proposed Development would nevertheless remain viable in this scenario. The Proposed Development's carbon would be captured and transported to the residual part of the Endurance Store. As such, the Applicant considers the Proposed Development remains acceptable and deliverable in this scenario, notwithstanding the wider detrimental effects to the Endurance Store.

As can be seen from the above, whilst there are a number of different options available to the SoS when determining the Hornsea Project 4 DCO, the Applicant considers the acceptability and deliverability of the Proposed Development to be constant throughout each (particularly in Scenarios 1 and 2, where it would be expected that the additional Article would be included in the NZT DCO where granted). The Applicant would be happy to further clarify any of the above as is necessary to give the ExA confidence in agreeing to allow the scrutiny of this matter to be limited to the Hornsea Project 4 examination.

Appendix B

Net Zero Teesside Project

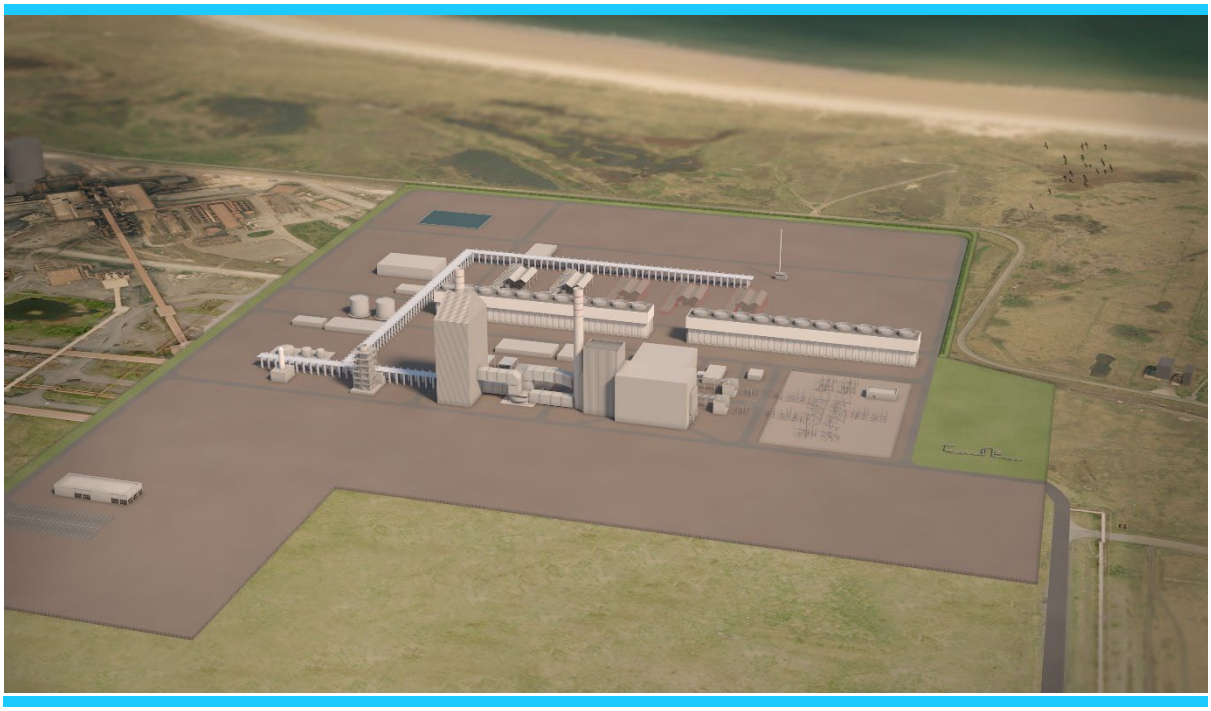
Planning Inspectorate Reference: EN010103

Land at and in the vicinity of the former Redcar Steel Works site, Redcar and in Stockton-on-Tees, Teesside

The Net Zero Teesside Order

Document Reference: 9.20 Applicants' response to Orsted Hornsea Project Four Ltd's Deadline 3 Submission

Planning Act 2008



Applicants: Net Zero Teesside Power Limited (NZT Power Ltd) & Net Zero North Sea Storage Limited (NZNS Storage Ltd)

Date: July 2022

CONTENTS

APPENDICES

1.0 COMBINED RESPONSE TO MATTERS RAISED BY HORNSEA PROJECT FOUR SUBMISSION IN NZT DCO

1.1.1 The Applicants have prepared this submission in response to Orsted Hornsea Project Four Limited's ("Orsted") submission at Deadline 3.

1.1.2 In particular, the Applicants have included in this response;

- An assessment of the impacts of the offshore elements of the NEP Project on Hornsea Project Four (as promised in Appendix 6 to their Written Summary of Oral Submission for Issue Specific Hearing 1 (REP1-035)). This is included as Appendix 1 to this response; and
- As Appendix 2 to this response, the submissions made by BP Exploration Operating Company Limited ("bp") (on behalf of NEP) into the Hornsea Project Four DCO examination (reference: EN010098) at Deadline 5a (4th July 2022), which also address (in the context of the NZT DCO's examination):
  - The response to the legal submissions made by Orsted at Deadline 2 (REP2-092) and the additional comments made by Orsted on the draft DCO at Deadline 3 (REP3-022), specifically section 2 of their document. bp's response is set out in Annex 2 to Appendix 2 of this response; and
  - The response to Orsted's submission on bp's technical evidence, which was appended to Orsted's Deadline 3 submission (section 3 and as separate annex – REP3-022, electronic page 12). bp's response is set out in Annex 1 to Appendix 2 of this response.

1.1.3 Annex 2 to Appendix 2 of this response identifies that bp is proposing to take a revised approach to the protective provisions submitted into the Hornsea Project Four DCO examination, which has relevance to Article 49 of the draft DCO for the Proposed Development (as that Article mirrors drafting from those protective provisions).

1.1.4 Specifically, and as described in Section 1.6 of that Annex 2, the revised approach no longer proposes to disapply the Interface Agreement (as currently drafted for in Article 49), but instead proposes to remove bp's liability to Orsted pursuant to it and instead of such liability, provides for bp (on behalf of NEP) to make a compensation payment to Orsted. bp is considering appropriate drafting to reflect that approach within its protective provisions to be included in the Hornsea Project Four DCO. The provision for the payment of such compensation will need to take account of the various considerations that would be relevant in determining quantum, and bp intends to submit such drafting at the next deadline in the Hornsea Project Four examination at the end of this month (following initial discussion at their forthcoming hearings). Following

which, the Applicants will update Article 49 to reflect the same at Deadline 5 of this DCO examination.

1.1.5 Finally, as a result of this revised approach, it is considered that the terms of s135(2) of the Planning Act 2008 are not engaged as The Crown Estate's ("TCE") rights under the Interface Agreement (as described in their submission into the Hornsea Project Four DCO examination (REP5-123), and which we understand will be repeated into this DCO examination at Deadline 4), will be unaffected.

APPENDIX 1 - ASSESSMENT OF THE IMPACT OF THE OFFSHORE ELEMENTS OF THE NEP PROJECT ON HORNSEA PROJECT FOUR

Net Zero Teesside

Assessment of the Impact of the offshore elements of the NEP Project on Hornsea Project Four

Introduction

Endurance Store

The Endurance Store is located in the Southern North Sea approximately 60 km east of Flamborough Head. Carbon Sentinel Limited (previously known as National Grid Twenty Nine Limited) was awarded the UK's first carbon storage licence (CS001) for the Endurance Store on 2nd November 2012 (the "Storage Licence"). The Crown Estate granted the corresponding Agreement for Lease ("AfL") over the Endurance Store on 14th February 2013 (the "Endurance AfL"). The current licensees to the Storage Licence are BP Exploration Operating Company Limited ("bp"), Carbon Sentinel Limited and Equinor New Energy Limited with bp also the named party to the Endurance AfL.

bp is the appointed operator of the Northern Endurance Partnership ("NEP"), which includes bp, Equinor, National Grid, Shell and TotalEnergies. The NEP (through Net Zero North Sea Storage Limited) proposes to construct and operate a CO2 transportation and storage system that will enable CO2 from certain carbon capture projects on Teesside and the Humber to be transported to the Endurance Store (the "NEP Project"). The participants in the NEP intend to subscribe for equity in the Applicant, Net Zero North Sea Storage Limited, for the development (and operation) of the NEP Project.

The NZT DCO seeks consent for the onshore elements of the NEP Project in Teesside down to the mean low water spring ("MLWS") mark (with the exception of those parts of the surface water outfall below MLWS which are to be consented via a Deemed Marine Licence). Applications for consent for the offshore elements of the NEP Project (in particular in relation to the Endurance Store itself) will be made from September 2022.

The carbon capture projects across Teesside and the Humber, enabled by the NEP Project, are together known as the "East Coast Cluster" (or "ECC"), which was selected in October 2021 as one of the UK's first two carbon capture, usage and storage ("CCUS") clusters following a successful bid to the Department for Business, Energy and Industrial Strategy ("BEIS"). The ECC plan aims to deliver 20 million tonnes per annum ("MTPA") of CCUS capacity by 2030, with further expansion to 27MTPA of CCUS capacity by 2035. The ECC plan is only viable if the NEP Project is permitted to develop to its full extent in accordance with the bid submission to BEIS, which was premised on the Endurance Store achieving its full capacity.

Hornsea Project Four Offshore Wind Farm

Orsted Hornsea Project Four Limited ("Orsted") is proposing to develop an offshore wind farm ("Hornsea Project Four") of up to 180 wind turbine generators, together with associated offshore and onshore infrastructure, approximately 69 km off the Yorkshire coast. A DCO application was made in late 2021 and examination began on 22 February 2022 (reference: EN010098).

Interface between the Endurance Store and Hornsea Project Four

The area of seabed subject to the agreement for lease granted by The Crown Estate ("TCE") in relation to Hornsea Project Four partly overlaps with the area of seabed subject to the Endurance AfL (the "Overlap Zone"). It was originally anticipated that it could be possible for Hornsea Project Four and the NEP Project to co-exist in the Overlap Zone and, on that basis, an agreement was put in place in February 2013 between TCE and the predecessor entities to bp and Orsted for the carbon storage and wind projects (the "Interface Agreement"). The Interface Agreement was designed to facilitate co-existence in the Overlap Zone by regulating and co-ordinating the relevant parties' activities in an attempt to manage potential conflicts.

However, after extensive analysis, bp and its NEP partners have concluded that co-existence across the entirety of the Overlap Zone is not feasible (for the reasons detailed in the summary of bp's position and the bp technical report, as part of bp's Deadline 1 submission into the Hornsea Project Four DCO examination, REP1-057, electronic page 115 onwards). In the event that the Hornsea Project Four DCO is granted in a form allowing wind infrastructure to be located across the entirety of the Overlap Zone, the Endurance Store could only be developed outside of the Overlap Zone, meaning the Endurance Store would only achieve 30% of its potential capacity so rendering the ECC plan unviable.

Protective provisions in Hornsea Project Four Examination

In consequence of the conclusion that co-existence will not be possible, bp has advocated (within the Hornsea Project Four examination) for the need for an Exclusion Area within the Overlap Zone, within which Hornsea Project Four cannot be constructed. Such provision is included within bp's protective provisions put forward into the Hornsea Project Four examination (Version 3, REP4-059, Appendix 1, electronic page 10).

bp has further explained, however, that the inclusion of the Exclusion Area by itself is insufficient to safeguard the deliverability of the full extent of the Endurance Store and so preserve the viability of the ECC plan. In its Deadline 5 submission on Hornsea Project Four (REP5-091, paragraphs 3.12 to 3.21, electronic page 3), bp explained how the existence of the Interface Agreement could give rise to a significant potential compensation liability – the potential for which would, in all likelihood, mean that the NEP would not elect to utilise the part of the Endurance Store within the Exclusion Area. This would in turn then prevent the full development of the Endurance Store,

delivery of the ECC plan and realisation of the important public benefits of ensuring delivery of the same.

As such, to remove this risk, bp previously proposed to disapply the Interface Agreement within its protective provisions.

However, in response to submissions on this point from Orsted (REP5-076) and TCE (REP5-123) (both into the Hornsea Project Four DCO examination), bp has now proposed a revised approach (included within its Deadline 5a submission into the Hornsea Project Four examination (REP5a-025). The revised approach no longer proposes to disapply the IA, but instead removes bp's liability to Orsted pursuant to it and, in lieu of such liability, provides for bp (on behalf of NEP) to make a compensation payment to Orsted. bp is considering appropriate drafting to reflect that approach within its protective provisions to be included in the Hornsea Project Four DCO. The provision for the payment of such compensation will need to take account of the various considerations that would be relevant in determining quantum, and bp intends to submit such drafting at the next deadline in the Hornsea Project Four examination at the end of this month (following initial discussion at their forthcoming hearings).

This alternative approach now proposed by bp achieves the same basic objective so as to protect the public interest, by addressing the risk that significant potential compensation liability to Orsted under the IA would prevent the delivery of the ECC Plan, and instead providing for a proportionate payment of compensation to be paid to them.

The inclusion of both the Exclusion Area and provision addressing the risk of a significant compensation claim from being triggered under the IA would collectively preserve both the deliverability and viability of the full extent of the Endurance Store and, by consequence, the ECC plan and their associated public interest benefits.

Orsted's position remains that co-existence between Hornsea Project Four and the NEP Project in the Overlap Zone is feasible with certain mitigations, and has drafted protective provisions for inclusion in the Hornsea Project Four DCO on this basis. bp has made extensive submissions to the HP4 examination as to why such provisions are flawed and incapable of addressing the important public interest considerations raised by bp's representations.

Relevance to the NZT DCO

As the Applicants have explained in their previous submissions (REP2-060, paragraph 6.2.8), the Proposed Development's boundary does not extend to the Overlap Zone and so does not have any direct physical conflict or interaction with Hornsea Project Four. Further, there is nothing proposed to be authorised under the NZT DCO which would physically interact with or present an impediment to the project proposed to be authorised under the Hornsea Project 4 DCO. Such interface is limited to the

Endurance Store which is being consented separately from the Proposed Development (**REP1-035**).

The Applicants further clarified in its response to Deadline 1 (**REP1-035**) that the Proposed Development remains acceptable and deliverable in its own right, regardless of the outcome of the dispute in the Hornsea Project 4 examination and the Secretary of State's determination in relation to the interface between the Endurance Store and Hornsea Project 4 in the Overlap Zone.

For the avoidance of doubt, in circumstances where Orsted's submissions into the Hornsea Project Four examination were accepted and no Exclusion Area was provided, so allowing wind infrastructure to be located across the full extent of the Overlap Zone (including the Exclusion Area), the Proposed Development would nevertheless remain, in principle, viable and deliverable. In such circumstances, the Endurance Store could only be developed outside of the Overlap Zone, meaning it would only achieve approximately 30% of its potential capacity. Whilst this would render the ECC plan unviable, the Proposed Development and the offshore elements of the NEP Project would still remain viable, in principle, at this reduced capacity.

Despite the lack of physical/actual interface between the Proposed Development and Hornsea Project Four, the Applicants have included (as Article 49 to the draft DCO) the mirror of the second element of the protective provision previously proposed by bp in the Hornsea Project Four DCO, which sought to disapply the Interface Agreement. As explained above, the drafting of this particular provision is proposed to be amended in the Hornsea Project Four to reflect the above-mentioned revised approach and once its specific drafting has been updated and submitted into the Hornsea Project Four DCO examination (anticipated to be for Deadline 6 on 27 July 2022) then Article 49 will be updated to reflect the same.

The Applicants have previously explained that the rationale for the inclusion of Article 49 was to safeguard the deliverability of the full extent of the Endurance Store for the NEP Project(of which the Proposed Development forms part) and so preserve the viability of the ECC Plan and their associated public interest benefits, particularly in contemplation of circumstances where the Hornsea Project Four DCO were to be refused and so bp's proposed protective provisions not given legal effect, meaning the risk of significant potential compensation under the Interface Agreement remained extant. In such circumstances, this would continue to compromise the potential deliverability/introduce significant potential liability for the delivery of the full extent of the Endurance Store for the NEP Project, and by consequence, the ECC plan. Article 49 also gives the Applicants a degree of control/certainty, which may otherwise be absent were the provision to be limited to the Hornsea Project Four DCO as in such circumstances, Orsted could potentially not implement the DCO before it lapses with the result that bp's protective provisions would not have effect.

Unlike the protective provisions that bp is seeking within the Hornsea Project 4 DCO, Article 49 does not make provision for the Exclusion Area. No such provision is

needed within the NZT DCO, because it only has relevance to a DCO which would otherwise authorise the development of wind turbines within that area.

Assessment of impact on Hornsea Project Four

The Applicants explained in Appendix 6 to their Written Summary of Oral Submission for Issue Specific Hearing 1 [REP1-035] why there is no legal obligation to consider any impact on Hornsea Project Four as part of the Proposed Development's EIA. However, the Applicants undertook to provide a voluntary assessment of the impacts of the offshore elements of the NEP Project on Hornsea Project Four. This assessment is set out below.

It should be understood, however, that such impacts are not the result of the Proposed Development, or any provisions proposed to be included in the NZT DCO, and there is no physical/actual nexus between the Proposed Development and Hornsea Project Four. A decision to make the NZT DCO would not in itself give rise to any of these impacts.

The assessment considers the likely impacts on Hornsea Four Project of being prevented from constructing and operating turbines within the Exclusion Area, as a result of the protective provisions being advocated for by bp in the Hornsea Four examination to preserve the capacity of the Endurance Store.

Scope of Assessment

This document considers the likely impacts on Hornsea Four Project of being prevented from constructing and operating turbines within the Exclusion Area, identifies potential mitigation for those effects, and then considers the likely residual effects.

Predicted Impacts

The Hornsea Project Four development involves the consenting and construction of up to 180 turbines (14 MW capacity), providing 2.5 - 2.6 GW of generation capacity as set out in Orsted's DCO application. The 180 turbines represents the maximum case within the Rochdale Envelope. The actual build-out could involve a smaller number of turbines.

Without mitigation, where Hornsea Project Four were prevented from constructing within the Exclusion Area, it is estimated this could lead to a reduction of approximately

45 turbines from their maximum design envelope, resulting in a potential loss of approximately between 0.63 and 0.67GW of renewable generation capacity.[1]

Sensitivity of receptor

The Hornsea Project Four AfL area is considered to be of high value regionally and nationally, both in economic terms and contributing to government targets set out in the Energy White Paper (Powering our Net Zero Future) and is therefore considered to be of high sensitivity.

Residual Significance (Unmitigated)

Where unmitigated, the impact on Hornsea Project Four will have a residual magnitude of high, which combined with a high sensitivity, results in a residual significance of major adverse (significant) effect.

Mitigation

The location of the Endurance Store, as a geological structure, is fixed, with no ability to be relocated. In circumstances where co-existence over the Exclusion Area is not possible, the potential mitigation considered available to Orsted includes:

- the relocation of its proposed turbines from the Exclusion Area to the residual part of their development boundary. Under this scenario, the total number of turbines could remain as at their maximum design envelope (180), with approximately 45 turbines requiring relocation[2]; or
- building out fewer, larger turbines, so still delivering the 2.6GW capacity proposed within the Hornsea Project Four DCO.

Residual Significance (Mitigated)

In circumstances where the above-outlined mitigatory steps were taken by Orsted, the impact of Orsted being unable to construct Hornsea Project Four within the Exclusion Area will have a residual magnitude of very low (for use of a smaller number of larger turbines) to low (for relocation of the turbines with associated wake loss effects), which combined with a high sensitivity, results in a residual significance of slight adverse (not significant).

[1] Figures derived from Orsted's assessment of the implication of the Exclusion Area narrated in para 5.11.1 of Appendix 1 to their submission at Deadline 1 of the Hornsea Project 4 Examination (REP1-057), electronic page 16.

[2] It is acknowledged that decreasing the spacing between turbines by developing in a smaller geographical area may impact on their performance. The increased density of turbines could produce wake loss effects. Wake loss impacts arise from increasing the density of turbines in a specific area that reduces the power generation capacity of the turbines towards the centre of the array due to reduced wind resource.

APPENDIX 2 – BP'S RESPONSE TO ORSTED'S DEADLINE 5 SUBMISSIONS

Deadline 5a submission

BP'S RESPONSE TO DEADLINE 5
COVER NOTE

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1. BP'S RESPONSE TO ORSTED'S DEADLINE 5 SUBMISSIONS

1.1 BP Exploration Operating Company Limited ("bp") has prepared this submission in response to Orsted Hornsea Project Four Limited's ("Orsted") submissions at Deadline 5.

1.2 In particular, bp has responded to:

1.2.1 Orsted's submissions in respect of bp's technical evidence (REP5-075) in Annex 1 to this response (including as Appendix 1, the responses to the requests for additional information); and

1.2.2 Orsted's comments on bp's legal submissions (REP5-076) in Annex 2 to this response.

1.3 bp is happy to address any queries the ExA may have in respect of these responses in the upcoming hearings later this month and then in writing at Deadline 6 as appropriate, where bp also intends to provide a further version of its protective provisions (Version 3 having previously submitted as Appendix 1 to its Deadline 4 response (REP4-059)) to incorporate elements of its submissions as referenced in Annex 2 to this response.

ANNEX 1

RESPONSE TO ORSTED'S SUBMISSIONS ON BP'S TECHNICAL EVIDENCE

Deadline 5a – 4 July 2022

BP'S RESPONSE TO XODUS TECHNICAL REPORT COMMISSIONED BY ORSTED

1. INTRODUCTION

1.1 At Deadline 5, Orsted submitted a report prepared by Mr Andrew Sewell of Xodus Group Limited ("Sewell Report") which is presented by Orsted as a 'independent report' commenting upon the technical submissions made by bp and Orsted to date in relation to the possibility of seismic monitoring in any overlap zone between the Northern Endurance Partnership carbon capture use and storage project ("NEP project") and Hornsea Project Four ("HP4").

1.2 Detailed technical points and questions are raised by Mr Sewell in the report. Given the limited time available, the bp technical team has responded to the specific "Request to bp for additional information" set out at in Section 4.1 of the report (see Appendix to this submission). However, bp intends to submit a further technical response to wider issues raised by the report at Deadline 6.

1.3 The purpose of this submission is to summarise bp's position in relation to the Sewell Report's conclusion and recommendations, in terms of their implications for the cases being put forward by Orsted and bp. It has been prepared by Herbert Smith Freehills LLP in close collaboration with bp technical personnel including subsurface geophysicists and reservoir engineers involved in the NEP project and bp's global Seismic Delivery Manager. We hope that this submission will assist the Examining Authority ("ExA") in focusing on the key issues it may wish to discuss during the hearings scheduled for week commencing 18 July 2022.

1.4 While it is not presented as such by Orsted, we consider that the report in fact supports the case that bp has put forward for the need for an Exclusion Area.

1.5 Moreover, the report does not tackle bp's concerns with regard to rig access, helicopter access or relief well access, each of which also necessitates the imposition of an Exclusion Area.

1.6 This response also comments on a number of fundamental points in relation to the commissioning of the report, its scope and approach, which bear upon the weight it should be given by the ExA. The relevance of the cost of OBN, and the precedents set by the Sleipner and Snohvit projects, are discussed at a high-level in this context insofar as necessary to expose the flaws in seeking to use these arguments to support Orsted's case.

1.7 The Sewell Report suggests that OBN and P-cable monitoring is a solution which would enable the development of the NEP project and HP4, thus delivering Government aspirations. The opposite is in fact true. If the Government wishes the ECC plan and HP4 both to be delivered then only protective provisions in the HP4 DCO which exclude wind development in the Exclusion Area will achieve this – enabling the full development of the NEP project, and the development of HP4 adjacent to it. Orsted is offering no solution to the risks accepted by the Sewell Report, or the risks relating to access which are not tackled by the report.

2. THE APPOINTMENT OF MR SEWELL

2.1 Orsted's Deadline 5 submission states that: Andrew Sewell "*was instructed to provide independent advice, on the evidence submitted to the Examination to date, by the Applicant and bp, in so far as it relates to the monitoring of the Endurance aquifer, with and without the*

proposed authorised development collocating the area of seabed referred to in this Examination as the overlap zone". The claim is made by Orsted that "*Mr Sewell's advice can give the ExA and Secretary of State confidence that it is not necessary to adopt bp's position and exclude Hornsea Four from the overlap zone at the point of determining the DCO application*."

2.2 Mr Sewell states in the Introduction to his report that: "*I am aware that evidence has already been submitted to the examination by both parties. I have considered all of that and the purpose of this report is to provide an independent, desk-top review of the available evidence to assist the Examining Authority in its understanding of it. I have adopted a position of policy and technology neutrality and opined only on matters of a technical nature relating to seismic surveying and the requirements of MMV for CCUS projects.*"

2.3 As the ExA will be aware, Orsted has previously commissioned and submitted to the ExA an 'independent report' by OREC ("OREC Report") on the technical feasibility of co-location and monitoring (REP1-057, Appendix 1.1, electronic page 22). It is notable that:

2.3.1 The Sewell Report confirms (p31, section 2.6.3, second paragraph) that the OREC Report was 'largely completed' before bp's Technical Assessment[1] was provided to Orsted. This is despite the fact that the OREC Report was issued to bp after bp's Technical Assessment was provided to Orsted. bp provided its Technical Assessment to Orsted, BEIS, The Crown Estate ("TCE") and the Oil and Gas Authority (now known as the North Sea Transition Authority ("NSTA")) on 3 December 2021. The OREC Report is dated 24 January 2022 and was not submitted to the ExA until early March when Orsted made its Deadline 1 submission, which was three months after Orsted had received bp's Technical Assessment.

It seems therefore that OREC was not asked by Orsted to review and revisit the analysis and conclusions in the then draft OREC Report before it was finalised (in January) to take into account all of the detailed information presented in bp's Technical Assessment in relation to the specific challenges of co-location in the Endurance location. As Mr Sewell states: "*it does not refer or respond to it in any way*." No explanation has been provided for that very surprising and critical omission, either by OREC or Orsted. Mr Sewell's subsequent report does not shed any light on the matter. In failing to ensure that OREC took into account and engaged with the material in bp's Technical Assessment, Orsted clearly undermined the balance and utility of the OREC Report and contributed to its failure to provide an accurate and reliable assessment of the issues with co-location. In Mr Sewell words, this might have resolved some of the *"inconsistency that bp is questioning"* (p31, section 2.6.3, second paragraph);

2.3.2 It is notable that Orsted, without explanation, has chosen not to seek an updated view from OREC in light of bp's submissions to the examination, but instead to instruct a new 'independent expert', Mr Sewell;

2.3.3 While Orsted suggests that the ExA should have confidence in the conclusion of the Sewell Report on the basis that it is an 'independent report', it is striking that the OREC Report was also provided by Orsted as an 'independent report', and commended at the point of submission to the ExA as providing "*a more realistic overview on risks and opportunities of co-existence*" than that provided by bp

[1] "A Technical Assessment of the Endurance Reservoir and Hornsea Four Project Four Wind Farm" ("bp Technical Assessment") (REP1-057, Annex 1 to bp's Position Statement submitted at Deadline 1, electronic page 147)

(REP1-057, Appendix 1, paragraph 5.7, electronic page 22). Mr Sewell does not himself describe the OREC Report in those terms, and indeed it is clear that Mr Sewell does not agree with some of the key findings of that report. bp will comment in more detail on this at Deadline 6, but in particular Mr Sewell takes the view that ocean bottom nodes ("OBNs") used in conjunction with short streamers (P-cables) are the only feasible solution to monitoring any overlap area, in contrast to the position taken by OREC that there are, or could be in future, many different technical solutions. Mr Sewell states categorically that: "*OBN is going to be the only realistic way to acquire data in a wind farm, probably in combination with short streamers (P-cables)*" (section 2.3, p23, fifth paragraph). He does not believe that the alternative technologies referenced in 3.3.1 of the OREC Report will provide a replacement technology for 3D seismic "*for a long time*" (p11, section 2.1, fourth and fifth paragraph). Similarly, in the final paragraph on page 27, where Mr Sewell discusses bp's Position Statement, he states that: "*In section 8, bp states that the seismic technology described in the second OREC-NZTC report is immature and not suitable for the CCUS 4D. Also that the report agrees with bp's view and supports its case. As discussed elsewhere, I would agree with bp that some of the options suggested in the OREC-NZTC report would not be suitable, however the use of OBN is potentially suitable and further work to demonstrate this is required.*" This is helpful to bp and the Examination in narrowing the focus of bp's technical response to the suitability or otherwise of non-towed streamer solutions, but the rapid abandonment by Orsted of its first independent consultant's report on the difficult technical issues that arise here, presented to the ExA and to bp with such initial confidence, is important in itself. It underlines the need for the ExA and the Secretary of State to subject the latest such report to keen scrutiny;

2.3.4 Orsted did not invite bp to jointly select and instruct an independent expert to compile a report. bp was not in fact aware that such a report had been commissioned until it received it shortly before Deadline 5. Had the purpose of this report been to set out a full and unbiased view for the ExA of the challenges and potential solutions to monitoring, we would have expected bp to have been involved in the selection of the expert and (at the very least) to have been invited to participate in a dialogue (alongside Orsted) with the expert to address queries as they arose during his consideration of the issues; and

2.3.5 The reference documents Mr Sewell identities in Section 5 of his report do not constitute a full set of the materials relevant to the issues discussed in his report, including various presentations shared with Orsted. Notably, Mr Sewell does not refer in Section 5 to an "Endurance 4D Seismic Feasibility" presentation made in December 2021 during a workshop involving bp and Orsted. That presentation, which discussed the feasibility of potentially using P-cables and OBN, is highly relevant to items 4 and 5 in Section 4.1 of the Sewell Report (his "Request for additional information from bp"). The fact that Mr Sewell refers in Section 5 to an October 2021 presentation (see item 7 listed in Section 5) but does not refer to the December 2021 presentation is surprising as bp would have expected Orsted to provide the document to Mr Sewell, particularly when Orsted saw the requests set out in Section 4.1 of the Sewell Report.

2.4 For all of the above reasons we respectfully ask the ExA to be circumspect in its consideration of the Sewell Report, and to ensure that its analysis and findings are subject to careful scrutiny in light of bp's technical responses to its contents.

2.5 As a major international energy company bp and its technical personnel have deep experience and expertise in seismic acquisition, including designing and executing seismic acquisition programmes that satisfy the requirements of relevant regulators and ensure

seismic data is acquired in as safe and reliable a manner as possible. Its work with third party seismic companies and vessel owners and operators means bp also has a deep understanding of the many operational and logistical issues involved in designing and acquiring seismic data in an offshore environment as well as various practical issues that arise (e.g. the number of vessels, nodes and crews available globally at a given time). Importantly, bp pioneered the use of OBN for industrial applications and carried out the first major OBN field trial in 2005 and in 2011 it pioneered the use of nodal seismic for 4D in the Gulf of Mexico. Additionally, bp was one of the first companies to embrace 4D streamer seismic in the North Sea during the late 1990s, and in 2003 it was the first to install a permanent seismic monitoring array (over the Valhall field in the Norwegian section of the North Sea). bp has acquired many 4D seismic surveys over the years.

2.6 bp also is able to draw on the seismic acquisition experiences and expertise of its partners in NEP, and together they have unparalleled experience in managing operational risk for CO2 storage monitoring.

2.7 The extensive work undertaken on the NEP project during the last few years also means that bp and its technical personnel have a much more detailed understanding of the Endurance aquifer and the seabed conditions in question than either Mr Sewell or OREC.

3. THE FRAMING OF THE QUESTION ADDRESSED BY MR SEWELL

3.1 It is also important to note the framing of the question which Mr Sewell answers within his report. That question appears to be, essentially: assuming that there is a need for wind farms to co-exist in the same location as CCUS, how might the CCUS facility be monitored?

3.2 This is evident from various statements throughout the report, including:

3.2.1 In the Executive Summary on page 8: "*…if it is necessary to find a way for wind farms and CCUS to co-exist, then conventional towed streamer (with cables longer than 1km) is not possible and OBN is the only viable technology, probably combined with a system such as a P-cable. This latter option may be more expensive in terms of seismic costs, but the overall economic and environmental value of having both a wind farm and a CCUS project operating in the same area could outweigh this additional cost.*" This statement is largely repeated in the Conclusion of the report;

3.2.2 Mr Sewell's concluding thoughts in respect of bp's Technical Assessment (p26), where, in the context of setting out the challenges with OBN, he nevertheless states: *"However, if towed streamer cannot be used in a wind farm, and both CCUS and wind farm projects are approved, then OBN/OBC will be the only option for acquiring 3D seismic"*; and

3.2.3 "*Referring back to the frames I described in the Introduction, if one determines that it is important to find a way for the two projects to co-exist then the task is to show through modelling, and/or field trials, that adequate seismic data can be acquired for the given turbine spacing*" (p29, section 2.5, second paragraph).

3.3 It is clear that Mr Sewell has misdirected himself (or been misdirected by Orsted), and thereby misunderstood the 'task' or question that arises as a result of bp's technical evidence and objection.

3.4 No matter how strong the public interest in the development of both CCUS and wind farms, and the desirability therefore of both being able to be co-located, it must be recognised that:

3.4.1 NEP is a commercial entity whose Directors have legal duties to act in the best

interests of the company and who will not make a financial investment decision in June next year to fund the development of the project unless they are satisfied that the risks of so doing are commercially acceptable; and

3.4.2 The NSTA, who is the regulator of offshore carbon dioxide storage, will not approach the question of what is acceptable in terms of safe and effective monitoring, and what constitutes the "best available technology" for monitoring based on what is the best available technology given the constraints imposed by the existence of a wind farm above Endurance. This misconception is made plain in Mr Sewell's statement that "*if BEIS decides that co-existence is compulsory then the NTSA will take account of the limited options (ie no towed streamer, greater than 1km)"* (emphasis added). Firstly, BEIS cannot 'compel' commercial entities to develop projects in particular locations which would deliver co-existence if those commercial entities do not consider the risks created as a result to be commercially acceptable. A decision by the Secretary of State to allow Orsted to place wind turbines in the Exclusion Area would not therefore make co-existence 'compulsory' in any meaningful sense. Nor would it remove the obstacles to co-existence that bp's evidence has identified and explained. Secondly there is no evidence that the regulator either will or should be willing to compromise its standards for this first of a kind development in order to consent the Endurance store on the basis of uncertain or sub-optimal monitoring technology.

3.5 Moreover, Mr Sewell's approach fails to take account of the fact that the protective provisions that NEP is seeking would not prevent the development of Hornsea 4 wind turbines in the area adjacent to the Exclusion Area. In other words, this is not the "either wind or CCUS, but not both" scenario upon which Mr Sewell premises his analysis and comments.

3.6 Therefore the questions which the ExA and Secretary of State must consider (based on evidence provided during this Examination) are:

3.6.1 Firstly, whether monitoring technology exists which the evidence demonstrates is likely to give sufficient confidence to the NEP partners to take a financial investment decision in June next year to fund the NEP project assuming Orsted is permitted by the HP4 DCO to construct a wind farm in the Exclusion Area; and

3.6.2 Secondly, whether a monitoring solution exists which the evidence demonstrates is likely to satisfy the NSTA when bp seeks the Endurance store permit, and throughout its lifetime, assuming Orsted is permitted by the HP4 DCO to construct a wind farm in the Exclusion Area[2]. This second question is, of course, directly linked to the first, as it will be a key part of the weighing of risks by the NEP directors.

3.7 The need to take the final investment decision in June 2023 is not an arbitrary date agreed between the NEP partners. It is driven by the Government's timetable to deliver the NEP project as part of the ECC plan and the commitments that the NEP partners have made to Government in securing the role of delivering the ECC plan. BEIS selected the ECC, supported by the NEP project, as one of two Track-1 clusters for delivery by the mid-2020s in October 2021 after commencing the Cluster Sequencing Process in February 2021. The NEP investors will need to take a final investment decision in June 2023 to progress through to detailed engineering construction, commissioning and start-up in order to meet the

[2] Furthermore, the evidence would need to demonstrate that there is a monitoring solution likely to be satisfactory to BEIS, Ofgem and the Treasury, because if storage needed to be stopped because of monitoring issues in an area of overlap, industry would not be able to store the Co2 and taxpayers would bear the significant cost of a redundant project.

commercial operations date and support the Government's strategic ambition of 20-30MTPA of CCUS capacity by 2023[3].

3.8 The ExA and Secretary of State must deal with the reality of how decisions by the NEP partners and regulators allowing the project to be delivered will be taken. Orsted's submissions and evidence to date simply fail to grapple with that reality, and the suggested 'solutions' advanced are fundamentally flawed as a result.

3.9 Given that Mr Sewell states that in his view the only possible technology which might enable monitoring of Endurance with a wind farm in situ is OBN plus P-cables, the question Mr Sewell should be asking is whether the consequences of having to rely on the use of OBN plus P-cables would put at risk the ability of the NEP partners and the NSTA to make positive decisions with regard to development of the NEP project next year, in circumstances where the HP4 DCO authorises turbines to be located in the Exclusion Area. If the evidence shows (as it plainly does) that the ability to make such positive decisions is put at risk, a solution needs to be identified which addresses that risk and ensures that the ability to achieve the objectives underlying the ECC plan is not jeopardised by the approval of the HP4 DCO.

3.10 Mr Sewell states that: "*Currently the regulator's view on seismic technology to use for CCUS is not fixed yet and one would hope that they would be open to any method that can be shown to have a high chance of succeeding through suitable modelling and field trials*" (p28, third paragraph). bp and the other NEP partners will not be willing to take a financial investment decision in June next year to progress the project based on this 'hope', which they consider entirely unrealistic. The role of modelling, survey designs and field trials is discussed specifically in section 8 below and the Appendix to this Submission, however, bp believes these are not activities that would assist or be feasible to undertake given relevant time constraints.

4. REFERENCES TO SLEIPNER AND SNOHVIT

4.1 The Sewell Report accepts that there are currently only two offshore saline aquifer CCS projects globally, Sleipner and Snohvit, and that both use towed streamers to obtain 3D/4D seismic data.

4.2 Mr Sewell makes the point repeatedly that:

4.2.1 "*that does not mean that all future CCS projects need to use towed streamers*" (fifth paragraph on p32, in section 2.6.3: bp's response to the Jan 2022 OREC/NZTC report)

4.2.2 *"bp is essentially recommending that future projects have to follow the Sleipner model. This is quite a restrictive approach"* (fourth paragraph on p28, in section headed: bp's position paper (summary); and

4.2.3 *"While these provide valuable insights, they cannot be said to define how CO2 storage should be done offshore in all future cases*" (p34, paragraph immediately

[3] h[redacted]

below table in section 3: Conclusion).

4.3 These statements, taken as a criticism of bp's position, suggest a naive mis-understanding of the realities of how decisions will be taken with respect to the NEP project by investors and regulators. As explained above, there are two crucial decisions to be made – one by the NEP partners as investors, and the other by the NSTA as the regulator of offshore carbon dioxide storage. Both will want a high degree of certainty that the monitoring technology to be used will lead to high quality data, sufficient to accurately monitor the CO2 plume (even if it starts to behave in an unexpected manner).

4.4 NEP partners must demonstrate to the NSTA in their applications for consents (store permit) in relation to the Endurance store that the proposed approach to monitoring constitutes the 'best available technology'. As set out in bp's Position Statement submitted at Deadline 1 (REP1-057, Appendix 2, section 9.6, electronic page 133)**,** even if trials of dense OBN and P-cables were implemented today, it would take a number of years to obtain the requisite data to ensure the NEP project could be progressed in reliance on using them to acquire seismic data at Endurance (see section 8).

4.5 Until such time as that sort of field study is funded and carried out (perhaps with grant funding from the Offshore Wind and CCUS Co-location Forum or similar) and the results are positive, the tried and tested techniques used at Sleipner and Snohvit will remain the 'best available technology' – and the technology which investors will wish to be able to use in order to commit to fund the NEP project.

4.6 Mr Sewell may regard this as an unfortunate restriction on the potential deployment of alternative technologies which would enable co-location with wind farms, but both bp, the ExA and the Secretary of State must deal with the realities of the state of scientific understanding today and with the barriers to any immediate leaps in the development of alternative technologies. Within the timeframe necessary to deliver the ECC plan no such technologies could be sufficiently tested, as explained further in section 8.

5. THE APPROACH TO THE BURDEN OF PROOF

5.1 The Sewell Report suggests throughout that the burden of proof is on bp – to prove that OBN and P-cables will not provide adequate data. The following statements are made, for example:

5.1.1 *"bp has not yet presented clear evidence via modelling and design work that OBN (plus P-cable) will not provide an acceptable solution for Endurance";* and

5.1.2 *"While I agree that there is a potential problem for ocean bottom systems at present bp's opinion is not supported with evidence" (p30, section 2.6.2, fourth paragraph).*

5.2 With these and other similar statements, the Sewell Report seeks to suggest that it is for bp to prove that OBN plus P-cable will not provide a solution which will be acceptable to the NSTA. The implication is that if bp cannot provide this evidence to the ExA then the ExA should grant the HP4 DCO without any Exclusion Area.

5.3 This is misconceived. As explained above, the correct test should be whether having regard to the available evidence there is a significant risk that the ECC plan will not be delivered in the event that the Exclusion Area is not imposed on the HP4 DCO, by reason of the lack of confidence of investors linked to the risk that the regulator would not approve use of OBN plus P-cable, and that monitoring would be insufficient for liability handover at the end of the life of the CCS facility. If the Secretary of State believes this to be the case then he should impose the Exclusion Area in the HP4 DCO if he wishes to ensure the ECC plan is delivered.

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6. COST AS A FACTOR

6.1 The Sewell Report repeatedly suggests that cost is an over-riding factor in any concerns bp has about the use of OBN and P-cable as opposed to towed streamers. The suggestion is made that if OBNs were situated sufficiently densely then the data obtained (in combination with data from P-cables) might be of sufficient quality. The point is made that this "*may be more expensive in terms of seismic costs, but the overall economic and environmental value of having both a wind farm and a CCUS project operating in the same area could outweigh this additional cost*" (Executive Summary, second paragraph, p8).

6.2 The Sewell Report states that: "*The actual cost comparison between OBN and towed streamer will depend on the survey designs used and can be calculated more accurately[…] during detailed survey evaluation and design study*" (p14, section 2.2, second paragraph); and that "*There is always a trade-off between cost and data quality when designing a seismic survey. Unless modelled, it cannot be quantified*" (p14, section 2.2, final paragraph on p14).

6.3 As explained in bp's Position Statement submitted at Deadline 1 (REP1-057, Appendix 2, section 9.8, electronic page 133), the cost of technologies other than towed streamers is likely to be much greater. Accordingly, if NEP invested on the basis that in future it would be able to deploy some sort of new and as yet unproven approach of using dense OBN and P-cables to acquire seismic and monitor CO2 within a wind farm, NEP would be taking the risk that any extra costs arising from the use of such an approach would be 'disallowed' by the regulator under the TRI model (on the basis that these costs are excessive compared with existing proven technologies and monitoring techniques). If disallowed such costs would end up being borne entirely by the NEP partners. This is not a risk which any responsible investor would take.

6.4 Orsted's first 'independent report' (the OREC report) states in its conclusions (REP1-057, Appendix 1.1, paragraph 6.1, electronic pages 88-90) that: "*Ocean bottom nodes do not have the same issues as towed streamer acquisition but the cost of acquiring the data is high, potentially up to ten times that of surface seismic, and image quality of the seabed and shallow subsurface can be significantly affected depending on the spatial sampling of the nodes*."

6.5 As part of bp's engagement with Orsted, BEIS, TCE and the NSTA over the past year, bp has considered in some detail the potential cost of OBN-based monitoring versus towed streamers. In June 2021, bp co-created with Orsted a presentation to TCE, NSTA and BEIS on the possibility of overlap scenarios and their impacts on both projects. As part of this, the cost of OBN was estimated to be £130m[4] over the lifetime of the development (assuming node receiver spacing of 200 x 50m). bp subsequently, during an October 2021 presentation focussed on OBN, provided to Orsted, TCE, NSTA and BEIS estimated costs of between £260m to £315m, based on assumed receiver spacing of 50 x 100m and source spacing of 25 x 25m (reflecting the shallow water depth of circa 60m at the Endurance aquifer). These estimated costs prepared in May/June 2021 and October 2021 were based on current pricing and the number of surveys envisaged at the time the estimates were made. The estimated costs would need to be updated to reflect the number of surveys in the MMV plan that forms part of the process whereby the NSTA grants the Endurance store permit. In the meantime, it is clear that the cost of OBN would undoubtedly be substantially larger than the estimated total cost of towed streamer surveys over the lifetime of the project, estimated to be £17m (as also set out in bp's October 2021 presentation).

6.6 The latest version of Orsted's protective provisions suggests that a component of the co-existence and proximity agreement to be entered into between bp and Orsted might cover

[4] Uninflated and undiscounted

"*an allocation between [Orsted] and/or [bp] of the cost of monitoring based on an objective and independently verified assessment of the difference in cost between monitoring undertaken with and without the authorised development in the overlap zone.*" However, there is no suggestion about the basis on which the significant cost of OBN and P-cable monitoring might be shared and this is not something which Orsted has previously raised as a possibility with bp. The working assumption of all meetings between the above-named parties in relation to use of any monitoring technology has always been that whatever technology is used the cost (like all other project costs) must be as low as possible in order for the TRI regulator to justify 'allowing' the cost as a pass through to emitters, where there is a potential requirement for Government support through the Industrial Carbon Capture and Dispatchable Power Agreement business models.

6.7 However, it should be clear from this submission and from bp's previous submissions that cost is by no means the only important factor supporting bp's view that towed streamers are the appropriate means of monitoring Endurance.

6.8 Bp accepts that in a 'blue water' situation (ie where there is no impediment due to a wind farm) then dense OBN could create an image as good as towed streamers (albeit at much greater cost and still with operational challenges and so would not be a technique that would be used for Endurance). In a situation where monitoring of Endurance is constrained by a wind farm however, all of the technical problems identified in this submission and previous bp submissions come into play, regardless of cost.

7. MR SEWELL'S CONCLUSION AND RECOMMENDATIONS AND ORSTED'S PROTECTIVE PROVISIONS

7.1 While Orsted does not put them forward as such, Mr Sewell's Conclusion and Recommendations are in fact supportive of bp's position.

7.2 One of the main challenges that bp has identified in relation to the deployment of OBN is seabed conditions. Mr Sewell acknowledges these concerns:

7.2.1 "*I agree that these sand waves on the seabed could be a challenge for OBN"* (p14, section 2.2, fifth paragraph); and

7.2.2 *"In 2.19 to 2.24 bp makes the argument that ocean bottom systems, and OBN in particular, will be susceptible to the receivers being moved around by the sand waves on the seabed in the Endurance area. In my opinion this is likely to be the main technical challenge for the use of nodes in this area. If too many nodes change position during the acquisition of the survey then it will degrade the 3D imaging and the utility of the data for the 4D monitoring"* (p32, section 2.6.3, second paragraph).

7.3 Mr Sewell's central contention is, however, that bp needs to do more studies and modelling before coming to the conclusion that OBN (in combination with P-cables) will not provide adequate data quality. The first two paragraphs of his Recommendations state:

7.3.1 **"***The key recommendation is that comprehensive evaluation of different seismic acquisition processing techniques and survey designs, using an approach such as forward modelling is needed to investigate the impact on imaging from the seabed to Bunter, and thus the ability to monitor the spread of the CO2 plume. Part of this evaluation should include field trials investigating, for example, if the sand waves on the sea bed at the Endurance site will cause a significant problem for the use of ocean bottom systems. The modelling work undertaken prior to 2016 as part of the White Rose project planning, as described in the K42 report could be used as a basis and refreshed.*

*The modelling would also be able to investigate the potential acoustic noise of an operating wind farm and its impact on the quality of seismic data recorded during 3D surveys***."**

7.4 Orsted suggests that their revised form of protective provisions, submitted at Deadline 5, address the need for further studies and surveys as recommended by Mr Sewell. It is said by Orsted that their protective provisions: "*provide a mechanism for the necessary preparatory work to be undertaken between the two projects. If agreement cannot be reached, then it is for the Secretary of State to determine following arbitration*". Orsted further suggests that their *protective provisions "provide adequate protection for the NEP Project. They also offer the Secretary of State the opportunity to grant consent without having to decide whether offshore wind should trump CCUS, or vice versa*".

7.5 This is not in any way an accurate description of the protective provisions as drafted by Orsted.

7.6 Orsted's protective provisions now include a definition of an "evaluation", which is defined to mean modelling and field studies of different seismic monitoring approaches including the impact of noise from the wind turbines, an evaluation of the financial feasibility of carrying out both towed streamer and OBN baseline surveys, and "*field trials to determine the appropriate size of exclusion zone required in respect of vessels deployed on the NEP Project*".

7.7 Assuming the studies that Mr Sewell envisages were carried out, one realistic possible outcome must be that those studies show that OBN and P-cables will not in fact be suitable for use. However, Orsted's protective provisions do not appear to cater for that outcome, or address its adverse consequences for the public interest. The "*evaluation*" is only referenced in paragraph 2(c) of the protective provisions, which states that in the event that, among other things, bp "*has not undertaken and completed the evaluation and shared that with [Orsted]*", the schedule of protective provisions no longer has effect.

7.8 We do not see how this in any way protects the NEP project, or gives the Secretary of State the opportunity to provide for an Exclusion Area at a later date should it be shown via the "*evaluation*" that one is needed. The Secretary of State's only role in the provisions as drafted is to determine "*the outstanding matters in dispute"* in relation to the negotiation of a co-existence and proximity agreement in the event that "*no co-existence and proximity agreement is concluded*" (paragraph 11). It may be that Orsted is assuming that if bp refuses to enter into such an agreement on the basis that the proposed form of agreement allows for co-existence in an area of overlap, then the arbitrator appointed by the Secretary of State could make a determination in relation to this fundamental issue under paragraph 11 (ie requiring the co-existence and proximity agreement to provide for an exclusion area). However, if this is the intention then the protective provisions drafting would need to make consideration of this matter a much clearer, and separate, part of the post-consent process.

7.9 In any event, however, any version of the protective provisions which attempts to defer until a later date the decision on whether co-existence in the Exclusion Area is possible based on further studies is unworkable for the reasons set out in section 8 below. In particular, it should be noted that the timescales envisaged by Mr Sewell for modelling and field studies leading up to a final investment decision in June 2023 (as shown in the diagram accompanying Mr Sewell's Recommendations, on page 36) are entirely unrealistic for the reasons explained.

8. FLAWS WITH THE SUGGESTION THAT MODELLING AND FIELD STUDIES CAN DEFER THE DECISION

8.1 As explained above, Orsted's current drafting of the protective provisions does not expressly provide for a decision point post-grant of the DCO as to whether OBN plus P-cable (or similar

technology) is feasible based on further modelling and studies. However, clearly such drafting could be provided for. It is therefore important to explain why any such proposal would not be workable in any event. The response to the Sewell Report which bp intends to submit at Deadline 6 will elaborate upon the problems with this suggestion, but we summarise various fundamental flaws with this proposal below.

Fundamental problems with creating any meaningful model

8.2 There are no real world examples of OBN plus P-cable surveys occurring within the boundaries of a wind farm. For any model to be meaningful, it must therefore be based on assumptions about how seismic acquisition in respect of Endurance might be carried out with that constraint. In other words, the inputs to the model must be robust. This immediately poses a problem for the following reasons:

8.2.1 Mr Sewell suggests that P-cables might be able to be used as close as 100m from wind turbines. However, bp does not consider such an assumption to be plausible. Given issues of safety and practicality (including the concerns of vessel operators who have their own requirements for safe operations), bp would not consider it safe to model use of P-cables based on less than 500m distance from turbines;

8.2.2 What assumption should bp make about the ability to place and retrieve nodes in specific locations near to turbines, given the variable currents and seabed conditions?

8.2.3 Over what timeframe should the model assume that a dense array of OBNs can be laid? bp does not consider that dense OBN within a wind farm could be laid in a single season. Apparently this is not something Mr Sewell has considered or addressed, despite bp having told this to Orsted in November 2021 in a document listed in Section 5 of the Sewell Report (see bp's response in the Appendix to this submission to Request 6 in Section 4.1 of the Sewell Report);

8.2.4 What assumption should be made about the ability to source sufficient nodes and crew from a finite global pool? The availability of large numbers of nodes required for a dense OBN survey of this size and the crew required to execute the survey is far from guaranteed[5], particularly at a time of high oil prices. These challenges also would exist for any small field trial;

8.2.5 What assumptions should the model make about the ability to repeat all of the above consistently around turbine obstructions over the lifetime of the project (4D modelling)?

8.2.6 What assumptions should be made about noise from turbines and seismic reflections in the water column? This is very hard to characterise in a model; and

8.2.7 Turbine locations would need to be assumed in the model, yet Orsted will not be able to confirm to bp at this point in time where their turbines would be located. This is partly because, as set out in the bp Technical Assessment (REP1-057, Annex 1 to Appendix 2, section 6.4, electronic page 170), the NEP project must be developed on a 'appraise while develop model' such that NEP will not be able to tell Orsted in advance where its wells will be drilled and therefore where Orsed may locate its turbines to be compatible with NEP's evolving needs.

[5] See bp's response in the Appendix to this submission to Requests 2 and 6 in Section 4.1 of the Sewell Report

8.3 For all of the above reasons, the creation of inputs to any model is likely to contain a large degree of uncertainty, lacking validated data, and the approach bp would wish to adopt to such assumptions may itself be something which would be capable of much challenge and debate.

The need for pre-modelling field trial(s) to establish operational limitations

8.4 bp's technical team considers that it would be essential to carry out pre-modelling field trial(s) in order to inform the modelling assumptions about operational constraints, followed by more extensive field trial(s) post-modelling to look at the impact on 3D/4D imaging/modelling. The pre-modelling trial(s) would include engagement with the contractors who would carry out the surveys, in order to understand the practical operational constraints and risks, such as whether it is possible to find vessel owners/operators willing to sail as close as 100m to wind turbines.

The need for field trials following modelling

8.5 As Mr Sewell suggests, modelling alone of OBN and P-cables could not demonstrate that it would be possible to acquire 3D and 4D data of sufficient quality within a wind farm. Modelling is indicative only and illustrative of a likely 'best-case' scenario of what is theoretically possible. As explained above, a model is also only useful to the extent that its inputs represent accurately all likely limitations, including operational constraints.

8.6 Modelling does not prove operational or real-life feasibility and data quality in the presence of predictable (let alone unexpected) complexities of real seismic acquisition operations and real data characteristics. Even field trial results would be subject to uncertainty if they were not conducted within a similar wind farm (or equivalent obstructions), or in the context of similar seabed conditions and bathymetry as exist over Endurance.

8.7 For the reasons set out below, the time it would take to conduct pre-modelling field trial(s), plan and carry out reliable modelling and conduct post-modelling 3D and 4D field trial(s) which would provide the necessary confidence (assuming they were successful) is clearly incompatible with the NEP partners' need to take a financial investment decision in June 2023 in order to deliver the ECC plan.

Timing and cost of modelling

8.8 bp estimates that carrying out a basic modelling exercise for OBN plus P-cables would take approximately 4-5 months. If a more detailed model were to be created, seeking to illustrate the movement of sand waves and other sensitivities, the total cost would quickly escalate to an estimate in the region of $4m, and the time taken would be closer to 9 – 10 months. However, even a model of this type would still only cover a very basic set of assumptions with regard to operational limitations.

Timing and cost of any field trials

8.9 To provide robust conclusions about the ability to use OBN and P-cable monitoring around a wind farm, field trials would need to be carried out over an extended period of time. In particular, having measured sand waves at a particular point in time, there would be a need to do repeat surveys at intervals of approximately a year in order to show how far they move and change shape over time. It would not be sufficient to carry out a single repeat survey at a one year interval, as it is possible that that single year is not representative of how the sand waves will behave over a longer period. There could be inconsistency in how they behave from one year to the next. In other words, it would not be sufficient to simply carry out a single survey field trial (a 3D data acquisition) but rather it is necessary to study data acquisition over a number of years (4D acquisition).

8.10 The cost of such a field trial is impossible to quantify precisely, as assumptions about the

nature and scale are highly theoretical, however bp would expect any such trial to take a number of weeks and be costly. For example, a single trial taking between 6-8 weeks is likely to cost ~$10-15m. Furthermore, this (and the cost of modelling) is a cost which the TRI regulator could seek to reasonably 'disallow' and therefore represents an unacceptable cost risk to NEP investors unless funded by a third party.

Incompatibility with FID timeline

8.11 It is clear from the above that there is no possibility of the necessary modelling and field testing (pre and post modelling) being carried out before the scheduled date for NEP's investment decision in June 2023. In any event bp would not be willing to put forward this monitoring approach for approval by the NSTA because of insufficient certainty that it would provide a workable solution in practice either (i) for predicted conditions or (ii) for unexpected circumstances where critical corrective measures are required or additional monitoring is needed (see below).

Unexpected circumstances where corrective measures are required

8.12 Even if a field trial involving several years of survey data were to suggest that using OBN plus P-cables within a wind farm and with conditions like Endurance could generate time lapse high quality data, bp would still have concerns about being forced to rely on this technology in circumstances where:

8.12.1 Corrective measures (e.g. the drilling of a relief well) may be needed in locations which cannot be predicted in advance; or

8.12.2 The need for a localised seismic survey were to be triggered, due to suspected non-containment or non-conformance of the CO2 plume.

8.13 If such relief wells or localised additional monitoring are needed to be drilled/carried out directly beneath or in the immediate vicinity of a wind turbine, such operations would be severely compromised if not impossible.

8.14 In addition, even in the best case scenario of minimal exclusion zones of 100m around the wind turbines (which as explained above bp does not consider realistic), the data obtained from surveys conducted using OBN and P-cables will have significant “gaps” around the turbines.

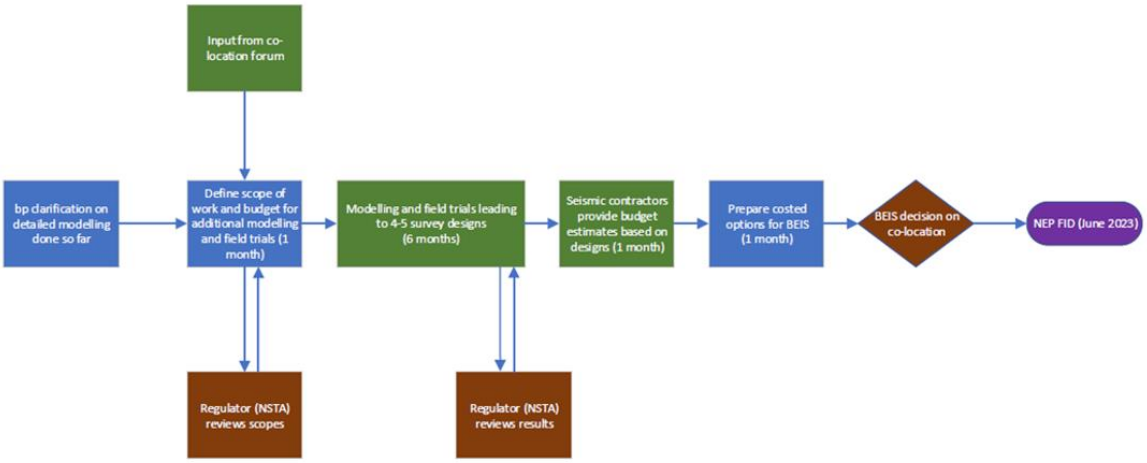
Mr Sewell's timeline for modelling and field studies is unrealistic

8.15 Mr Sewell sets out a flow chart in his Recommendations illustrating "*the process for how investigations could progress to enable a fully informed decision to be made on the feasibility of co-location from a seismic data acquisition perspective*". For ease of reference, we provide Mr Sewell's flow chart below.

8.16 It should be clear from our explanation of the complexity of modelling and field trials that it would be unrealistic even to conduct the necessary modelling and one single field study in the pre-FID period, let alone the pre-modelling field trial and post-modelling repeat field studies over a number of years which would be necessary to obtain the level of certainty which would be required by investors.

8.17 In addition to the general points made above in relation to the time required to undertake meaningful modelling and field trials, we note that the diagram assumes that within one month it would be possible to not only “Define scope of work and budget for additional

modelling and field trials", but to also receive "Input from co-location forum" and for the NSTA to "review scopes". That is entirely unrealistic.



9. OTHER REASONS WHY AN EXCLUSION AREA IS NECESSARY ARE NOT ADDRESSED BY THE SEWELL REPORT OR ORSTED

9.1 Finally, it is important for the ExA to note that the Sewell Report deals only with the question of monitoring.

9.2 It offers no comment or solutions in relation to any of the other substantial problems concerning co-location in the Exclusion Area as identified in bp's Position Statement submitted at Deadline 1 (REP1-057, Appendix 2, section 7(iii), electronic page 129) – specifically the issues identified in relation to:

9.2.1 relief well access;

9.2.2 helicopter access; and

9.2.3 drilling rig access.

9.3 As described in bp's Position Statement submitted at Deadline 1 (REP1-057, Appendix 2, section 8(iii), electronic page 131 (Regulatory Requirements in relation to Relief Wells, Helicopter and Rig Access)) there are regulatory requirements which necessitate uninhibited access to construct relief wells, and corridors for helicopter access and rig access. bp does not consider it would be able to meet the relevant requirements of regulation and expectations of regulators in relation to the NEP project if access were to be hindered by the co-location of a wind farm in the Exclusion Area. The absence of satisfactory answers to these issues, in addition to the points raised by bp in relation to monitoring, mean that an Exclusion Area must be imposed if the NEP project is to be delivered to enable the ECC plan.

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APPENDIX

RESPONSES TO REQUEST FOR ADDITIONAL INFORMATION IN 4.1 OF THE SEWELL REPORT

RESPONSES BY BP TO THE REQUESTS FOR ADDITIONAL INFORMATION SET OUT IN SECTION 4.1 OF THE SEWELL REPORT

Annex 1 of bp's submission to Deadline 5a summarises bp's position (on behalf of NEP) in relation to the conclusion and recommendations set out in the report by Andrew Sewell of Xodus Group Limited ("Sewell Report"). The information in this Appendix to Annex 1 addresses some aspects of the "Request to bp for additional information" set out in Section 4.1 of the Sewell Report (the "Requests"), and bp has set out below the Requests and its specific responses to the Requests. These responses should be read collectively with Annex 1.

QUESTION 1

1. *Ref Section 2.27 of [26] bp's Response to the Jan 2022 OREC/NZTC report, slides 8 and 11 of the OBN workshop pre-read [7], and answer to Q9 in the OBN Q&A document [8]:*

   Has bp undertaken detailed 3D/4D finite difference forward modelling survey design projects for different possible acquisition schemes, including different densities of OBN/OBC vs towed streamer, and with/without wind turbines? If so, please can it provide the reports on this exercise.

BP'S RESPONSE

1.1 The work that bp has undertaken concerning finite difference forward modelling of full wavefields for multiple survey designs for acquiring seismic in an area with wind turbines has shown that:

- numerous operational and logistical challenges exist in terms of carrying out an OBN survey within a windfarm;
- these challenges are particularly acute in terms of using OBN for 4D seismic acquisition for Endurance; and
- given the fact that there has never been an OBN survey conducted within a windfarm and the number and nature of assumptions concerning operational constraints that would need to be made about using OBN at Endurance (examples of which are set out in Section 8 of Annex 1), pre-modelling field trials would need to occur before any meaningful and reliable forward modelling of possible acquisition schemes using OBN at Endurance could occur.

1.2 Pre-modelling fields trials are required in order to provide data and information that is needed to: (i) address numerous uncertainties and difficulties that exist concerning inputs for forward modelling the use of OBN at Endurance; and (ii) inform the modelling assumptions. For example, it is not known how to accurately model the potential extra noise sources (the vibrations of the turbines on the seabed, the backscatter of energy from the infrastructure in the water column (equivalent to multiple episodes of ''rig noise" – P.26-27 OREC report)) or the degree of 'misplacement' of sources and sensors that would occur due to practicalities of operations around infrastructure.

1.3 As explained in Annex 1, modelling is only indicative and illustrative of a likely "best-case" scenario of what is theoretically possible and does not prove operational or real-life feasibility, and once a reliable modelling exercise occurred, there still would need to be extensive post-modelling field trial(s) before it could be

demonstrated that 3D and 4D seismic data of sufficient quality could be acquired at Endurance using OBN or a hybrid of OBN and P-cables and with wind turbines in the Exclusion Area.

1.4 The significant costs and time involved in carrying out pre-modelling field trial(s), undertaking detailed forward modelling of using OBN at Endurance in the presence of wind turbines and conducting post-modelling field trial(s) would not be practical or justified.

QUESTION 2

2. *Ref the same as request 1, and the table in Section 7.0 on page 28 of bp's Technical Assessment [5]:*

Has bp modelled the relative cost vs image quality at different depths for a range of densities of OBN? Please share if available.

BP'S RESPONSE

2.1 For the reasons explained above in bp's response to Request 1, detailed modelling of multiple different OBN survey parameters for seismic acquisition at Endurance has not been done. However, based on bp's extensive experience with and knowledge of OBN and work carried out to date, bp has assessed estimated costs for different densities of OBN.

2.2 As shared with Orsted for purposes of the first workshop held in May 2021, and subsequently presented to the OGA, BEIS and The Crown Estate during a presentation co-ordinated by bp and Orsted and held in June 2021, bp determined that if OBN was used for MMV of the Endurance aquifer, it would (assuming receiver spacing of 200m x 50m) add an estimated £130m over the project life, and if wind turbines were present in the Exclusion Area the seismic acquired by OBN would be poorer data quality than what would be acquired using towed streamers without the obstruction of wind turbines.

2.3 bp subsequently, during an October 2021 presentation provided to Orsted, TCE, BEIS and the NSTA and focussed on OBN, estimated costs at between £260m - £315m, based on assumed receiver spacing of 50x100m and source spacing of 25x25m (reflecting the shallow water depth of ~60 m at the Endurance aquifer).

2.4 The estimated costs prepared in May/June 2021 and October 2021 were based on current pricing and the number of surveys envisaged at the time the estimates were made. The estimated costs will need to be updated to reflect the number of surveys in the MMV plan that forms part of the process whereby the NSTA grants the Endurance store permit.

2.5 Orsted has the presentation documents in question.

2.6 The estimated costs of using OBN depend on a number of factors. These include the number of planned surveys and assumed receiver spacing. Additionally, there are practical considerations that affect both the timing and costs of carrying out a dense OBN survey. For example, a dense array of 100 x 100m nodes would require approximately 25,000 nodes to be deployed, and there are a limited number of nodes available (with a typical vessel and crew currently having ~5,000 nodes available). Additionally, the use of remotely operated vehicles (ROVs) for

placement of nodes around obstructions (e.g. wind turbines) would require deep water crews, and currently there are ~4 such crews operating in the world.

QUESTION 3

3. *Ref slides 6 and 9 of the OBN workshop pre-read [7]:*

Does any survey design work undertaken by bp also model the degree to which differences in acquisition parameters between baseline and repeat surveys impacts the ability to detect fluid differences over time?

BP'S RESPONSE

3.1 Although bp has not, in relation to the Endurance aquifer, modelled the impact of changing survey design on 4D repeatability, bp's extensive global seismic acquisition experience has demonstrated that 4D surveys that do not replicate the acquisition of the original survey do not produce reliable results with sufficiently high confidence that the 4D time-lapse signals due to fluid changes in the reservoir can be identified and quantified appropriately. This is true for both towed streamer, as well as ocean bottom surveys.

3.2 Places where changes have been made to acquisition parameters in a 4D setting have either been put in place to improve source and receiver repeatability or because confidence in the 4D signal has been built over time to such a level that a (usually minor) change in parameters can be tested, with the option to revert back if the results are not as expected. The "back-up to old design" approach would not be an option at Endurance if wind turbines were present in the Exclusion Area.

QUESTION 4

4. *Ref section 2.28.1 of [26] bp's Response to the Jan 2022 OREC/NZTC report:*

bp states that it has investigated in detail the possibility of using a short streamer system such as P-cable for 4D monitoring down to the Bunter reservoir (TVDSS > 1000m) and concluded that it won't be suitable. But has bp modelled how well P-cable can image the near surface (<500m TVDSS) and provide CO2 monitoring for those depths? Please share the results if so.

BP'S RESPONSE

4.1 bp has not modelled P-cable for the 0-500 m shallow section. However, P-cable is not proven for 4D in shallow water and based on the work bp carried out in relation to the potential use of P-cables, if Orsted erected wind turbines in the Exclusion Area, bp estimates that P-cable could only be acquired in swaths ~420 m wide with 380 m gaps along the lines of turbines. The resulting lack of data around the wind turbines would create significant gaps in coverage of the Endurance aquifer, particularly in the shallow section, and means that the coverage provided by using P-cables in the 0-500 m shallow section would be akin to enhanced 2D seismic rather than 3D seismic. This would not provide the confidence in containment or conformance that is required in order to satisfy monitoring requirements. This information was shared with Orsted during the Session 3 workshop held in December 2021. Orsted has the presentation document in question, and also see pages 48-49 of bp's Technical Assessment (submitted as Annex 1 to its Deadline 1 submission, REP1-057, electronic page 194).

4.2 A P-cable survey carried out in open water would (per its design) image the shallow section of the subsurface. However, given the characteristics of the Endurance aquifer and seabed, it would not be appropriate to use P-cable for monitoring the shallow section of the Endurance aquifer (even if wind turbines were not located in the Exclusion Area).

QUESTION 5

5. *Ref section 2.27 of [26] bp's Response to the Jan 2022 OREC/NZTC report:*

bp implies that it has studied combinations of OBN and P-cable as potential hybrid solutions for 4D monitoring to cover the range for depths from seabed to base Bunter as part of its "significant work and assessments undertaken …. during 2019-2021". Is there a report on this work that can be provided that goes into more detail than what has been provided so far in bp's submissions?

BP'S RESPONSE

5.1 bp has studied many options for monitoring (see pages 48-49 of bp's Technical Assessment (Annex 1 to its Deadline 1 submission, REP1-057, electronic page 194)), including the hybrid sparse OBN and P-cable option that was presented by an Orsted consultant, and subsequently investigated in detail by bp. Although there is no written "report" per se, bp's technical conclusion was presented during the Session 3 Workshop held in December 2021 (and Orsted has the presentation document in question). In particular, bp advised that for the Endurance aquifer sparse OBN would not provide the resolution required at reservoir depth, nor would it provide coverage of the shallow overburden (full-waveform inversion (FWI) velocity imaging is not proven for 4D). Additionally, P-cable does not image reservoir depths, and as explained above in response to Request 4, P-cable within wind turbines in the Exclusion Area would have significant gaps in the shallow section due to the 380m wide gaps in the data. Accordingly, bp previously advised Orsted that using a combination of sparse OBN and P-cables would not be a feasible solution for monitoring the Endurance aquifer if there were wind turbines in the Exclusion Area.

QUESTION 6

6. *Ref the answer to Q7 in the OBN Q&A document [8]:*

bp has stated that a dense layout of nodes is not possible in a wind farm. What experience or modelling is this statement based on and can it be shared with us?

BP'S RESPONSE

6.1 bp pioneered the use of OBN for industrial applications and carried out the first major field trial in 2005. It has extensive experience and knowledge concerning OBN, which is typically used at scale for deep oil and gas reservoirs, and for a number of years bp has been involved in work to develop technologies that may improve OBN efficiency and help acquire seismic within windfarms. This includes working on and funding Blue Ocean autonomous nodes. However, such technologies are still in early development, with no certainty of improving data quality or being commercially viable. In the meantime, no OBN survey has ever been conducted within a windfarm and a hybrid of OBN (whether sparse or dense) and P-cables has not been used for 4D monitoring inside or outside of a windfarm.

6.2 In terms of a dense layout of OBN nodes, bp did not state in its answer to Q7 in the OBN Q&A document that "*a dense layout of nodes is not possible in a windfarm*". bp stated that it is not physically possible to use dense OBN ***at all locations in a windfarm*** (emphasis added). For example, bp determined that at Endurance source spacing would need to be about 25m, and with the exclusion zones around the turbines (100m radius for safety for a vessel towing a source) this means that at those locations there would be gaps in the shallow data. Additionally, a dense layout of OBN nodes at Endurance raises various practical challenges and in November 2021 bp advised Orsted that assuming there was no windfarm in the Exclusion Area and 2 node vessels were used, it would take several months to acquire data using a 50 m x 100 m node grid (see answer to FQ4). There would be even more challenges using dense OBN nodes at Endurance if there were wind turbines in the Exclusion Area. Taking account of the safety restrictions that would be needed for working within the windfarm, the limited number of nodes and crews available and other weather and safety downtime for acquisition, bp believes that it is unlikely that carrying out a survey using dense OBN nodes with wind turbines present in the Exclusion Area would be able to be completed in one North Sea season, and bp advised Orsted in November 2021 that if wind turbines were in the Exclusion Area acquisition within a single season was not guaranteed.

QUESTION 7

7. *Ref sections 7.3.1 and 7.3.3 of bp's Technical Assessment [5], slide 7 of the OBN workshop pre-read [7], and the answers to Q9 and FQ7 in the OBN Q&A document [8]:*

Has bp investigated the size/shape of air gun array and source vessel that would be appropriate for the relatively shallow Bunter sandstone target at Endurance? Please share any data on this.

BP'S RESPONSE

7.1 In carrying out a 3D towed streamer acquisition over Endurance during 2022 bp has used a source volume (400 cubic inches) significantly less than typical 3D towed streamer surveys. bp will continue to try to optimise the size/shape of air gun array and source vessel appropriate for the relatively shallow Bunter sandstone target at Endurance, taking account of relevant factors including weather conditions and environmental impacts including the Southern North Sea special area of conservation and minimising impacts on marine mammals, particularly the harbour porpoise.

QUESTION 8

8. *Ref section 10, third paragraph of page 8 of bp's Technical Assessment [5]:*

bp states that only 30% of storage capacity can be used if there are no brine production wells. Is the work that underpins this estimate available for review? The 2016 White Rose reports do not cover this.

BP'S RESPONSE

8.1 Whereas White Rose planned for 54 MT of storage (about 12% of the total storage volume), NEP plans to utilise the full storage capacity of approximately 450 MT of

CO2, which is accessed in two stages progressively. The first stage is reliant on the maximum pressure allowable by the seal rock to contain CO_2 without any brine production. The second stage relies on brine production at the uniform periphery of the store to free up further pore space within the Endurance store, whilst staying within the maximum pressure allowable as a safety limit. NEP's models have shown that the storage capacity for the Endurance store is approximately 150 MT for the first stage and a further approximately 300 MT for the second stage, thus making up the approximately 450 MT total in bp's Technical Assessment. Therefore, without brine production approximately 150 MT or 30% of storage capacity at Endurance can be safely accessed. Further information in this respect was shared in a presentation co-created with Orsted and presented to the NSTA and TCE in June 2021. Orsted has the presentation document in question.

QUESTION 9

9. *Ref section 2.9 of [26] bp's Response to the Jan 2022 OREC/NZTC report:*

bp has stated that the CCS project is now significantly different from when it was White Rose and will require many more CO2 injection wells for example. However it has not made clear how the MMV plan is different from that which is described in the K42 White Rose report for example. Please can bp explain what are the significant changes in MMV plan with regards to surface seismic.

BP'S RESPONSE

9.1 Aspects of the Measurement, Monitoring and Verification (MMV) plan for the White Rose Project described in the K42 document are similar to NEP's current MMV plan. For example, the K42 document (made public in 2016) described the full extent of the complex and identified towed streamer seismic as the primary component of the MMV plan for the Endurance Store.

9.2 However, there are a number of differences between the MMV in the K42 document and NEP's MMV plan, reflecting the fact that a key difference between the White Rose CCS project and NEP is the overall size of the project. Specifically, the White Rose project was based on an injected volume of 54 MT of CO_2, whereas NEP's plan for Endurance has a full-field development of 450 MT when pressure is managed with brine production, and increasing the stored volume involves an increase in monitoring frequency In NEP's MMV plan (see bp's response below to Request 10).

9.3 Another difference with the K42 MMV plan is that NEP currently is not planning to use microseismic monitoring in its base-case MMV plan, as the mobile seabed conditions make the deployment of a seabed array challenging and the cost/benefit is relatively low (it may be hard to detect microseismic scale events above the noise floor). Additionally, tests NEP carried out in November 2020 showed that the repeatability of 2D seismic is poor and therefore NEP has discounted 2D seismic (see page 48 of bp's Technical Assessment submitted as Annex 1 to its Deadline 1 submission).

9.4 Another important difference between the White Rose Project MMV plan as described in the K42 report and NEP's current MMV plan for Endurance is the fact that following review of the 2013 Polarcus seismic data, bp determined that the data are not suitable for use as a baseline. For example, the acquisition

parameters of the Polarcus data mean it is not possible to use shallow water noise-removal techniques on the data. Additionally, the Polarcus data do not have the higher resolution required to be able to detect CO_2 away from the main plume. Accordingly, a new towed streamer 3D acquisition programme designed to optimise imaging at the Endurance store was carried out earlier this year and will be used by NEP to create a new baseline.

QUESTION 10

10. *Ref section 2.9 of [26] bp's Response to the Jan 2022 OREC/NZTC report:*

What schedule of repeat seismic surveys does bp now envisage for Endurance, or is it still the same as in the White Rose plan?

BP'S RESPONSE

10.1 The White Rose Project MMV plan set out in the K42 White Rose report (page 132) indicates that after injection, repeat surveys would occur after 4 years, 8 years, 12 years and 18 years, with one more survey occurring 3 years after cessation of injection. In contrast, NEP currently plans for there to be an initial time-lapse survey 3 years after initial injection and another survey 6 years after injection, followed by further surveys during the injection phase, the timing of which will be based upon the conformance that is observed after injection and the full integrated analysis of all MMV data. NEP's current expectation is that these additional surveys will occur at 5-year intervals (see bp's submission to Deadline 1, REP1-057, electronic page 126). Additionally, two surveys are currently envisaged after the injection phase is completed in order to ensure the stability of the plume. Additional phases of development may trigger revisions to the timing of monitoring surveys.

QUESTION 11

11. *Ref section 2.28.2 of [26] bp's Response to the Jan 2022 OREC/NZTC report:*

bp states that it has carried out seismic rock property modelling of CO2 replacing brine to understand what resolution of seismic data is required for the Endurance store. We have been shown a very brief summary of this. Is there a more detailed report that can be provided?

BP'S RESPONSE

11.1 bp has undertaken multiple stages of seismic rock property modelling to investigate the detectability of CO_2 on seismic. This work has been an iterative process as bp has developed CO_2-specific fluid substitution workflows within its software, and there is no report which describes the entirety of the seismic rock property modelling of CO_2 replacing brine. Additionally, the North Sea Transition Authority and The Crown Estate commissioned Ikon Science to study seismic rock property modelling of CO_2 which is ongoing and this raises some additional parameters for modelling which may reduce detectability at low CO_2 levels. bp is investigating this further.

QUESTION 12

12. *Ref section 2.40 of [26] bp's Response to the Jan 2022 OREC/NZTC report:*

What has bp learnt form the use of OBC and now OBN for 4D imaging at the Valhall field?

BP'S RESPONSE

12.1 Valhall, an oilfield in the Norwegian sector of the North Sea, was operated by bp until 2017 when Aker bp became the operator.

12.2 The main reservoir at Valhall is deep (~2.5 km), and the field originally had a permanent seabed seismic monitoring array (45 sqkm) using trenched ocean bottom cables (OBC) and a much smaller, high-density, ocean bottom cable (OBC) array (0.6 sqkm) used for shallow hazard imaging around the production platform.

12.3 The fixed array linked to dense sampling on the source side resulted in good 4D images of the reservoir and regular (<1yr) 4D contributed to understanding the reservoir. However, the lifetime of the array was overestimated, and maintenance underestimated, and larger array has not been in operation since ~2015 and was replaced by OBN to acquire 4D seismic data.

12.4 For various reasons the use of OBC and OBN at Valhall to acquire seismic data does not assist in determining how to acquire seismic data for Endurance. For example, the fact that the main reservoir at Valhall is at the crest of the structures so much deeper (~2.5 km) than at Endurance (~1 km), means that a relatively coarse line spacing (350 m) of the OBC array is sufficient for time-lapse imaging of the reservoir at Valhall. However, neither a sparse OBC array, nor use of sparse OBN nodes, is suitable for Endurance. Critically, as there is no windfarm over Valhall, it does not have to deal with the numerous challenges of operating a 3D/4D seismic survey in a windfarm and the fact that OBC and OBN have been used successfully at Valhall, an oilfield where acquisition occurs around a platform/production facilities, does not mean that OBC or OBN could be used to acquire seismic within a windfarm.

ANNEX 2

RESPONSE TO ORSTED'S COMMENTS ON BP'S LEGAL SUBMISSIONS

HERBERT SMITH FREEHILLS

Deadline 5a – 4 July 2022

BP'S RESPONSE TO ORSTED'S LEGAL SUBMISSIONS SUBMITTED AT DEADLINE 5

1. OVERVIEW

1.1 As part of their response to Deadline 5, Orsted Hornsea Project Four Limited ("Orsted") included legal submissions prepared by James Maurici QC regarding the lawfulness and appropriateness of bp's proposed disapplication of the Interface Agreement (the "IA") within the protective provisions bp has proposed be included within the Hornsea Project Four DCO (most recently in REP4-059, Appendix 1, paragraph 6, electronic page 10).

1.2 Orsted's legal submissions are divided into the following sections:

1.2.1 the proper legal characterisation of what bp seeks;

1.2.2 the proper interpretation of the scope of s120(3) of the Planning Act 2008 ("PA 2008"); and

1.2.3 why bp's disapplication should not be included in the DCO even assuming there is power to do so.

1.3 The submissions advocate why the provisions proposed by bp should be rejected.

1.4 bp has provided responses to these submissions in the same order below. Whilst bp considers (for the reasons set out further in section 3 below) that it would be legitimate to continue to seek to disapply the IA without providing for any accompanying compensation to Orsted, bp acknowledges the counter submissions made by Orsted and The Crown Estate ("TCE") (including in relation to s135(2) of the PA 2008) and the potential difficulties for the ExA and SoS in considering such competing submissions.

1.5 As such, bp proposes to revise its approach to offer the ExA and, in turn, the SoS a constructive, complete solution to the interface issues between the respective projects. This is in contrast, as explained in section 5 below, to the practical effect of the approach advocated by Orsted within its submissions and accompanying protective provisions.

1.6 bp's revised approach is described in section 6 below; however, to briefly summarise what is now proposed:

1.6.1 rather than seeking to disapply the effect of the IA, the protective provisions would preserve the rights and obligations as exist under the IA, save that they would remove bp's liability to Orsted under it; and

1.6.2 in lieu of such liability, the protective provisions would provide for bp (on behalf of NEP) to make a compensation payment to Orsted.

1.7 bp are considering appropriate drafting to make provision within the DCO for the payment of such compensation, taking account of the various considerations that would be relevant in determining quantum, but will be in a position to address the ExA on these issues in the hearing scheduled to commence later this month. bp intends to submit an updated version of the protective provisions (version 4) at Deadline 6.

1.8 As a result of this revised approach, bp does not consider the terms of s135(2) of the PA 2008 to be engaged as TCE's rights under the IA (as described in their Deadline 5 submission (REP5-123)) will be unaffected.

2. THE PROPER LEGAL CHARACTERISATION OF WHAT BP SEEKS

2.1 Orsted make a number of different submissions under this section, including a number of initial points in the introduction section to which bp repeats and responds below for the ExA's ease of cross-reference.

"First, as set out above, there is agreement between BP and Orsted as to the nature of the IA. It is an agreement that governs their "commercial relationship". It being a commercial agreement it can in the ordinary way be waived or varied by renegotiation and agreement between the parties."

2.2 The theoretical ability to renegotiate the IA is not disputed and indeed bp has been engaged in discussions with Orsted for a considerable period to seek to reach a solution to the interface issues which would, in effect, achieve such variation to the terms to the IA and mirror what bp has proposed to date under their protective provisions. bp will continue to engage with Orsted in an effort to reach an agreed outcome, including in relation to any necessary compensation as a result; however, as explained in previous submissions, there is no certainty that such agreement would be reached between the parties in the necessary timeframe, and particularly prior to the close of the Hornsea Project Four DCO examination, and so it is therefore necessary to provide for a solution within the Hornsea Project Four DCO to apply in circumstances where no commercial resolution is reached.

"*Second, the effect of the provisions sought by BP is to exclude Orsted from the Overlap Zone and also, crucially for these purposes, to deprive them of their contractual rights to compensation in respect of this. Compensation in this regard is something explicitly provided for in the IA. The IA was, of course, freely entered into and has been in force since 2013. BP acceded to the IA as recently as 2021 without any variation of the compensations (or other) provisions. What BP seeks, via the provisions it proposes are included in the DCO, is to wholly circumvent its commercial obligations. Obligations which it freely, and only very recently, took on. It seeks to do so to the detriment of Orsted which is left without either access to the Overlap Zone or any contractual (or other) rights to compensation."*

2.3 There are different elements to this submission, some of which are responded to in more detail in section 3 below (in relation to the deprivation of Orsted's contractual rights under the IA and their entitlement to compensation in relation to the same).

2.4 In terms of the comments noting that the IA was voluntarily entered into and has subsequently been varied and acceded to by bp (most recently February 2021), this again is not disputed; however, the implication appears to be that this precludes bp's proposed approach now. This clearly does not follow and bp has addressed this point in previous submissions (REP2-062, Annex 2, paragraph 4.6, electronic page 18).

2.5 As explained in previous submissions, the IA was entered into at a time when it was considered that co-existence in the entirety of the Overlap Zone would be possible. Following its completion, the relevant parties to the IA met quarterly, until early 2020 when the frequency of the meetings increased to monthly, and fortnightly since Q1 2021 (following bp's accession to the IA, as operator on behalf of NEP) due to increasing project development activity for both the NEP project and Hornsea Project Four. It was through this detailed engagement that bp, in December 2021, shared a technical assessment report (submitted as Annex 1 in bp's Deadline 1 submission, REP1-057, electronic page 146) with Orsted, TCE, BEIS and the Oil and Gas Authority (now known as the North Sea Transition Authority (NSTA)) which summarised NEP's position on the feasibility and limitations of co-existence between the respective projects in the Overlap Zone. As the ExA will be aware, the report concluded that locating wind turbines on top of and near to the Endurance Store would not be feasible. The conclusions of this report were not known, by the White Rose promoters (as the original "Carbon Entity" under the IA) when the agreement was entered into, nor by bp when it acceded to the IA in early 2021.

"Third, despite carrying out extensive legal research, there does not appear to be any precedent, in terms of previous DCOs, to support the inclusion of provisions, the effect of which is described as the disapplication of a private commercial agreement. There is no jurisprudence either which supports this. By their own admission, neither have BP found any precedent (as per their Deadline 2 submission): "We recognise that seeking to disapply a commercial agreement of this sort via provision in a DCO is unusual and possibly unprecedented"."

2.6 Again, this is not disputed; however, the absence of precedent drafting does not preclude new drafting being proposed within the DCO (indeed, it is noted Orsted's Explanatory Memorandum to their DCO explains in para 5.10 that Article 5 of their DCO includes drafting they consider to be not supported by precedent, but necessary in the context of their DCO application (APP-204)). The key is whether there is *vires* to include the provision and, if so, whether it is appropriate to do so in the circumstances. bp considers both components are satisfied in the present circumstances, as elaborated upon in the submission below.

"Fourth, where under the PA 2008 there is provision for the abrogation or modification of existing land agreements, through the compulsory acquisition regime, then this is accompanied by compensation mechanisms to ensure the affected party is compensated for loss of its private rights. In this case, however, BP is seeking to remove all of the Applicant's private contractual rights without the availability of any statutory right to compensation. Indeed, to make matters worse, BP is seeking specifically to remove the rights to compensation which Orsted currently has under the IA."

2.7 As above, whilst bp considers (for the reasons set out further in section 3 below) that it would be legitimate to continue to seek to disapply the IA without providing for any accompanying compensation to Orsted, bp is now proposing to put forward a revised approach within its protective provisions. This will preserve the rights and obligations under the IA, save that it will remove bp's liability to Orsted from under it and instead provide for a compensation payment to be paid to Orsted in order to address the significant adverse public interest impacts which could otherwise arise. This is described in more detail in section 6 below.

3. THE HUMAN RIGHTS ACT 1998 IMPLICATIONS

3.1 As part of their submissions, Orsted allege that the disapplication of the IA would interfere with a possession of Orsted, contrary to Article 1 Protocol 1 ("A1P1") of the European Convention on Human Rights ("ECHR").

3.2 Much of the substance of these submissions will now be addressed (and is largely overtaken) by bp's revised approach to the protective provisions; however, for completeness, bp has set out its position in response to its original submissions below.

3.3 A1P1 provides that:

> *"Every natural or legal person is entitled to the peaceful enjoyment of his possessions. No one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general principles of international law.*
>
> *The preceding provisions shall not, however, in any way impair the right of a State to enforce such laws as it deems necessary to control the use of property in accordance with the general interest or to secure the payment of taxes or other contributions or penalties."*

3.4 Orsted suggest that, in compliance with the obligation in s.3(1) of the Human Rights Act 1998 ("HRA"), the power in s.120(3) of the PA 2008 should be read down to ensure compatibility of the DCO with A1P1 and therefore to prevent the inclusion of provisions which disapply the IA. They further suggest that the Secretary of State may act contrary to s.6(1) of the HRA should he decide to include such provisions in the DCO.

3.5 However, these provisions only take effect if Orsted establishes that it can invoke the A1P1 right.

3.6 For A1P1 to apply to the disapplication of the IA, it must be shown that:

3.6.1 the IA is a *"possession";* and

3.6.2 Orsted was deprived of this possession or its use of it was controlled; and

3.6.3 if deprived, the deprivation was disproportionate to the public interest or, if controlled, the control was disproportionate to the general interest.

3.7 bp's position is, in summary, that:

3.7.1 the IA does not constitute a *"possession"* as it is not freely assignable in the sense articulated in the case law, and does not have a present economic value in its own right;

3.7.2 even if the IA were found to be a *"possession"*, its disapplication (even if considered to be deprivation rather than control) is proportionate to the public interest in facilitating the viability of the East Coast Cluster ("ECC") plan and maximising the capacity for CO_2 storage in the Endurance Store, particularly given the significant importance of the Endurance Store to the UK's wider carbon, net zero and sustainability targets (as detailed in bp's Deadline 1 submission, REP1-057, section 14, electronic page 139); and

3.7.3 Therefore, A1P1 does not apply to the disapplication of the IA and the scope of s.120(3) of the PA 2008 is not subject to any narrowing by operation of s.3(1) HRA.

3.8 These submissions are elaborated on sequentially below, with reference to the relevant case law as appropriate.

Possessions

3.9 Case law, both of the European Court of Human Rights ("ECtHR") and the domestic courts, has confirmed that contracts can be *"possessions"* for the purpose of A1P1 and bp does not seek to challenge that conclusion, on which Orsted's submissions provide significant detail.

3.10 However, this case law clearly shows that not all contracts are *"possessions"* and bp's position is that the nature and provisions of the IA mean that it is of such a character that it cannot be classified as a *"possession".* As Sedley LJ held in ***Murungaru v Home Secretary***[1] (discussed below):

> *"The fact that all possessions can include contracts does not mean that all contracts are possessions"* [30]

3.11 In ***Murungaru***, referenced but not discussed in Orsted's submissions, the Claimant's UK visa was revoked, preventing him from continuing private medical treatment for which he had contracted in the UK. Alongside other grounds, he claimed that the visa decision interfered with the enjoyment of his possessions (his contractual right to receive medical services) in breach of A1P1.

3.12 The Court of Appeal held that Dr Murungaru's contractual right to private medical treatment did not engage A1P1 as it had none of what Lewison J termed the "*indicia of possessions*" [58], these being that a right is tangible, assignable, transmissible, realisable and of present economic value. Lewison J considered the touchstone of whether a contract was a possession for the purposes of A1P1 to be whether the contract can realistically be described as an "asset", on the basis of these indicia.

3.13 In ***Breyer Group plc and others v Department of Energy and Climate Change***[2], the Claimants claimed that the Department's decision to launch a consultation on proposals to cut smaller scale solar photovoltaic feed-in tariffs ("FITs") (a decision which caused orders to be cancelled and projects to be abandoned) breached A1P1 by depriving them of the enjoyment of their possessions, these being the solar installation, supply and generation contracts they had entered into (and some they had yet to execute).

3.14 At first instance, the Court struggled with the concept of "possessions" but concluded that the signed or concluded contracts were "possessions" for the purpose of A1P1. However, Coulson J reached this conclusion by applying Murungaru and its "*indicia of possessions*" assessment. Here, the contracts were largely contracts to procure, install and register solar panel systems in return for either a fee or receipt of monetary FIT payments. They were

[1] [2008] EWCA Civ 1015
[2] [2014] EWHC 2257, affirmed on appeal in [2015] EWCA Civ 408

therefore tangible, assignable and, on their face, had present economic value. The conclusion as regards concluded contracts was not challenged on appeal, where discussion centred on whether a wider category of contracts (including contracts that were contemplated but not executed) were also possessions, which they were held not to be.

3.15 In ***Solaria Energy UK Ltd v Department for Business, Energy and Industrial Strategy***[3], on similar facts to ***Breyer***, the Claimant had entered into a sub-contract to supply solar panels to a company. Solaria claimed that, as a result of the Department's proposal, they were obliged to renegotiate the sub-contract and lower the contractual rate of payment, which they claimed was an interference with their possessions under A1P1.

3.16 At first instance, the Court held that Solaria's sub-contract rights fell short of the ***Murungaru*** criteria. While they had value to Solaria, that value was not readily realisable or marketable because the sub-contract could not be assigned.

3.17 The Court of Appeal acknowledged that *"not all contracts are possessions"*, though noted that *"the starting point must be that a signed and part-performed commercial contract is, prima facie, a possession"* [34]. Here, the Solaria contract was a possession because it was *"of value to Solaria"* and *"had a value in monetary terms without the need for it having first been converted into money"* [34].

3.18 The CoA held that assignability is *"one of many factors which must be applied to test whether a contract was a possession"*, though not being a *"black and white test"* [38] for possessions. This was ultimately of less relevance to the Court's conclusion because it found that the Solaria contract actually could be assigned (just with the counterparty's prior consent).

3.19 The above case law shows a pattern of contracts being found to be *"possessions"* under A1P1 only where they are of a specific character – these are likely to be principally contracts with present economic value, which are assignable and in the nature of an *"asset"* to their holder.

3.20 The IA is not of such a character to any of the parties thereto. On the IA's own terms it is merely a *"mechanism to seek to ensure successful co-existence of wind and carbon storage projects"* and is intended to *"provide a framework within which both the Carbon Entity and the Wind Entity are incentivised to work together"* (clause 2.1). In particular:

3.20.1 The IA is not assignable in the way in which that concept is discussed and employed in the judgments in ***Murungaru***, ***Breyer*** and ***Solaria***. While clause 8 of the IA requires the Wind Entity or Carbon Entity (as defined therein – currently Orsted and bp respectively) to procure that their successors enter into a deed of covenant to perform and observe the obligations contained within the IA, this is exclusively triggered by a transfer of the Carbon or Wind Agreements for Lease ("AFL") or the grant of the Carbon or Wind Leases to a new entity. Indeed, this is the only scenario in which succession makes sense or is practicable. bp could not go out into the marketplace and assign the IA to any willing recipient – the IA is solely designed to regulate the interface and co-existence between the Carbon and Wind projects (further to the terms of their respective AFLs and Leases) and has no wider relevance or value. It would be meaningless to any party other than the beneficiaries of the Carbon and Wind AFLs and Leases.

3.20.2 Further, the IA has nil present economic value. No consideration was exchanged under the IA other than the respective contractual commitments and there are no provisions requiring the exchange of money or items of monetary value, with the exception of the provisions for compensation in the event of a Material Adverse Effect. While a transfer of an AFL or Lease relating to the projects would be expected to attract monetary consideration due to their intrinsic value, a transfer of solely the IA (on a hypothetical basis, given the practical impossibility of this as discussed above) would not, as it has no value of its own accord.

[3] [2019] EWHC 2188 (TCC), overturned on the possessions point on appeal in [2020] EWCA Civ 1625

3.20.3 It may be argued that the possibility of compensation for a Material Adverse Effect under the IA imbues it with present economic value. However, this is not a sound conclusion. A right to compensation under the IA would only arise in circumstances where Orsted claimed a Material Adverse Effect in response to actions taken by bp (e.g. pursuant to clause 3.4 where bp became the Notifying Entity and provided Orsted with details of its proposed infrastructure/programme of activities). bp therefore has effective control over when (and whether at all) a Material Adverse Effect arises. If bp were to only develop the Endurance Store outside of the Overlap Zone, there would be no Material Adverse Effect on Orsted and no right to compensation. The IA is therefore of no present economic value because bp controls whether any compensation will ever arise pursuant to it.

3.21 For all the above reasons, bp submits the IA is not a *"possession"* under A1P1 and A1P1 does not have any bearing on its disapplication. The Secretary of State therefore has the power pursuant to s. 120(3) of the PA 2008 to provide for bp's protective provisions in the DCO, even without compensation (notwithstanding the revised approach to its protective provisions put forward in this submission).

Interference and justification

3.22 In the event that the position in the above paragraphs and the conclusions set out in paragraph 3.20 were not accepted and the IA was considered to be a *"possession"*, Orsted would still need to show that bp's protective provisions (i) deprived Orsted of this possession or controlled Orsted's use of it and that (ii) this deprivation or control was disproportionate to the public interest or general interest (respectively).

3.23 In *Lithgow & Others v UK*[4], the ECtHR held that a fair balance has to be struck between the demands of the public interest of the community and the protection of the individual's fundamental rights.

3.24 It is not conceded that disapplication of the IA by bp's proposed protective provisions amounts to deprivation, and Orsted would need to prove this to establish an A1P1 right. However, adopting this as an assumption, and thereby addressing the most stringent requirements imposed by A1P1, such deprivation remains justifiable in the public interest given the exceptional present circumstances.

3.25 In circumstances where the risk of significant compensation under the IA remained extant, it is likely that NEP would elect not to propose utilising the part of the Endurance Store within the Exclusion Area so as to avoid the potential for Orsted to allege that a 'Material Adverse Effect' existed and seek to be awarded such significant compensation. This would limit the Endurance Store to approximately 30% of its capacity, so rendering the ECC plan unviable and would represent a reduction of 10-11MTPA of CO_2 storage capacity, equivalent to greater than 50% of the Government's minimum CCUS capacity target for 2030.

3.26 It is submitted that the public interest in preventing this potential outcome, and the resultant significant hindrance to the Government's wider net zero and sustainability objectives, would render the disapplication of the IA without compensation proportionate. However, as explained above, bp is now proposing to adjust its protective provisions to provide comfort to the ExA/SoS on this point by no longer seeking to disapply the effect of the IA, but rather remove bp's liability from under it and instead provide for bp (on behalf of NEP) to make a compensation payment to Orsted.

3.27 As explained above, bp will put forward an appropriate compensation provision in updated protective provisions at Deadline 6. This will include consideration as to the basis for determining an appropriate and proportionate quantum of compensation, having regard to the public interest considerations underlying bp's proposed protective provisions. bp has provided some initial submissions as to the issue of the quantum of compensation in the context of A1P1 below.

[4] [1986] 8 EHRR 329

3.28 In the seminal case of *Lithgow & Oths v UK*, the applicants had certain of their aircraft and shipbuilding interests nationalised under a new statutory scheme. They claimed that the compensation they received under this scheme was (i) grossly inadequate, as it only represented a fraction of the property's value, and (ii) arbitrary, because it bore no relationship to that value. They therefore claimed a breach of A1P1.

3.29 The ECtHR outlined some key principles on the matter of quantum of compensation:

3.29.1 Firstly, compensation need not be full market value where there are countervailing objectives of public interest. The ECtHR held that *"Article 1 does not, however, guarantee a right to full compensation in all circumstances, since legitimate objectives of 'public interest', such as pursued in measures of economic reform or measures designed to achieve greater social justice, may call for less than reimbursement of the full market value"* [121]. Similarly, in *Scordino v Italy*[5], it was suggested that less than reimbursement of the market value is justified if the appropriation is carried out *"as part of a process of economic, social or political reform"* or *"linked to any other specific circumstances"* [102].

3.29.2 The required compensation varies depending on (i) the nature of the property being taken and (ii) the circumstances of the taking. The ECtHR held that *"Both the nature of the property taken and the circumstances of the taking in these two categories of cases give rise to different considerations which may legitimately be taken into account in determining a fair balance between the public interest and the private interests concerned"* [121]. In *Lithgow*, the assets being nationalised were shares in ship and aircraft-building companies, assets which are far-removed from the nature of the *"possession"* of the IA (if found to be a possession contrary to bp's position described above). It is appropriate that the distinct nature of the IA as compared to the usual, more tangible, assets subject to the ECtHR case law should be factored into consideration of the quantum of compensation and would, if necessary, support a conclusion that an amount less than market value could be awarded if found necessary in the public interest.

3.29.3 The state decision-maker is to be given a wide margin of appreciation. The ECtHR in *James v UK*[6] held that *"the Court's power of review is limited to ascertaining whether the choice of compensation terms falls outside the State's wide margin of appreciation in this domain"* [54]. Given any compensation provision included in the final DCO would have been scrutinised by the Secretary of State, it is likely that any court, European or domestic, should show significant deference to this reasoned and considered conclusion.

3.30 Those principles will be reflected in the provision for the payment of compensation in bp's revised protective provisions.

4. THE PROPER INTERPRETATION OF THE SCOPE OF S120(3) OF THE PA 2008

4.1 bp does not consider that any of the arguments made by Orsted in this section of their submission meaningfully rebut the justifications put forward by bp previously as to the lawfulness of its protective provisions (REP2-062, Annex 2, paragraphs 4.2 to 4.4, electronic page 18).

4.2 Both the previous drafting and the new construct proposed in relation to the IA (described in section 6 below) are, as a matter of law, clearly within the *vires* of the Secretary of State's powers under section 120(3) of the PA 2008, which authorises the Secretary of State to include any provision "*relating to, or matters ancillary to, the development for which consent is granted*". The impact of an agreement which governs the relationship between Hornsea Project Four and the Endurance Store is clearly related to the proposed DCO development.

4.3 Notwithstanding the breadth of the wording, Orsted suggest that s120(3) should be interpreted narrowly so as not to authorise the disapplication of their contractual rights

[5] (2007) 45 E.H.R.R. 7
[6] [1986] ECHR 2

without compensation in suggested breach of their A1P1 rights (para 48 of their submissions). bp has responded to the human rights submissions in section 3 above and consider that the revised approach put forward in this response so as to provide for the payment of proportionate compensation provides a complete answer to Orsted's submissions about 'reading down' s120(3) of the PA 2008.

5. WHY BP'S DISAPPLICATION SHOULD NOT BE INCLUDED IN THE DCO EVEN ASSUMING THERE IS A POWER TO DO SO

5.1 Orsted's submissions contend that disapplying the IA would not be appropriate, even assuming there was *vires* to do so, for the following reasons:

5.1.1 what is proposed is wholly unprecedented;

5.1.2 it is contrary to public policy to interfere with an existing commercial relationship in the way proposed;

5.1.3 because the effect of the provisions would be to deprive Orsted of its contractual rights, rights which are a "*possession*" for A1P1 purposes, there is a requirement for bp to establish that it would be in the public interest and it has not done so; and

5.1.4 the Crown Estate's consent would be required and has not been obtained.

5.2 bp has responded to the substance of most of these submissions in the text above already. However, before explaining the revised approach bp proposes to put forward in the protective provisions, and principally the proposed payment of a specified compensation figure in lieu of liability under the IA, bp also wishes to juxtapose the positions and solutions being advocated by Orsted and bp in this examination.

5.3 Setting aside, temporarily, the merits of the technical submissions put forward by both parties regarding the interface between their respective projects in the "Overlap Zone" (as previously described) and the ability for both to co-exist with one another, it is clear there is an existing issue. The disagreement revolves around the feasibility of a solution coming forward to such issue, its timescales and the consequences of the same. bp's proposed approach offers a constructive, composite solution to the interface issues in circumstances where the SoS agrees with bp's assessment of the technical issues; Orsted's approach offers no such solution, only a further delay and no clear means by which a solution could be reached. This is elaborated upon further below.

bp's approach

5.4 In summary, bp's position is that co-existence is not possible, and will not be possible in the foreseeable future, for the various reasons reiterated in Annex 1 of its response to Deadline 5a. In consequence of this, it has advocated for (and included within its protective provisions) the need for an Exclusion Area within the Overlap Zone, within which Hornsea Project Four cannot be constructed.

5.5 bp has further explained, however, that the inclusion of the Exclusion Area by itself is insufficient to safeguard the deliverability of the full extent of the Endurance Store and so preserve the viability of the ECC plan. In its Deadline 5 submission (REP5-091, paragraphs 3.12 to 3.21, electronic page 3), bp explained how the existence of the IA could give rise to a significant potential compensation liability – the potential for which, would in all likelihood, mean that NEP would not elect to utilise the part of the Endurance Store within the Exclusion Area. This would in turn then prevent the full development of the Endurance Store, delivery of the ECC plan and realisation of the important public benefits of ensuring delivery of the same (as set out above).

5.6 As such, to remove this risk, bp previously proposed to disapply the IA.

5.7 The alternative approach now proposed by bp achieves the same basic objective so as to protect the public interest, by removing the scope for liability to be claimed by Orsted from bp under the IA, but instead providing for a specific payment to be paid to them in lieu of the same.

5.8 The inclusion of both the Exclusion Area and provision addressing the risk of a significant compensation claim from being triggered under the IA would collectively preserve both the deliverability and viability of the full extent of the Endurance Store and, by consequence, the ECC plan and their associated public interest benefits.

5.9 In circumstances where the Secretary of State was satisfied by the technical arguments put forward by bp as to the need to preserve the viability of the full extent of the Endurance Store by precluding wind turbines from being constructed in the area, then bp's protective provisions provide a complete solution to achieve this, and it is lawful for the Secretary of State to impose them based on the public interest arguments set out in this submission and elsewhere by bp.

Orsted's approach

5.10 Conversely, Orsted's protective provisions and position adopted in the examination do not constructively engage with the issues at hand, nor offer workable solutions in practice.

5.11 bp has previously commented on Orsted's draft protective provisions (REP2-062, section 6, electronic page 9) and note that Orsted proposed an updated version as part of their Deadline 5 submission (REP5-075, electronic page 50).

5.12 bp has explained the practical limitations and ineffectiveness of the updates to these provisions in section 7 of Annex 1 to its Deadline 5a response, and specifically their failure to protect the NEP project, or give the SoS the opportunity to provide for an Exclusion Area at a later date should it be shown that one is required via the '*evaluation'* process stipulated by those provisions.

5.13 Further and as fundamentally, Orsted's provisions do not deal with the question of scheme viability in circumstances where the SoS is minded to agree with bp's technical submissions and the need for the Exclusion Area. Under Osted's proposed protective provisions, the IA remains extant with no limitation on the liability that could be claimed under it. bp has explained above why this would, in all likelihood, result in NEP electing not to utilise the part of the Endurance Store within the Exclusion Area, so rendering the ECC plan unviable and ensuring the corresponding loss to the UK's CCUS targets outlined above. Orsted's protective provisions make no attempt whatsoever to address this issue.

5.14 As a result, in circumstances where the SoS were persuaded by bp's technical submissions and the public benefit interest in preserving the full extent of the Endurance Store, he would not have the ability to safeguard its delivery under Orsted's protective provisions. They are therefore fundamentally flawed and incapable of addressing the important public interest considerations raised by bp's representations.

6. REVISED APPROACH UNDER BP'S PROTECTIVE PROVISIONS

6.1 As bp has set out above, whilst in principle it would be legitimate to maintain the approach advocated in its previous version of the protective provisions to disapply the effect of the IA without providing for any accompanying compensation to Orsted, bp is prepared to adjust the drafting to address the submissions made by Orsted and TCE in response. bp's protective provisions would provide the ExA, and in turn, the SoS with an effective, fair and proportionate solution to the interface issues.

6.2 Under the revised approach, rather than seeking to disapply the effect of the IA, bp proposes that the protective provisions would confirm that they do not affect any rights or obligations under the IA, but would instead stipulate that bp would have no liability to Orsted under its terms.

6.3 The anticipated drafting of such provision (to be inserted in place of the existing drafting under bp's protective provisions which presently disapply the effect of the IA (see para 6 of bp's protective provisions (version 3), REP4-059, Appendix 1, electronic page 10)) is set out below:

"*Nothing in this Part of this Schedule shall affect any rights or obligations as exist under the terms of the Interface Agreement, save that the Carbon Entity shall have no liability to the*

Wind Entity under that agreement due to the imposition of the provisions of this Part of this Schedule or its impact upon the authorised project and no claim may be made by, nor award granted to, the Wind Entity for any damages as a result of any alleged antecedent breach of the Interface Agreement prior to the date of this Order."

6.4 In place of the potential for liability to accrue under its terms, it is intended that the protective provisions would provide for bp (on behalf of NEP) to make a compensation payment to Orsted upon a specified trigger. bp are considering how best to frame such a provision in the drafting in order to reflect and address the various considerations that would be relevant in determining quantum, but will be in a position to address the ExA on these issues in the hearing scheduled to commence later this month and would then intend to submit an updated version of the protective provisions (version 4) at Deadline 6.

6.5 As part of this further consideration, bp will also take into account how such payment links to the inclusion of a 'Longstop Date' within the provisions (previously included on a 'without prejudice' basis within version 3 of bp's protective provision, REP4-059, Appendix 1, electronic page 8) and in view of Orsted's comments on the relevance of such a trigger to their project programme.

7. SECTION 135(2) OF THE PA 2008

7.1 Finally, in view of the proposed revisions to its protective provisions and the express confirmation that none of the rights or obligations under the IA are affected (save for the removal of bp's liability to Orsted under it), bp does not consider the terms of s135(2) of the PA 2008 to be engaged as TCE's rights under the IA (as described in their Deadline 5 submission (REP5-123)) will be unaffected.

Appendix C

THE NET ZERO TEESIDE PROJECT DCO

REFERENCE: EN010103

NOTE ON BEHALF OF ORSTED HORNSEA PROJECT FOUR LIMITED

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1. This note is provided to the Examining Authority on behalf of Orsted Hornsea Project Four Limited ("**Orsted**") which is registered as an interested party in relation to the Examination of the DCO application for the Net Zero Teeside Project ("**the NZT Project").** The NZT project is being promoted by a consortium including BP Exploration Operating Company Limited's ("**BP**"). Orsted has made an application for a DCO in respect of the Hornsea Project Four Offshore Wind Farm (ref: EN010098), which is currently in Examination (**"the Hornsea Project"**).

2. The DCO for the NZT Project seeks consent for, inter alia, "*the onshore section of a CO2 transport pipeline for the onward transport of the captured CO2 to a suitable offshore geological storage site in the North Sea*". The NZT Project will connect with BP's Northern Endurance Partnership Project ("**the Endurance Project**") via this pipeline. The seabed interests of the Endurance Project and the Hornsea Project granted by The Crown Estate overlap (**"the Overlap Zone"**).

3. The NZT Project applicant's oral summary of Issue Specific Hearing 1, included "Appendix 7 - Outline of options for the SoS on Orsted Hornsea Project 4 and implications for deliverability of this project". The points made included the following:
    a. The Hornsea Project DCO Examination is considering in detail the competing legal and competing technical arguments as to whether co-existence of the Endurance Project and Hornsea Project is possible within the Overlap Zone. And, that Examination is also considering the nature of the provisions which should be included in the Hornsea Project DCO in order to address issues in relation to the overlap;
    b. Re-litigating these issues during the Examination for the NZT Project DCO would not be sensible, as the recommendation to be made by the relevant Examining Authority in the Hornsea Project DCO Examination will ultimately be provided to

the same decision maker (the Secretary of State for Business, Energy & Industrial Strategy) prior to that decision maker receiving a recommendation in respect of the NZT Project;

c. The NZT Project DCO does not extend to the Overlap Zone. It has, therefore, no direct physical conflict with the Hornsea Project. In contrast, the Hornsea Project DCO application does seek authorisation of development in the Overlap Zone;

d. Notwithstanding the above matters, the applicant for NZT Project DCO will seek the inclusion of an Article in the DCO, to address liabilities which could in certain circumstances otherwise arise under the Interface Agreement (**"IA**"). The IA governs, and has done since 2013, the interface between the Hornsea Project and the Endurance Project in the Overlap Zone. The proposed Article will be included in the NZT Project applicant's draft DCO to be submitted at Deadline 2. What is proposed, it is understood, is as follows "*Disapplication of Interface Agreement - From the date of this Order, the Interface Agreement shall no longer have effect, and no claim may be made, nor award granted, for any damages as a result of any alleged antecedent breach of the Interface Agreement prior to the date of this Order*".

e. Reference is made by the NZT Project applicant to submissions made by BP to the Hornsea Project DCO Examination, in which they expressed concern that there may be an antecedent breach of the IA unless it is disapplied.

f. The NZT Project applicant has requested that the scrutiny of/advocacy for its proposed disapplication of the IA is limited to the Hornsea Project DCO Examination, so limiting duplication of time/resource in the NZT Project DCO Examination.

4. So, in the context of the NZT Project DCO the applicant is seeking the disapplication of the IA by including an article for that purpose in the DCO. The effect of this, if included, is the same or at least similar to what BP are seeking by way of protective provisions in the context of the Hornsea Project DCO. The suggestion is that any and all legal argument in relation to the disapplication of the IA take place in the context of the Hornsea Project DCO. The purported justification for this is that both DCOs will be determined by the same decision maker and that the Hornsea Project will be determined first. The latter point is not accepted as the exact determination timescales or order cannot be known at this stage.

5. That said Orsted understands the desire to limit the costs wasted arguing the same matters twice in two DCO applications that will be determined the same decision-maker. Accordingly, Orsted attaches to this note its legal submissions in relation to the proposed disapplication of the IA in the context of the Hornsea Project DCO Examination. These submissions set out why such disapplication would neither be lawful nor appropriate. Those submissions apply also to what is proposed in the context of the NZT Project DCO. The Examining Authority is asked to consider those legal submissions to the extent it considers that the disapplication of the IA is something it must deal with in the context of this DCO application.

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Thursday, 09 June 2022

HORNSEA PROJECT FOUR OFFSHORE WIND FARM

ORSTED HORNSEA PROJECT FOUR LIMITED

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES 2010 (AS AMENDED) – RULE 17 (REF: EN010098)

APPLICANT'S LEGAL SUBMISSIONS

Introduction

1. These are the submissions of Orsted Hornsea Project Four Limited ("**Orsted**") in response to BP Exploration Operating Company Limited's ("**BP**") response to Deadline 4, and the Examining Authority's request for information made by letter dated 14 April 2022 pursuant to Rule 17 of The Infrastructure Planning (Examination Procedure) Rules 2010 (as amended) and addressed to Orsted and BP.

2. These submissions deal with the issue of whether it is lawful, and if so, appropriate, to include in the Development Consent Order ("**DCO**") for the Hornsea Four Offshore Wind Farm ("**the Hornsea Project**") certain protective provisions proposed by BP. The effect of these provisions is to (to use BP's language) "disapply" a commercial agreement, namely the Interface Agreement ("**the IA**"). This governs, and has done since 2013, the interface between the Hornsea Project and the Northern Endurance Partnership Project ("**the Endurance Project**", sometimes referred to in the documents as "**the NEP**") in an overlapping area of seabed referred to as the "**Overlap Zone**".

3. At the outset it should be noted that the effect of what BP asks the Secretary of State to include in the DCO is two-fold: (i) to exclude the Hornsea Project from the Overlap Zone; and (ii) to "*disapply*" the terms of a commercial agreement under which Orsted would be entitled to compensation in relation to this exclusion.

4. Using provisions in a DCO to "*disapply*" a commercial agreement is wholly unprecedented. Moreover, while the language used by BP is "*disapply*" what is actually sought by BP is to deprive Orsted of the benefits of a commercial agreement that was freely entered into by the parties and indeed acceded to by BP (without amendment) as recently as 2021. Thus, Orsted's valuable contractual rights in the IA would be abrogated.

Where precedent does exist under the Planning Act 2008 ("**the PA 2008**") for the overriding or modification of existing land agreements, through the compulsory acquisition regime, then this is accompanied by compensation mechanisms to ensure the affected party is compensated for loss of its private rights. In this case, BP is seeking to remove the Applicant's private contractual rights without there being any compensation provided for under the PA 2008. This is made more egregious by the fact that BP is seeking specifically to remove existing rights to compensation which Orsted has under the IA.

The background

(i) The IA

5. The IA is dated 14 February 2013. It was entered into by: (i) the Crown Estate Commissioners, (ii) National Grid Twenty Nine Limited and (iii) Smart Wind Limited. Under the IA these parties are referred to as "**the Commissioners**", "**the Carbon Entity**" and "**the Wind Entity**" respectively. The IA in the recitals rehearses that:
   i. the Commissioners have entered into a zone development agreement ("**ZDA**") with the Wind Entity in respect of an area defined as "**Zone 4**";
   ii. the Commissioners have also entered into "**the Carbon AfL**" (defined as an agreement for lease of the Overlap Zone (with other areas)) with the Carbon entity in respect of an area defined as the "**Lease Option Area**";
   iii. "*As Zone 4 and the Lease Option Area overlap, the Parties have entered into this Agreement to regulate and co-ordinate their activities within the Overlap Zone with a view to managing potential conflicts and resolving actual conflicts*".

6. The IA has, as already been noted, been in place since 2013.

7. The IA was varied by a Deed of Adherence and Variation in 2016.

8. Moreover, it was subject to a subsequent Deed of Covenant and Adherence dated 10 February 2021, the effect of which was that from that date onwards BP as "*the Incoming Party*" agreed and covenanted "*with the Continuing Parties that it will perform and observe the future Obligations of the Outgoing Party under the Interface Agreement arising on after the Effective Date [10 February 2021] and be bound by the terms of the Interface Agreement in every way as if the Incoming Party had at all times with effect from and including the Effective Date been party to the Interface Agreement in place of the Outgoing Party.*" In effect, BP became "*the Carbon Entity*" under the IA. Orsted and the Commissioners were defined in the Deed and

Covenant of Adherence as "*Continuing Parties*". So, following the Deed of Covenant and Adherence, BP is "*the Carbon Entity*" and Orsted is "the *Wind Entity*" under the IA. As already noted there was no variation of any of the relevant terms of the IA upon BP's accession in 2021.

9. It is important to understand that the IA is an agreement, a contract, of a commercial nature. In the joint position statement between Orsted and BP (dated 8 March 2022) it is recorded in terms at para 2.1.1.1 that the IA governs the "*commercial relationship*" between Orsted and BP.

10. The purpose of the IA is set out in clause 2.1. Thus it is said:
    i. to provide "*a mechanism to seek to ensure successful co-existence*" in the Overlap Zone "*and to provide sufficient certainty to the Entities to be able to plan and implement their respective projects*";
    ii. to be "*intended to provide a framework within which both the Carbon Entity and the Wind entity are incentivised to work together and to plan their activities to give each other sufficient certainty to progress their respective projects*".

11. The provisions of the IA include:
    i. Requirements that the parties act in good faith (see e.g. clauses 2.1 and 2.3), consult each other (clause 2.2) and do not object to each other's applications for the necessary consents;
    ii. Compensation provisions should there be a material adverse effect on any project as a result of the other;
    iii. An acknowledgement that the rights of the Entities under their agreements with the Commissioners are subject to the IA; and
    iv. An acknowledgement that the Entities do not have any recourse against the Commissioners as a result of the operation of the IA.

12. The Commercial nature of the IA is further underlined by clause 2.5 which provides that "*where the Entities have reached a commercial agreement in relation to any changes to either of their respective Activities pursuant to this Agreement and/or any compensation that may be payable, the terms of such commercial agreement will be documented in writing …*".

(ii) BP's position

13. Having acceded to the IA in 2021, without varying its terms, BP says it is now of the view that the Hornsea Project and the Endurance Project cannot co-exist in the Overlap Zone. Therefore, BP have proposed protective provisions that exclude Orsted from the Overlap Zone and also disapply the IA. Orsted maintains that co-existence is possible. However, for present purposes that is not the material issue.

14. In BP's position statement submitted for Deadline 1, it contended:

> **"15. JUSTIFICATION FOR PROPOSED DISAPPLICATION OF THE INTERFACE AGREEMENT IN THE PROTECTIVE PROVISIONS**
>
> **(i) History and purpose of the Interface Agreement**
>
> …
>
> 15.2 The IA was intended to regulate how the respective projects would interact and co-exist with one another in the Overlap Zone. It was originally put in place during the pre-feasibility stage of both developments, when it was considered that co-existence in the Overlap Zone would be possible. For the reasons set out earlier, this is no longer the case. Following detailed technical work, bp's position is now that co-existence in the Exclusion Area is not possible if the NEP project is to be delivered to meet the ECC plan.
>
> 15.3 In circumstances where it is possible for only one project to proceed in the Exclusion Area, the terms of the IA create the risk of significant financial liability being incurred by Orsted or bp.
>
> 15.4 The financing model for NEP (discussed in Section 9 above) means that NEP will have limited ability to cover additional exceptional costs (as would apply to such a compensation payment) …. If the scale of such compensation payments were large it could render the project uneconomic. Certainly some of the project value losses that Orsted in discussions with bp has suggested might arise in respect of Hornsea 4 if the Exclusion Area were undevelopable for the Hornsea 4 project would render NEP unviable …
>
> 15.5 In summary, the IA is not appropriate in view of the present day reality, and its terms are now adverse to the public interest in the successful delivery of Government policy …
>
> **(ii) Why disapplication of the IA via protective provision is necessary rather than commercial negotiation of a replacement agreement**
>
> …
>
> 15.7 It has now, however, become clear to bp through the results reported in the bp Technical Assessment report (Annex 1) that co-existence within the Exclusion Area is impossible.
>
> 15.8 It is also clear that the risks presented by the IA for the NEP project (and delivery of the UK's decarbonisation policy) are too high to bear, and urgently need to be resolved in the public interest.
>
> 15.9 It is for this reason that bp is requesting protective provisions which would disapply the IA. This approach, of disapplying the IA and replacing those of its provisions which remain relevant and appropriate with suitable protective provisions, gives the Secretary of State the power to grant a DCO for Hornsea 4 which enables both projects to be delivered viably side-by-side.
>
> 15.10 This approach affords Orsted, bp, the ExA, and any other Interested Parties the opportunity to work together through the course of the DCO examination to make any changes

or additions to the draft protective provisions which are considered necessary to strike a balance between the needs of the two projects in the context of the wider Government policy, and the desirability that both projects are facilitated.

15.11 Whilst the disapplication of an agreement between parties under a DCO is novel, Section 120(3) of the Planning Act 2008 enables the Secretary of State to include any provision "relating to, or matters ancillary to, the development for which consent is granted" and so the ability to do is clear and fully justified in these unique circumstances.

(iii) The need to protect against liability for antecedent breach

15.12 bp's proposed protective provisions would also prevent the parties to the IA claiming for antecedent breach of the IA, following the coming into force of the Hornsea 4 DCO and the disapplication of the IA. This provision is important because should the DCO be granted with provisions which prevent Orsted from developing Hornsea 4 infrastructure in the Exclusion Zone, there is a risk that Orsted could take action against bp under the terms of the IA for bp seeking and obtaining such provisions (at a time when the IA existed and therefore was actionable, before its disapplication by the DCO). Therefore, should the Secretary of State be minded to disapply the IA via the protective provisions, it is important that its disapplication goes hand in hand with a provision which prevents action for antecedent breach. Without such a provision, there is a risk that bp's action in successfully putting forward protective provisions which restrict the Hornsea 4 project could give rise to significant liability for the NEP project. There is a risk that such liability could render the NEP project unviable, as part of the ECC plan. This risk would certainly deter essential investment in the project.

(iv) No adverse impact on The Crown Estate of disapplying the IA

15.13 Besides Orsted and bp, the other party bound by the IA is TCE. We do not consider there is any adverse impact on TCE through the disapplication of the IA given the limited nature of the provisions relevant to TCE in the IA.

…"

15. There are several points to note about what is proposed by BP in the context of the DCO:

    i. The legal basis for what it proposes is said to be s. 120(3) of the PA 2008;

    ii. The purpose, and effect, of what is proposed is not just to exclude Orsted from the Overlap Zone but to deprive Orsted of all of its rights to compensation for this under the terms of a commercial agreement that BP itself acceded to in 2021 and agreed and covenanted to perform in full;

    iii. BP accepts, as it must, that what it seeks could instead be achieved by commercial renegotiation of a replacement for the IA. The IA is not special in this regard. Like any other agreement between two commercial organisations, it can be renegotiated.

16. In the Applicant's position statement submitted for Deadline 1 it is said (see para. 7.2):

"bp's proposed protective provisions also seek to disapply the Interface Agreement. This would constitute an abuse of process and as a matter of law would be ineffective. Protective provisions cannot have legal effect such than one party can unilaterally set aside a contract it no longer likes, without the consent of the other parties to that contract. It would not be appropriate for the Secretary of State to interfere with that private contract, which has managed

the relationship of the parties to it since 2013. If any amendments to the Interface Agreement were deemed to be required, the appropriate and lawful course of action would be for bp, the Applicant and The Crown Estate to negotiate a deed of variation to the Interface Agreement. Bp's rationale for disapplying the Interface Agreement is that it is necessary in the public interest to remove the risk that the terms of the agreement lead to award of compensation to the Applicant in relation to an adverse impact of the NEP Project on Hornsea 4 which renders the NEP project unviable. In response to that: (i) this potential liability has been known to those promoting the NEP Project since 2013, and bp entered into the Interface Agreement cognoscente of it, therefore it is a potential liability that should have been factored into the financial modelling of the NEP Project and to have progressed this far suggests the liability would not render the NEP Project unviable; (ii) to the extent (if any) that there is public interest in this matter as bp suggests, it applies at least equally in respect of the public interest in not allowing a nascent technology to curtail the generation capacity of offshore wind and undermine the path to Net Zero; (iii) bp has failed to justify the lawful basis for the disapplication of the Interface Agreement; and (iv) it appears that bp has not sought the views of TCE on this matter. The Applicant's position remains that financial compensation is needed to facilitate coexistence and the parties' rights and obligations under the Interface Agreement should be left unfettered.. The Interface Agreement is not contrary to policy and is simply a mechanism to facilitate coexistence. Contrast the approach taken by bp with the reasonable approach taken by the Applicant whose protective provisions are without prejudice to the rights or obligations of all the parties under the terms of the Interface Agreement."

17. Herbert Smith Freehills ("**HSF**") on behalf of BP responded to the Applicant's Deadline 1 submissions in its Deadline 2 submission at para. 7.9 and annex 2. It should be noted that at para 1.2 it is clearly acknowledged that what BP seeks is not just that Orsted be excluded from the Overlap Zone but also, and crucially for these purposes, that the DCO include provisions that "*disapply a commercial agreement which is currently binding on bp, Orsted and the Crown Estate (the "Interface Agreement"); and (ii) provide that no claims for antecedent breach may be brought in respect of the Interface Agreement ...*". The relevant extract of the BP proposed protective provisions is then set out: "***Interface Agreement*** *6. From the date of this Order, the Interface Agreement shall no longer have effect, and no claim for any damages may be made as a result of any alleged antecedent breach of the Interface Agreement prior to the date of this Order.*"

18. The HSF response in so far as it goes to matters related to the legal basis and justification for what BP proposes states as follows:

"Legal basis and justification

4.2 We recognise that seeking to disapply a commercial agreement of this sort via provision in a DCO is unusual and possibly unprecedented. However, as a matter of law it is clearly within the vires of the Secretary of State's powers under Section 120(3) of the Planning Act 2008, which authorises the Secretary of State to include any provision "relating to, or matters ancillary to, the development for which consent is granted". The existence and impact of an agreement which governs the relationship between the proposed Hornsea 4 Project and another project which forms a key part of the Government's energy and climate policy (the NEP project) is clearly in principle a matter which is related to the proposed DCO development.

> 4.3 It is therefore not a question of vires, but of bp successfully persuading the Secretary of State that such disapplication is justified in the unique circumstances of this case. That justification, as provided at Deadline 1 and summarised above, essentially relates to the risk that the existence of IA (and its compensation provisions in particular) could render the NEP project unviable.
>
> 4.4 This is clearly a 'material consideration' for the Secretary of State in planning terms when determining the Hornsea 4 DCO. It may be that when weighing up the impact on the NEP project against the arguments made by Orsted in relation to the impact on Hornsea 4, the Secretary of State decides (i) not to prevent Hornsea 4 infrastructure within the Exclusion Area (in which case the disapplication of the IA is not needed), or (ii) to prevent the delivery of Hornsea 4 in the Exclusion Area but not to disapply the IA. However, given the importance of the NEP project from a policy and public interest perspective, it is essential that the Secretary of State is aware that he has the option, by virtue of s120(3) of the Planning Act 2008, to disapply the IA should he consider this justified to avoid the risks to the NEP project.
>
> 4.5 In principle, of course, the parties to the IA could agree to set it aside and replace it with an alternative commercial agreement which did not jeopardise the viability of either project. Orsted and bp are seeking to find resolution to the issue and a mutually acceptable outcome through the ongoing commercial discussions. However, there is no certainty that agreement will be reached between the parties in the necessary timeframe. It is therefore vital that the ExA engages with the proposed bp protective provisions during the examination and is able to advise the Secretary of State of the full implications of disapplying or not disapplying the IA in circumstances where no commercial resolution has been reached between the parties by the end of the examination."

19. Further submissions made by BP at the Deadline 3 and Deadline 4 stages have not materially added anything beyond what is set out above. The relevant provision seeking to disapply the IA has though been amended so that it now reads "*From the date of this Order, the Interface Agreement shall no longer have effect, and no claim may be made, nor award granted, for any damages as a result of any alleged antecedent breach of the Interface Agreement prior to the date of this Order.*"

The legal submissions on behalf of Orsted

20. The legal submissions are divided into the following sections:
    i. The proper legal characterisation of what BP seek;
    ii. The proper interpretation of the scope of s. 120(3) of the PA 2008;
    iii. Why BP's disapplication should not be included in the DCO even assuming there is a power to do so.

(i) The proper legal characterisation of what BP seek

a. Introduction

21. By way of introduction, the following points are made.

22. First, as set out above, there is agreement between BP and Orsted as to the nature of the IA. It is an agreement that governs their "*commercial relationship*". It being a commercial

agreement it can in the ordinary way be waived or varied by renegotiation and agreement between the parties.

23. Second, the effect of the provisions sought by BP is to exclude Orsted from the Overlap Zone and also, crucially for these purposes, to deprive them of their contractual rights to compensation in respect of this. Compensation in this regard is something explicitly provided for in the IA. The IA was, of course, freely entered into and has been in force since 2013. BP acceded to the IA as recently as 2021 without any variation of the compensations (or other) provisions. What BP seeks, via the provisions it proposes are included in the DCO, is to wholly circumvent its commercial obligations. Obligations which it freely, and only very recently, took on. It seeks to do so to the detriment of Orsted which is left without either access to the Overlap Zone or any contractual (or other) rights to compensation.

24. Third, despite carrying out extensive legal research, there does not appear to be any precedent, in terms of previous DCOs, to support the inclusion of provisions, the effect of which is described as the disapplication of a private commercial agreement. There is no jurisprudence either which supports this. By their own admission, neither have BP found any precedent (as per their Deadline 2 submission): "*We recognise that seeking to disapply a commercial agreement of this sort via provision in a DCO is unusual and possibly unprecedented*".

25. Fourth, where under the PA 2008 there is provision for the abrogation or modification of existing land agreements, through the compulsory acquisition regime, then this is accompanied by compensation mechanisms to ensure the affected party is compensated for loss of its private rights. In this case, however, BP is seeking to remove all of the Applicant's private contractual rights without the availability of any statutory right to compensation. Indeed, to make matters worse, BP is seeking specifically to remove the rights to compensation which Orsted currently has under the IA.

b. The Human Rights Act 1998 ("the HRA 1998")

26. S. 3(1) of the HRA 1998 provides that "*[s]o far as it is possible to do so, primary legislation and subordinate legislation must be read and given effect in a way which is compatible with the Convention rights*". Thus, what might otherwise be seen as wide powers in primary legislation should be read down to ensure compatibility with Convention rights. Reading down means in this context applying a narrow interpretation of legislation in order to

ensure that the legislation remains compatible with Convention Rights. See by way of example ***R. v Waya (Terry)*** [2013] 1 A.C. 294 where the Supreme Court held that the provisions on the confiscation of assets obtained as a result of crime in the Proceeds of Crime Act 2002 had to be read down to ensure that they did not constitute an interference with the peaceful enjoyment of possessions as protected by Article 1, Protocol 1.

27. Article 1, Protocol 1 (a Convention right as defined by s. 1 and Appendix 1 to the HRA 1998) of the European Convention on Human Rights ("**the Convention")** provides:

> "Every natural or legal person is entitled to the peaceful enjoyment of his possessions. No one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general principles of international law.
> The preceding provisions shall not, however, in any way impair the right of a State to enforce such laws as it deems necessary to control the use of property in accordance with the general interest or to secure the payment of taxes or other contributions or penalties."

28. It is now well-established in both the Strasbourg and the domestic case-law that contractual rights can be a "*possession*" for the purposes of Article 1, Protocol 1.

29. The case-law was most recently reviewed by the Court of Appeal in ***Solaria Energy v Department for Business, Energy and Industrial Strategy*** [2021] 1 WLR 2349.

30. In that case, the claimant company entered into a subcontract for the supply of solar panels to a company which had been engaged by a local authority to supply and install solar panels for hundreds of commercial and residential premises. However, within the currency of the subcontract, the Department of Energy and Climate Change ("**DECC**") published a proposal to reduce the subsidies payable by electricity supply companies for power generated by solar panels. The proposal was never implemented because of a court ruling that it was unlawful, but it nevertheless had a significant adverse impact on the solar energy industry. Seven years after the publication of the proposal, the claimant company brought a claim against the DECC's successor, the Department for Business, Energy and Industrial Strategy ("**DBEIS**"), under s. 7 of the HRA 1998, seeking damages for wrongful interference with the claimant's "*possession*", namely the subcontract, in breach of its right to peaceful enjoyment of its possessions, guaranteed by Article 1, Protocol 1 of the Convention. In particular, the claimant company contended that, as a result of the publication of the proposal it had been obliged to renegotiate the subcontract at a lower rate. At first instance the claim was struck out on the basis that: (i) the subcontract was not a "*possession*" protected by Article 1, Protocol 1 and (ii) that the claim

was time-barred. The Court of Appeal overturned the finding on (i), albeit it upheld the finding on (ii).

31. The Court of Appeal reviewed the previous case-law, in particular two earlier Court of Appeal decisions, namely ***Murungaru v Secretary of State for the Home Department*** [2009] INLR 180 and ***Breyer Group plc v Department of Energy and Climate Change*** [2015] 1 WLR 4559. In ***Breyer***, the Court of Appeal held that where a contract had been concluded, and a party had enforceable rights pursuant to the same, that contract will constitute a "*possession*" within the scope of Article 1, Protocol 1: "*Contracts which have been secured may be said to be part of the goodwill of a business because they are the product of its past work*": see para. 49. In other words, concluded contracts are part and parcel of a business's marketable goodwill because they have been achieved by dint of the business's hard work. This is relevant because the Strasbourg Court has long recognised that the marketable goodwill of a business may constitute a possession qualifying for Article 1, Protocol 1's protection: see e.g. ***Van Marle v The Netherlands*** (1986) 8 EHRR 483. In ***Breyer*** the Court of Appeal also reasoned that the claimant companies had a legitimate expectation in respect of profits they would make from concluded contracts (which were themselves "possessions" within the meaning of Article 1, Protocol 1): "*[w]here the contracts were 'matters of hope or aspiration' there was not a sufficient property right to which the legitimate expectation could be attached. But where a contract had been concluded prior to the proposal, there was a legitimate expectation that there would be no interference with it*" (see para. 52). It is, of course, well established that a legitimate expectation can constitute a possession for the purposes of Article 1, Protocol 1: see, e.g., ***Pine Valley Developments Ltd and Others v Ireland*** (1992) 14 EHRR 319.

32. In ***Solaria*** Coulson LJ., with whom the other members of the Court agreed, having undertaken a review of this case-law said at para. 34 (emphases added):

> "Whilst not all contracts are possessions within the meaning of A1P1, <u>the starting point must be that a signed and part-performed commercial contract is, prima facie, a possession</u>. Indeed, that was the central assumption in ***Breyer***. On that basis, the subcontract into which Solaria had entered with GBBS was a possession. <u>It was a commercial arrangement which was of value to Solaria. It had a value in monetary terms without the need for it having first been converted into money</u>. On the face of it, if the Department wrongly interfered with the performance of that subcontract without justification, then that could trigger a claim for wrongful interference by reference to A1P1"

33. Coulson LJ went on to reject the view, taken by the Judge below, that to be a "*possession*" a contract had to be assignable. This was held to be a relevant factor in determining if a contract is a "*possession*" for Article 1, Protocol 1 purposes but it is not determinative. Of course here the IA is clearly assignable – see the provisions in clause 8 on succession. It was these that resulted in the deed of covenant and adherence which BP entered into in 2021 to perform and observe the obligations of the Carbon Entity under the IA.

34. There are some other cases, not apparently cited in ***Solaria***, which further support the view that commercial contracts, especially where signed and part-performed, are a "*possession*" for these purposes:
    i. In ***Solaria*** Coulson LJ remarked (see para. 31) that most of the Strasbourg cases appear largely to be "*not concerned with claims for wrongful interference with an existing contract. They are concerned with less tangible rights, like a licence or inclusion on a register*" and that (para. 26) "*[a]uthorities involving an alleged interference with existing contracts are far fewer in number, perhaps because a contract may comprise a rather more obvious "possession" than a licence or a place on a register*". However,
        i. in ***Association of General Practitioners v Denmark*** 62 DR 226 at 234 (not cited in ***Solaria)*** the compliant related to changes in the contracts between GPs and the health service effected by legislation and having the effect of reducing the fees payable to GPs. The Commission in Strasbourg ruled that the applicants were correct to contend that contractual rights could constitute "*possessions*";
        ii. in ***Stran Greek Refineries and Stratis Andreadis v Greece*** (1995) 19 EHRR 293 the Greek Government had been the subject of an arbitration award under a contract. In response it used a legislative provision that allowed the state to terminate contracts where this was adjudged to be in the interests of the national economy. The Strasbourg Court found there to be a "*possession*" for Article 1, Protocol 1 purposes. It went on to hold that there was an interference with the applicants' right of property as guaranteed by Article 1, Protocol 1 since the legislative provision made it impossible for them to secure enforcement of an arbitration award having final effect and under which the state was required to pay them specified sums in respect of expenditure which they had incurred in seeking to fulfil their contractual

obligations, or even for them to take further action to recover the sums in question through the courts;

ii. Further, in ***Wilson v First County Properties Ltd.*** [2004 1 AC 816 Lord Nicholls (with whom Lord Hope, Lord Hobhouse and Lord Scott agreed) said (at para. 39) "*"Possessions" in article 1 is apt to embrace contractual rights as much as personal rights. Contractual rights may be more valuable and enduring than proprietary rights*". That case concerned a loan agreement entered into between the claimant and the defendant pawnbrokers in January 1999 which breached regulations made pursuant to s. 60(1) of the Consumer Credit Act 1974 1 by failing correctly to state the amount of the credit so that s. 127(3) of the Act barred the court from enforcing the agreement. This was alleged to be an interference with rights under Article 1, Protocol 1. In that case, a declaration of incompatibility under s. 4 of the HRA 1998 was made.

35. On the basis of the above case-law, it is clear that:
    i. the IA itself, and the contractual rights it confers on Orsted, constitute a "*possession*" for the purposes of Article 1, Protocol 1;
    ii. the provisions which BP seek to have included in the DCO, were they to be included, would "*interfere*" with that "*possession*".

36. The case-law categorises "interferences" under Article 1, Protocol 1 into three categories (in decreasing order of severity): (i) a deprivation; (ii) an interference in peaceful enjoyment and (iii) a control of use.

37. The effect of the provisions BP seeks would be, it is submitted, to deprive Orsted of all the benefit of the IA. As such, it is submitted that what is involved here is an interference which amounts to a de facto deprivation. The case-law is clear that where what is involved is a deprivation, then for it to be justified in the public interest under Article 1, Protocol 1 compensation must be payable other than in the most exceptional circumstances and that is so even where the public interest pursued is strong.

38. In this case, as already noted, the provisions BP contend for are designed to deprive Orsted of any and all contractual rights, including to compensation, which would otherwise be due to it under the IA. This deprivation is proposed to be effected via the DCO and without any form of compensation being payable. The effect of what BP propose is

essentially that the state effect the compulsory acquisition (deprivation) of Orsted's contractual rights under the IA, which rights which constitute a "*possession*" for the purposes of Article 1, Protocol 1.

39. If it was not accepted that what is involved here is to be classified under Article 1, Protocol 1 as a "*deprivation*", although it is difficult to see how it could not be, then it would fall into the second category of interferences, namely "*an interference with peaceful enjoyment*". As noted above depending on the severity of the interference, compensation may be required in order for there to be a "*fair balance*" under Article 1, Protocol 1: see ***Sporrong v Sweden*** (1983) 5 E.H.R.R. 35 at paras. 58 and 60. In that case the measures imposed by the state were held not to constitute a formal or de facto deprivation but were nonetheless adjudged to be of such severity that they were not justified without there being compensation. See also in this regard ***Stran Refineries*** (above) at paras. 68 – 69.

40. In ***Mott v Environment Agency*** [2018] 1 WLR 1022 the Supreme Court upheld the findings of the Courts below that it was not necessary to categorise the measure as either expropriation or control. It was enough that it "*eliminated at least 95% of the benefit of the right*", thus making it "*closer to deprivation than mere control*" (see para. 36). The claimant in ***Mott*** was the joint leasehold owner of a right to fish for salmon at Lydney in the estuary of the River Severn, using a putcher rank of individual conical baskets to trap adult fish making their way back from the sea to the river of their birth to spawn. Under his licence the claimant was able to catch about 600 salmon per year until the defendant Environment Agency, pursuant to paragraph 14A of Schedule 2 to the Salmon and Freshwater Fisheries Act 1975, as inserted, imposed conditions reducing the permissible catch to 30.

41. In the present case what BP proposes deprives Orsted of *all* of its contractual rights. As compared to the facts in ***Mott*** this is *a fortiori* a deprivation.

42. Even where the interference is not classified as a deprivation, the availability or otherwise of compensation, especially for interferences but also for controls of use, is highly material in determining whether a "*fair balance*" has been struck for the purposes of Article 1, Protocol 1: see ***Mott***. In ***Mott*** the Supreme Court noted that (see para. 22) that an authoritative summary of the principles is found in the Grand Chamber decision in ***Hutten-Czapska v Poland*** (2006) 45 EHRR 4 , para 167:

> "Not only must an interference with the right of property pursue, on the facts as well as in principle, a 'legitimate aim' in the 'general interest', but there must also be a reasonable relation of proportionality between the means employed and the aim sought to be realised by any measures applied by the state, including measures designed to control the use of the individual's property. That requirement is expressed by the notion of a 'fair balance' that must be struck between the demands of the general interest of the community and the requirements of the protection of the individual's fundamental rights.
> The concern to achieve this balance is reflected in the structure of article 1 of Protocol No 1 as a whole. In each case involving an alleged violation of that article the court must therefore ascertain whether by reason of the state's interference the person concerned had to bear a disproportionate and excessive burden."

(ii) <u>The proper interpretation of the scope of s.120(3) of the PA 2008</u>

43. S. 120(3) and (4) of the PA 2008 provide:

> "(3) An order granting development consent may make provision relating to, or to matters ancillary to, the development for which consent is granted.
> (4) The provision that may be made under subsection (3) includes in particular provision for or relating to any of the matters listed in Part 1 of Schedule 5."

44. There are a number of points that can be made about these sub-sections.

45. <u>First,</u> it is not argued by BP (and rightly so) that what it proposes falls within any of the specific matters listed in Part 1 of Schedule 5. Instead, BP places reliance on the terms of s. 120(3) itself and the reference to a DCO being able to include "*provision relating to, or to matters ancillary to, the development*".

46. <u>Second</u>, while on the face of it these are widely drawn words, what s. 120(3) is being relied on for here is to empower the Secretary of State to "*disapply*" a commercial agreement. That is to say, in effect, to deprive Orsted of all of its contractual rights under the IA.

47. In relation to this:
    i. "*It is a principle of legal policy that by the exercise of state power the property or other economic interests of a person should not be taken away, impaired or endangered, except under clear authority of law*": see Bennion, Bailey and Norbury on Statutory Interpretation at section 27.6. The authors note that "*[i]nterference with property may take many forms*" and that "*[m]any decisions illustrate the reluctance of courts to countenance statutory interference with property rights unless there is clear authority to do so*";
    ii. One of the cases cited in support of this last proposition ***is Allen v Thorn Electrical Industries Ltd*** [1968] 1 QB 487 at 503 where it was said by Lord Denning MR (with whom the other members of the Court agreed) that if the "*requirement in the statute*

is ambiguous and uncertain: in which case the rights under the contract must prevail. No man's contractual rights are to be taken away on an ambiguity in a statute". The law report (at 495) records the submissions to the Court. These submissions set the context for this observation of Lord Denning MR: "*on well known principles a statute which seeks to fetter freedom of contract and a fortiori to take away an accrued legal right must be construed strictly so that it interferes as little as possible with those rights; and (b) if there is an ambiguity, such as a word or phrase capable of two possible constructions, the court will adopt that which will do less violence to accrued rights and the freedom of the subject:* ***Marshall v. Blackpool Corporation*** [[1933] 1 KB 688]*, per Lord Hewart C.J.9"*;

iii. In the ***Marshall*** case Lord Hewart said at 693:

> "He referred, in support of the general proposition, to the well known case of ***Central Control Board (Liquor Traffic) v. Cannon Brewery Co., Ld***. where Lord Atkinson, referring to what he described as a canon of construction of statutes well recognized, said: "That canon is this: that an intention to take away the property of a subject without giving to him a legal right to compensation for the loss of it is not to be imputed to the Legislature unless that intention is expressed in unequivocal terms." Finally, in the case of ***Attorney-General v. Horner***, Brett M.R. said: "It seems to me that it is a proper rule of construction not to construe an Act of Parliament as interfering with or injuring persons' rights without compensation, unless one is obliged to so construe it. If it is clear and obvious that Parliament has so ordered, and there is no other way of construing the words of the Act, then one is bound to so construe them, but if one can give a reasonable construction to the words without producing such an effect, to my mind one ought to do so."

iv. Moreover, in the context of the compulsory acquisition of land the Supreme Court held in ***R (Sainsbury's Supermarkets Ltd) v Wolverhampton CC*** [2011] 1 AC 437 that:

> "9 Compulsory acquisition by public authorities for public purposes has always been in this country entirely a creature of statute: ***Rugby Joint Water Board v Shaw-Fox*** [1973] AC 202, 214. The courts have been astute to impose a strict construction on statutes expropriating private property, and to ensure that rights of compulsory acquisition granted for a specified purpose may not be used for a different or collateral purpose: see Taggart, "Expropriation, Public Purpose and the Constitution", in *The Golden Metwand and the Crooked Cord: Essays on Public Law in Honour of Sir William Wade*, (1998) ed Forsyth & Hare, p 91.
>
> 10 In ***Prest v Secretary of State for Wales*** (1982) 81 LGR 193, 198 Lord Denning MR said:
>
> > "I regard it as a principle of our constitutional law that no citizen is to be deprived of his land by any public authority against his will, unless it is expressly authorised by Parliament and the public interest decisively so demands …"
>
> and Watkins LJ said, at pp 211—212:
>
> > "The taking of a person's land against his will is a serious invasion of his proprietary rights. The use of statutory authority for the destruction of

those rights requires to be most carefully scrutinised. The courts must be vigilant to see to it that that authority is not abused. It must not be used unless it is clear that the Secretary of State has allowed those rights to be violated by a decision based upon the right legal principles, adequate evidence and proper consideration of the factor which sways his mind into confirmation of the order sought."

11 Recently, in the High Court of Australia, French CJ said in ***R & R Fazzolari Pty Ltd v Parramatta City Council*** [2009] HCA 12, paras 40, 42, 43:

"40. Private property rights, although subject to compulsory acquisition by statute, have long been hedged about by the common law with protections. These protections are not absolute but take the form of interpretative approaches where statutes are said to affect such rights.

42. The attribution by Blackstone, of caution to the legislature in exercising its power over private property, is reflected in what has been called a presumption, in the interpretation of statutes, against an intention to interfere with vested property rights . . .

43. The terminology of "presumption" is linked to that of "legislative intention". As a practical matter it means that, where a statute is capable of more than one construction, that construction will be chosen which interferes least with private property rights." …

While the above passage is focussed on the taking of land (or other private property rights) these principles are also applicable, it is submitted, to the abrogation by the state of other contractual rights. This is so not least because, as Lord Nicholls recognised in ***Wilson*** (see above), "*[c]ontractual rights may be more valuable and enduring than proprietary rights*". This view is also strongly supported by the reasoning in the ***Allen*** case (see above) and the Article 1, Protocol 1 case-law;

v. Further, the principle against expropriation or other interference with the enjoyment of property, and other similar rights, is likely to carry particular weight in cases where no compensation is available: see Bennion et all (*ibid.)*. As Brett MR said in ***A-G v Horner*** (1884) 14 QBD 245 at 257 "*[i]t is a proper rule of construction not to construe an Act of Parliament as interfering with or injuring persons' rights without compensation unless one is obliged so to construe it.*" This was approved in ***Consett Iron Co Ltd v Clavering Trustees*** [1935] 2 KB 42 at 58; ***Bond v Nottingham Corpn*** [1940] Ch 429 at 435 and see also ***Wells v London, Tilbury and Southend Rly Co*** (1877) 5 Ch D 126 at 130);

vi. Finally, the contractual rights sought to be disapplied are also "*possessions*" for the purposes of Article 1, Protocol 1, which are being interfered with. S. 3 of the HRA 1998 must thus be used to "read down" the scope of s. 120(3) of the PA 2008. This is required because the effect of s. 120(3) of the PA 2008, if interpreted as BP

contends, facilitates Orsted being deprived of its contractual rights – a possession – without any compensation. In contrast under the PA 2008, any compulsory acquisition of land or rights over land is subject to compensation rights: see e.g. s. 126 of the PA 2008. Here the position is especially egregious as the contractual rights "*disapplied*" explicitly provide for compensation. The clear aim of BP's provisions being to prevent there being any such compensation. If s. 120(3) of the PA 2008 is used to effect this then that would be, it is submitted, a breach of Article 1, Protocol 1: see above.

48. For all these reasons, it is submitted that, s. 120(3) should not be construed as allowing for the overriding of contractual rights in a commercial agreement. That sub-section should be interpreted narrowly and as not authorising the disapplication (deprivation) of valuable contractual rights absent any compensation.

49. If contrary to the above s. 120(3) is interpreted as providing the power (that is to say the *vires*) to the Secretary of State to do what BP seek, then that power should not be exercised for the following reasons.

(iii) <u>Why BP's disapplication should not be included in the DCO even assuming there is a power to do so</u>

a. <u>Introduction</u>

50. Orsted contends that disapplying the IA would not be appropriate, even assuming there was *vires* to do so, for these reasons:

i. What is proposed is wholly unprecedented;

ii. It is contrary to public policy to interfere with an existing commercial relationship in the way proposed;

iii. Because effect of the provisions would be to deprive Orsted of its contractual rights, rights which are a "*possession*" for Article 1, Protocol 1 purposes, this requires it to be established by BP that this would be in the public interest and they have not discharged that burden;

iv. The Crown Estate's consent would be required and has not been obtained.

b. <u>The precedent issue</u>

51. As noted above there is no precedent for a DCO ever having been used to disapply a private commercial agreement.

52. In this regard it should be noted that the Secretary of State for Transport in granting the recent DCO for the M54 to M6 Link Road rejected one of the proposed provisions (see p. 30 of the decision letter dated 21 April 2022) because the "*Secretary of State notes that this provision appears to be unprecedented. While reference to precedents have been set out in the explanatory memorandum none of them have a provision that is the equivalent …*".

c. <u>The public policy issue</u>

53. Even assuming that (contrary to what is submitted above) s. 120(3) allows for the disapplication (or rather deprivation) of contractual rights under a commercial agreement, a view needs to be taken by the Secretary of State as to whether it is in fact appropriate to do so in this case. Orsted contends that this would be inappropriate for a number of reasons.

54. <u>First,</u> freedom of contract remains a general principle of the common law. Thus in Chitty at para. 2-004 under the heading "Freedom of contract in the modern common law" it is said that:

> "Freedom of contract as a general principle of the common law retains considerable support. For example, in 1966, Lord Reid rejected the idea that the doctrine of fundamental breach was a substantive rule of law, negativing any agreement to the contrary (and capable of being used to strike down an exemption clause) on the ground, inter alia, that this would restrict "the general principle of English law that parties are free to contract as they may think fit". In 1980, in the same context, Lord Diplock observed that:
>
> "A basic principle of the common law of contract … is that parties to a contract are free to determine for themselves what primary obligations they will accept."
>
> This support remains particularly strong in commercial contexts. So Lord Bingham of Cornhill stated that "[l]egal policy favours the furtherance of international trade. Commercial men must be given the utmost liberty of contracting". Moreover, English courts have proved unwilling to strike down contracts on the ground simply that one of the parties suffered from an "inequality of bargaining power"."

55. This is the same principle that underlies the rule of construction, see above, against legislation being interpreted as interfering with contractual rights unless that is very clearly the intention.

56. <u>Second</u>, in this case, as already noted:

i. The IA is a commercial agreement;

ii. It was entered into, and has been in place, since 2013. It has thus since then governed the commercial relationship of the Carbon Entity and the Wind Entity and regulated the proposed co-existence between the wind and carbon projects, and their respective promoters, in the Overlap Zone;

iii. Importantly, one of the stated purposes of the IA (see clause 2.1) was "*to provide sufficient certainty to the Entities to be able to plan and implement their respective projects*". BP's proposals are the antithesis of this, and undermine Orsted's legitimate expectations;

iv. The IA is capable of being varied by commercial re-negotiation, as indeed it was in 2016;

v. BP acceded to the IA in 2021 without any modification of its terms.

57. Given, (i) the length of time the contract has been in place; (ii) the fact that it can be varied via commercial agreement and (iii) BP as late as 2021 acceded to it without any modification of terms, the Secretary of State should be very reluctant to use any power under the PA 2008 (assuming there is such power) to circumvent commercial obligations freely entered into, via the DCO process. This would be an affront to the common law principle of freedom of contract and would destroy the certainty that the IA was entered into to provide. It is, as noted above, especially egregious given that what is proposed is that the DCO removes contractual rights to compensation and that it does so with no other right to compensation under the PA 2008 or otherwise. Moreover, BP's contention that their understanding of the technical evidence has evolved since the IA was entered into is no justification for what is proposed, given that they acceded to it only in 2021. In any event, if it is the case that the IA no longer suits BP's commercial interests then it should seek to deal with this via negotiations not by seeking to employ the power of the state to deprive Orsted of its contractual rights without compensation.

58. Third, in oral submissions made against BP's proposed disapplication at the Issue Specific Hearing 1 on Tuesday 12 April 2022 Orsted contended that what is proposed would be an abuse of process. Abuse of process has been defined as *"using that process for a purpose or in a way significantly different from its ordinary and proper use"*: see ***Attorney General v Barker*** [2000] 1 FLR 759. It has been emphasised in the case-law that the scope of the concept of abuse of process is not a closed one. In this case BP is seeking to use protective provisions

in a DCO for a purpose it accepts is "*unusual*" and "*unprecedented*". Moreover, what is proposed by BP is an abuse because it is seeking, quite wrongly, to use the DCO process to escape freely entered into commercial obligations. Obligations that were intended to provide certainty for both parties going forward.

d. <u>The public interest issue</u>

59. There appears to be agreement between BP and Orsted that the Secretary of State must be satisfied that the provisions BP propose be included in the DCO are in the public interest. That this is the case is strongly supported by:

    i. The fact that what is proposed constituted an interference with a "*possession*" under Article 1, Protocol 1 and so is only lawful if done, inter alia, "*in the public interest*".

    ii. Even leaving aside the Convention, what is proposed here is in effect compulsory acquisition of valuable contractual rights. For that to be justified it must be shown that the public interest decisively demands this: see by analogy the ***Sainsbury's*** case above. Indeed, in relation to compulsory acquisition of land, the law generally requires the decision-maker: (i) to be satisfied that there is a compelling case in the public interest for the exercise of such powers; and (ii) to exercise such a power only as a "last resort" e.g. the party seeking the power be exercised having first made efforts to acquire the interests voluntarily. These principles are also applicable, it is submitted, to other processes that interfere with private rights. Thus, for example, the use by local authorities of what is now s. 203 of the Housing and Planning Act 2016 ("the HPA 2016") and what was previously s. 237 of the Town and Country Planning Act 1990 ("the TCPA 1990"). The provision confers a right to override easements and other rights and restrictions such as covenants. The provision is most commonly invoked in respect of rights to light, thereby removing the risk of injunction and converting these property rights and any actionable claims into mere claims for compensation under s. 204 of the HPA 2016. In R ***Leeds CC, ex p Leeds Industrial Co-operative Society Limited*** (1997) 73 P&CR 70 McCullough J considered the approach to be taken by a local authority when considering whether to appropriate land in order to engage s. 237 of the TCPA 1990. He considered that as the application of s. 237 would materially affect rights of third parties any appropriation should only be effected where the authority considered that it "*has good reason to believe that interference with such rights is*

necessary" (see p. 77). He saw appropriation in such circumstances "*as the equivalent of compulsory purchase*".

60. The disapplication of the IA is: (i) unprecedented (see above); (ii) affects very seriously the contractual rights of Orsted; and (iii) is sought for the benefit of BP. In those circumstances, the burden of proof lies on BP to establish that in fact what it proposes is in the public interest. Orsted is of course the applicant for the DCO but it does not seek any provisions disapplying the IA. Indeed it actively opposes these. It is BP which seeks to use the DCO process to disapply the IA agreement. BP must make out a case in the public interest. It must undertake an exercise similar to what the Examining Authority would expect BP to be doing if it was itself promoting a DCO and seeking compulsory acquisition. BP's case comes nowhere near this.

61. In relation to the case that has been advanced by BP there are a number of points.

62. First, BP's position is that the disapplication of the IA is in the public interest on the basis that if Orsted claimed compensation under the IA, this may be disallowed in the regulatory funding model being provided to support carbon capture and storage by DBEIS. If so, the viability of the Endurance Project would be prejudiced and that would not be in the public interest (see BP's response to Orsted's Deadline 1 submissions, annex 2 para. 2.12). Orsted's position is that the terms of the IA have been known since 2013 and the potential liability for compensation should have been factored into the financial model and viability assessment for the Endurance Project (including its bid and documentation submitted to BEIS).

63. Second, Orsted's position is also that both the Endurance Project and the Hornsea Project will operate in a public subsidy framework, the mechanisms for which encourage a reduction in the cost of energy, and both projects are in the public interest. To the extent, if any, that the public interest submissions made by BP in relation to the effect of compensation of the viability of the Endurance Project are sound, they equally apply to the Hornsea Project. In the absence of compensation from BP under the IA and a reduction in the developable area owing to exclusion from the Overlap Zone, the viability of the Hornsea Project would be prejudiced.

64. The Secretary of State in determining whether to make the DCO is bound by s. 6(1) of the HRA 1998 which provides that "*[i]t is unlawful for a public authority to act in a way which is incompatible with a Convention right*". Thus, if it is accepted that the inclusion of the provisions sought by BP would result in an unlawful interference with Orsted's rights under Article 1, Protocol 1, the Secretary of State must refuse to include that provision in the DCO. The PA 2008 contains other provisions which seek to ensure that at the DCO stage there is no violation of the HRA 1998: see ***Spurrier v Secretary of State for Transport*** [2020] PTSR 240 at paras. 37 and 661 – 665.

e. <u>The Crown Estate issue</u>

65. If the Secretary of State does have power to include a provision in the DCO disapplying the IA, and considers it would otherwise be appropriate to do so, then this would require consent of the Commissioners pursuant to s. 135(2) PA 2008 which provides:

> "An order granting development consent may include any other provision applying in relation to Crown land, or rights benefiting the Crown, only if the appropriate Crown authority consents to the inclusion of the provision".

66. Orsted is unaware that any such consent has either been sought from the Commissioners or granted. Orsted have previously raised this point see its Deadline 1 position statement at para. 7.2 and its oral submissions at the Issue Specific Hearing 1 on Tuesday 12 April 2022. The only response so far from BP has been to say in its Deadline 1 position statement "*Besides Orsted and bp, the other party bound by the IA is TCE. We do not consider there is any adverse impact on TCE through the disapplication of the IA given the limited nature of the provisions relevant to TCE in the IA*". The mere assertion by BP that they consider the Commissioners would not be adversely affected is not the same as seeking and obtaining the consent. There is no evidence of any consent being obtained. Absent that consent the provisions may not be included in the DCO.

<u>Conclusions</u>

67. For all these reasons, the provisions proposed by BP should be rejected.

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Wednesday, 08 June 2022

Appendix D

List of Tables in Appendix D

Gannet Collision Risk In-combination Totals

Table 1. FFC SPA gannet feature apportioned collision risk in-combination when considering the Applicant's approach to assessment of Hornsea Four (including consideration of macro avoidance).

Project	Breeding	Autumn	Spring	Annual	Annual (including a macro avoidance rate of 60 – 80%)	Tier
Beatrice	0.0	2.3	0.6	2.9	1.2 - 0.6	1a
Blyth Demonstration Site	0.0	0.1	0.2	0.3	0.1	1a
Dudgeon	22.3	1.9	1.2	25.3	10.1 - 5.1	1a
East Anglia One	3.4	6.3	0.4	10.1	4 - 2	1a
EOWDC	0.0	0.3	0.0	0.3	0.1	1a
Galloper	0.0	1.5	0.8	2.3	0.9 - 0.5	1a
Greater Gabbard	0.0	0.4	0.3	0.7	0.3 - 0.1	1a
Gunfleet Sands	-	-	-	-	-	1a
Hornsea Project One	11.5	1.5	1.4	14.4	5.8 - 2.9	1a
Humber Gateway	1.9	0.1	0.1	2.0	0.8 - 0.4	1a
Hywind 2 Demonstration	0.0	0.0	0.1	0.1	0 .0	1a
Kentish Flats	0.0	0.0	0.1	0.1	0 .0	1a
Kentish Flats Extension	-	-	-	-	-	1a
Kincardine	0.0	0.0	0.0	0.0	0.0	1a
Lincs, Lynn & Inner Dowsing	2.3	0.1	0.1	2.5	1 - 0.5	1a
London Array	0.0	0.1	0.1	0.2	≤0.1	1a
Methil	0.0	0.0	0.0	0.0	0.0	1a
Race Bank	33.7	0.6	0.3	34.5	13.8 - 6.9	1a
Rampion	0.0	3.1	0.1	3.2	1.3 - 0.6	1a
Scroby Sands	-	-	-	-	-	1a
Sheringham Shoal	14.1	0.2	0.0	14.3	5.7 - 2.9	1a
Teesside	2.4	0.1	0.0	2.5	1 - 0.5	1a
Thanet	0.0	0.0	0.0	0.0	0.0	1a
Westermost Rough	0.2	0.0	0.0	0.2	≤0.1	1a
Hornsea Project Two	7.0	0.7	0.4	8.0	3.2 - 1.6	1b
Moray East	0.0	1.7	0.6	2.3	0.9 - 0.5	1b
Neart na Gaoithe	0.0	2.3	1.4	3.7	1.5 - 0.7	1b
Seagreen Alpha & Bravo	0.0	2.4	4.1	6.4	2.6 - 1.3	1b
Triton Knoll	26.8	3.1	1.9	31.7	12.7 - 6.3	1b
Dogger Bank A & B	40.6	4.0	3.4	47.9	19.2 - 9.6	1c
Dogger Bank C & Sofia	7.4	0.5	0.7	8.5	3.4 - 1.7	1c
East Anglia Three	6.1	1.6	0.6	8.3	3.3 - 1.7	1c
Hornsea Three	6.4	0.2	0.3	6.9	2.7 – 1.4	1c

Project	Breeding	Autumn	Spring	Annual	Annual (including a macro avoidance rate of 60 – 80%)	Tier
Inch Cape	0.0	1.4	0.3	1.7	0.7 - 0.3	1c
Moray West	0.0	0.1	0.1	0.2	≤0.1	1c
Norfolk Boreas	14.2	0.6	0.2	15.1	6 - 3	1c
Norfolk Vanguard	8.2	0.9	0.3	9.4	3.8 - 1.9	1c
East Anglia ONE North	12.4	0.5	0.1	13.0	5.2 - 2.6	1c
East Anglia TWO	12.5	1.1	0.2	13.8	5.5 - 2.8	1c
Total (Consented Projects Only)	**233.4**	**39.4**	**20.1**	**292.8**	**117.1 – 58.6**	
Hornsea Four (Applicant's Approach)	6.7	0.2	0.1	7.1	2.8 - 1.4	1d
Total (Hornsea Four plus all consented projects only)	240.1	39.7	20.2	299.8	**119.9 – 60.0**	
Dudgeon Extension Project	1.4	0.1	0.0	1.6	0.6 - 0.3	1d
Sheringham Shoal Extension Project	0.2	0.0	0.0	0.2	≤0.1	1d
Rampion 2	0.0	16.6	8.9	25.5	10.2 - 5.1	2
Total (All Projects)	**241.7**	**56.4**	**29.1**	**327.1**	**130.9 – 65.4**	

Table 2. FFC SPA gannet feature apportioned collision risk in-combination totals when considering Natural England's approach to assessment of Hornsea Four (including consideration of macro avoidance).

Project	Breeding	Autumn	Spring	Annual	Annual (including a macro avoidance rate of 60 – 80%)	Tier
Beatrice	0.0	2.3	0.6	2.9	1.2 - 0.6	1a
Blyth Demonstration Site	0.0	0.1	0.2	0.3	0.1	1a
Dudgeon	22.3	1.9	1.2	25.3	10.1 - 5.1	1a
East Anglia One	3.4	6.3	0.4	10.1	4 - 2	1a
EOWDC	0.0	0.3	0.0	0.3	0.1	1a
Galloper	0.0	1.5	0.8	2.3	0.9 - 0.5	1a
Greater Gabbard	0.0	0.4	0.3	0.7	0.3 - 0.1	1a
Gunfleet Sands	-	-	-	-	-	1a
Hornsea Project One	11.5	1.5	1.4	14.4	5.8 - 2.9	1a
Humber Gateway	1.9	0.1	0.1	2.0	0.8 - 0.4	1a
Hywind 2 Demonstration	0.0	0.0	0.1	0.1	0 .0	1a
Kentish Flats	0.0	0.0	0.1	0.1	0 .0	1a
Kentish Flats Extension	-	-	-	-	-	1a
Kincardine	0.0	0.0	0.0	0.0	0.0	1a
Lincs, Lynn & Inner Dowsing	2.3	0.1	0.1	2.5	1 - 0.5	1a
London Array	0.0	0.1	0.1	0.2	≤0.1	1a
Methil	0.0	0.0	0.0	0.0	0.0	1a
Race Bank	33.7	0.6	0.3	34.5	13.8 - 6.9	1a
Rampion	0.0	3.1	0.1	3.2	1.3 - 0.6	1a
Scroby Sands	-	-	-	-	-	1a
Sheringham Shoal	14.1	0.2	0.0	14.3	5.7 - 2.9	1a
Teesside	2.4	0.1	0.0	2.5	1 - 0.5	1a
Thanet	0.0	0.0	0.0	0.0	0.0	1a
Westermost Rough	0.2	0.0	0.0	0.2	≤0.1	1a
Hornsea Project Two	7.0	0.7	0.4	8.0	3.2 - 1.6	1b
Moray East	0.0	1.7	0.6	2.3	0.9 - 0.5	1b
Neart na Gaoithe	0.0	2.3	1.4	3.7	1.5 - 0.7	1b
Seagreen Alpha & Bravo	0.0	2.4	4.1	6.4	2.6 - 1.3	1b
Triton Knoll	26.8	3.1	1.9	31.7	12.7 - 6.3	1b
Dogger Bank A & B	40.6	4.0	3.4	47.9	19.2 - 9.6	1c
Dogger Bank C & Sofia	7.4	0.5	0.7	8.5	3.4 - 1.7	1c
East Anglia Three	6.1	1.6	0.6	8.3	3.3 - 1.7	1c
Hornsea Three (Natural England's approach)	6.4	0.2	0.3	6.9	2.7 – 1.4	1c
Inch Cape	0.0	1.4	0.3	1.7	0.7 - 0.3	1c
Moray West	0.0	0.1	0.1	0.2	≤0.1	1c

Project	Breeding	Autumn	Spring	Annual	Annual (including a macro avoidance rate of 60 – 80%)	Tier
Norfolk Boreas	14.2	0.6	0.2	15.1	6 - 3	1c
Norfolk Vanguard	8.2	0.9	0.3	9.4	3.8 - 1.9	1c
East Anglia ONE North	12.4	0.5	0.1	13.0	5.2 - 2.6	1c
East Anglia TWO	12.5	1.1	0.2	13.8	5.5 - 2.8	1c
Total (Consented Projects Only)	**233.4**	**39.4**	**20.1**	**292.8**	**117.1 – 58.6**	
Hornsea Four (Natural England's Approach)	14.3	0.3	0.1	14.6	5.8 – 2.9	1d
Total (Hornsea Four plus all consented projects only)	**247.6**	**39.7**	**20.2**	**307.4**	**122.9 – 61.5**	
Dudgeon Extension Project	1.4	0.1	0.0	1.6	0.6 - 0.3	1d
Sheringham Shoal Extension Project	0.2	0.0	0.0	0.2	≤0.1	1d
Rampion 2	0.0	16.6	8.9	25.5	10.2 - 5.1	2
Total (All Projects)	**249.2**	**56.4**	**29.1**	**334.7**	**133.9 – 66.9**	

Gannet Displacement In-combination Totals

Table 3. FFC SPA gannet feature apportioned abundance totals when considering the Applicant's approach to assessment of Hornsea Four.

Project	Breeding	Autumn	Spring	Annual	Tier
Beatrice	0	0	0	0	1a
Blyth Demonstration Site	-	-	-	-	1a
Dudgeon	53	1	1	55	1a
EOWDC	0	0	0	0	1a
Galloper	0	44	17	61	1a
Greater Gabbard	0	3	7	10	1a
Gunfleet Sands	0	1	1	1	1a
Humber Gateway	-	-	-	-	1a
Hywind 2 Demonstration	0	0	0	0	1a
Kentish Flats	-	-	-	-	1a
Kentish Flats Extension	0	1	0	1	1a
Lincs	-	-	-	-	1a
London Array	-	-	-	-	1a
Lynn and Inner Dowsing	-	-	-	-	1a
Methil	0	0	0	0	1a
Race Bank	92	2	2	95	1a
Rampion	0	28	0	28	1a
Scroby Sands	-	-	-	-	1a
Sheringham Shoal	47	2	0	49	1a
Teesside	1	0	0	1	1a
Thanet	-	-	-	-	1a
Westermost Rough	-	-	-	-	1a
East Anglia One	161	175	5	340	1b
Hornsea Project One	671	33	16	720	1b
Hornsea Project Two	457	55	8	519	1b
Moray East	0	14	2	16	1b
Triton Knoll	211	1	2	213	1b
Kincardine	0	0	0	0	1b
Dogger Bank A	259	44	11	314	1c
Dogger Bank B	319	54	14	386	1c
Dogger Bank C	484	18	14	516	1c
East Anglia Three	412	61	33	505	1c
Inch Cape	0	34	13	47	1c
Moray West	0	21	9	30	1c
Neart na Gaoithe	0	27	17	44	1c
Seagreen Alpha	0	14	9	23	1c
Seagreen Bravo	0	18	12	30	1c
Sofia	641	24	15	680	1c
Hornsea Three	844	47	33	924	1c
Norfolk Boreas	1,229	83	33	1,344	1c
Norfolk Vanguard	271	118	27	416	1c

Project	Breeding	Autumn	Spring	Annual	Tier
East Anglia ONE North	149	23	3	174	1c
East Anglia TWO	192	43	12	247	1c
Total (Consented Projects Only)	**6,492**	**986**	**311**	**7,789**	
Hornsea Four (Applicant's Approach)	597	38	25	661	1d
Total (Hornsea Four plus all consented projects only)	**7,089**	**1,024**	**336**	**8,449**	
Dudgeon Extension Project	319	15	3	337	1d
Sheringham Shoal Extension Project	18	13	1	32	1d
Rampion 2	0	4	3	7	2
Total (All Projects)	**7,426**	**1,056**	**343**	**8,825**	

Table 4. FFC SPA gannet feature annual displacement matrix when considering the Applicant's approach to assessment of Hornsea Four in-combination with all consented projects only.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	2	3	3	4	8	17	25	34	42	51	59	68	76	84
10	8	17	25	34	42	84	169	253	338	422	507	591	676	760	845
20	17	34	51	68	84	169	338	507	676	845	1,014	1,183	1,352	1,521	1,690
30	25	51	76	101	127	253	507	760	1,014	1,267	1,521	1,774	2,028	2,281	2,535
40	34	68	101	135	169	338	676	1,014	1,352	1,690	2,028	2,366	2,704	3,042	3,380
50	42	84	127	169	211	422	845	1,267	1,690	2,112	2,535	2,957	3,380	3,802	4,225
60	51	101	152	203	253	507	1,014	1,521	2,028	2,535	3,042	3,549	4,056	4,563	5,070
70	59	118	177	237	296	591	1,183	1,774	2,366	2,957	3,549	4,140	4,732	5,323	5,915
80	68	135	203	270	338	676	1,352	2,028	2,704	3,380	4,056	4,732	5,408	6,084	6,760
90	76	152	228	304	380	760	1,521	2,281	3,042	3,802	4,563	5,323	6,084	6,844	7,604
100	84	169	253	338	422	845	1,690	2,535	3,380	4,225	5,070	5,915	6,760	7,604	8,449

Table 5. FFC SPA gannet feature annual displacement matrix when considering the Applicant's approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	2	3	4	4	9	18	26	35	44	53	62	71	79	88
10	9	18	26	35	44	88	177	265	353	441	530	618	706	794	883
20	18	35	53	71	88	177	353	530	706	883	1,059	1,236	1,412	1,589	1,765
30	26	53	79	106	132	265	530	794	1,059	1,324	1,589	1,853	2,118	2,383	2,648
40	35	71	106	141	177	353	706	1,059	1,412	1,765	2,118	2,471	2,824	3,177	3,530
50	44	88	132	177	221	441	883	1,324	1,765	2,206	2,648	3,089	3,530	3,971	4,413
60	53	106	159	212	265	530	1,059	1,589	2,118	2,648	3,177	3,707	4,236	4,766	5,295
70	62	124	185	247	309	618	1,236	1,853	2,471	3,089	3,707	4,324	4,942	5,560	6,178
80	71	141	212	282	353	706	1,412	2,118	2,824	3,530	4,236	4,942	5,648	6,354	7,060
90	79	159	238	318	397	794	1,589	2,383	3,177	3,971	4,766	5,560	6,354	7,149	7,943
100	88	177	265	353	441	883	1,765	2,648	3,530	4,413	5,295	6,178	7,060	7,943	8,825

Table 6. FC SPA gannet feature apportioned abundance totals when considering Natural England's approach to assessment of Hornsea Four.

Project	Breeding	Autumn	Spring	Annual	Tier
Beatrice	0	0	0	0	1a
Blyth Demonstration Site	-	-	-	-	1a
Dudgeon	53	1	1	55	1a
EOWDC	0	0	0	0	1a
Galloper	0	44	17	61	1a
Greater Gabbard	0	3	7	10	1a
Gunfleet Sands	0	1	1	1	1a
Humber Gateway	-	-	-	-	1a
Hywind 2 Demonstration	0	0	0	0	1a
Kentish Flats	-	-	-	-	1a
Kentish Flats Extension	0	1	0	1	1a
Lincs	-	-	-	-	1a
London Array	-	-	-	-	1a
Lynn and Inner Dowsing	-	-	-	-	1a
Methil	0	0	0	0	1a
Race Bank	92	2	2	95	1a
Rampion	0	28	0	28	1a
Scroby Sands	-	-	-	-	1a
Sheringham Shoal	47	2	0	49	1a
Teesside	1	0	0	1	1a
Thanet	-	-	-	-	1a
Westermost Rough	-	-	-	-	1a
East Anglia One	161	175	5	340	1b
Hornsea Project One	671	33	16	720	1b
Hornsea Project Two	457	55	8	519	1b
Moray East	0	14	2	16	1b
Triton Knoll	211	1	2	213	1b
Kincardine	0	0	0	0	1b
Dogger Bank A	259	44	11	314	1c
Dogger Bank B	319	54	14	386	1c
Dogger Bank C	484	18	14	516	1c
East Anglia Three	412	61	33	505	1c
Inch Cape	0	34	13	47	1c
Moray West	0	21	9	30	1c
Neart na Gaoithe	0	27	17	44	1c
Seagreen Alpha	0	14	9	23	1c
Seagreen Bravo	0	18	12	30	1c
Sofia	641	24	15	680	1c
Hornsea Three	844	47	33	924	1c
Norfolk Boreas	1,229	83	33	1,344	1c
Norfolk Vanguard	271	118	27	416	1c
East Anglia ONE North	149	23	3	174	1c
East Anglia TWO	192	43	12	247	1c

Project	Breeding	Autumn	Spring	Annual	Tier
Total (Consented Projects Only)	**6,492**	**986**	**311**	**7,789**	
Hornsea Four (Natural England's Approach)	883	38	25	946	1d
Total (Hornsea Four plus all consented projects only)	**7,375**	**1,024**	**336**	**8,735**	
Dudgeon Extension Project	319	15	3	337	2
Sheringham Shoal Extension Project	18	13	1	32	2
Rampion 2	0	4	3	7	2
Total (All Projects)	**7,712**	**1,056**	**343**	**9,111**	

Table 7. FFC SPA gannet feature annual displacement matrix when considering Natural England's approach to assessment of Hornsea Four in-combination with all consented projects only.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	2	3	3	4	9	17	26	35	44	52	61	70	79	87
10	9	17	26	35	44	87	175	262	349	437	524	611	699	786	874
20	17	35	52	70	87	175	349	524	699	874	1,048	1,223	1,398	1,572	1,747
30	26	52	79	105	131	262	524	786	1,048	1,310	1,572	1,834	2,096	2,359	2,621
40	35	70	105	140	175	349	699	1,048	1,398	1,747	2,096	2,446	2,795	3,145	3,494
50	44	87	131	175	218	437	874	1,310	1,747	2,184	2,621	3,057	3,494	3,931	4,368
60	52	105	157	210	262	524	1,048	1,572	2,096	2,621	3,145	3,669	4,193	4,717	5,241
70	61	122	183	245	306	611	1,223	1,834	2,446	3,057	3,669	4,280	4,892	5,503	6,115
80	70	140	210	280	349	699	1,398	2,096	2,795	3,494	4,193	4,892	5,591	6,289	6,988
90	79	157	236	314	393	786	1,572	2,359	3,145	3,931	4,717	5,503	6,289	7,076	7,862
100	87	175	262	349	437	874	1,747	2,621	3,494	4,368	5,241	6,115	6,988	7,862	8,735

Table 8. FFC SPA gannet feature annual displacement matrix when considering Natural England's approach to assessment of Hornsea Four in-combination with all projects.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	2	3	4	5	9	18	27	36	46	55	64	73	82	91
10	9	18	27	36	46	91	182	273	364	456	547	638	729	820	911
20	18	36	55	73	91	182	364	547	729	911	1,093	1,276	1,458	1,640	1,822
30	27	55	82	109	137	273	547	820	1,093	1,367	1,640	1,913	2,187	2,460	2,733
40	36	73	109	146	182	364	729	1,093	1,458	1,822	2,187	2,551	2,916	3,280	3,644
50	46	91	137	182	228	456	911	1,367	1,822	2,278	2,733	3,189	3,644	4,100	4,556
60	55	109	164	219	273	547	1,093	1,640	2,187	2,733	3,280	3,827	4,373	4,920	5,467
70	64	128	191	255	319	638	1,276	1,913	2,551	3,189	3,827	4,464	5,102	5,740	6,378
80	73	146	219	292	364	729	1,458	2,187	2,916	3,644	4,373	5,102	5,831	6,560	7,289
90	82	164	246	328	410	820	1,640	2,460	3,280	4,100	4,920	5,740	6,560	7,380	8,200
100	91	182	273	364	456	911	1,822	2,733	3,644	4,556	5,467	6,378	7,289	8,200	9,111

Kittiwake Collision Risk In-combination Totals

Table 9. FFC SPA kittiwake feature apportioned collision risk in-combination when considering the Applicant's approach to assessment of Hornsea Four.

Project	Breeding	Autumn	Spring	Annual	Tier
Beatrice	0.0	0.6	2.9	3.5	1a
Blyth Demonstration Site	0.0	0.1	0.1	0.2	1a
Dudgeon	-	-	-	-	1a
East Anglia One	0.0	8.7	3.4	12.0	1a
EOWDC	0.0	0.3	0.1	0.4	1a
Galloper	0.0	1.5	2.3	3.8	1a
Greater Gabbard	0.0	0.8	0.8	1.6	1a
Gunfleet Sands	-	-	-	-	1a
Hornsea Project One	36.5	3.0	1.5	41.0	1a
Humber Gateway	1.9	0.2	0.1	2.2	1a
Hywind 2 Demonstration	0.0	0.1	0.1	0.1	1a
Kentish Flats	0.0	0.1	0.1	0.1	1a
Kentish Flats Extension	0.0	0.0	0.2	0.2	1a
Kincardine	0.0	0.5	0.1	0.6	1a
Lincs, Lynn & Inner Dowsing	0.7	0.1	0.1	0.8	1a
London Array	0.0	0.1	0.1	0.3	1a
Methil	0.0	0.0	0.0	0.0	1a
Race Bank	1.9	1.3	0.4	3.6	1a
Rampion	0.0	2.0	2.1	4.2	1a
Scroby Sands	-	-	-	-	1a
Sheringham Shoal	-	-	-	-	1a
Teesside	0.0	1.3	0.2	1.5	1a
Thanet	0.0	0.0	0.0	0.1	1a
Westermost Rough	0.1	0.0	0.0	0.1	1a
Hornsea Project Two	13.3	0.5	0.2	14.0	1b
Moray East	0.0	0.1	1.4	1.5	1b
Neart na Gaoithe	0.0	3.0	0.3	3.4	1b
Seagreen Alpha & Bravo	0.0	16.9	17.8	34.7	1b
Triton Knoll	24.6	7.5	3.3	35.4	1b
Dogger Bank A & B	55.8	7.3	21.3	84.3	1c
Dogger Bank C & Sofia	26.4	4.9	15.6	46.9	1c
East Anglia Three	0.0	3.7	2.7	6.4	1c
Hornsea Three	0.0 (72.0)	0.0 (2.0)	0.0 (1.0)	0.0 (75.0)	1c
Inch Cape	0.0	12.1	4.6	16.7	1c
Moray West	0.0	1.3	0.5	1.8	1c
Norfolk Boreas	0.0 (11.4)	0.0 (1.7)	0.0 (0.9)	0.0 (14.0)	1c
Norfolk Vanguard	0.0 (18.7)	0.0 (0.9)	0.0 (1.4)	0.0 (21.0)	1c
East Anglia ONE North	0.0 (0.0)	0.0 (0.4)	0.0 (0.3)	0.0 (0.7)	1c

Project	Breeding	Autumn	Spring	Annual	Tier
East Anglia TWO	0.0 (0.0)	0.0 (0.3)	0.0 (0.5)	0.0 (0.8)	1c
Total (Consented Projects Only)	**161.2 (263.3)**	**78.0 (83.3)**	**82.3 (86.4)**	**321.4 (432.9)**	
Hornsea Four (Applicant's Approach)	0.0 (20.6)	0.0 (1.7)	0.0 (1.0)	0.0 (23.3)	1d
Total (Hornsea Four plus all consented projects only)	**161.2 (283.9)**	**78.0 (85.0)**	**82.3 (87.4)**	**321.5 (456.2)**	
Dudgeon Extension Project	7.6	0.3	0.1	8.1	1d
Sheringham Shoal Extension Project	0.7	0.1	0.0	0.8	1d
Rampion 2	0.0	0.1	0.5	0.6	2
Total (All Projects)	**169.5 (292.2)**	**78.5 (85.5)**	**82.9 (88.0)**	**331.0 (465.7)**	

Table note: * In-combination impact contribution set as zero due to the project committing to compensating for the projects level of predicted impact, which is provided in parentheses for reference.

Table 10. FFC SPA kittiwake apportioned collision risk in-combination totals when considering Natural England's approach to assessment of Hornsea Four.

Project	Breeding	Autumn	Spring	Annual	Tier
Beatrice	0.0	0.6	2.9	3.5	1a
Blyth Demonstration Site	0.0	0.1	0.1	0.2	1a
Dudgeon	-	-	-	-	1a
East Anglia One	0.0	8.7	3.4	12.0	1a
EOWDC	0.0	0.3	0.1	0.4	1a
Galloper	0.0	1.5	2.3	3.8	1a
Greater Gabbard	0.0	0.8	0.8	1.6	1a
Gunfleet Sands	-	-	-	-	1a
Hornsea Project One	36.5	3.0	1.5	41.0	1a
Humber Gateway	1.9	0.2	0.1	2.2	1a
Hywind 2 Demonstration	0.0	0.1	0.1	0.1	1a
Kentish Flats	0.0	0.1	0.1	0.1	1a
Kentish Flats Extension	0.0	0.0	0.2	0.2	1a
Kincardine	0.0	0.5	0.1	0.6	1a
Lincs, Lynn & Inner Dowsing	0.7	0.1	0.1	0.8	1a
London Array	0.0	0.1	0.1	0.3	1a
Methil	0.0	0.0	0.0	0.0	1a
Race Bank	1.9	1.3	0.4	3.6	1a
Rampion	0.0	2.0	2.1	4.2	1a
Scroby Sands	-	-	-	-	1a
Sheringham Shoal	-	-	-	-	1a
Teesside	0.0	1.3	0.2	1.5	1a
Thanet	0.0	0.0	0.0	0.1	1a
Westermost Rough	0.1	0.0	0.0	0.1	1a
Hornsea Project Two	13.3	0.5	0.2	14.0	1b
Moray East	0.0	0.1	1.4	1.5	1b
Neart na Gaoithe	0.0	3.0	0.3	3.4	1b
Seagreen Alpha & Bravo	0.0	16.9	17.8	34.7	1b
Triton Knoll	24.6	7.5	3.3	35.4	1b
Dogger Bank A & B	55.8	7.3	21.3	84.3	1c
Dogger Bank C & Sofia	26.4	4.9	15.6	46.9	1c
East Anglia Three	0.0	3.7	2.7	6.4	1c
Hornsea Three*	0.0 (72.0)	0.0 (2.0)	0.0 (1.0)	0.0 (75.0)	1c
Inch Cape	0.0	12.1	4.6	16.7	1c
Moray West	0.0	1.3	0.5	1.8	1c
Norfolk Boreas*	0.0 (11.4)	0.0 (1.7)	0.0 (0.9)	0.0 (14.0)	1c
Norfolk Vanguard*	0.0 (18.7)	0.0 (0.9)	0.0 (1.4)	0.0 (21.0)	1c
East Anglia ONE North*	0.0 (0.0)	0.0 (0.4)	0.0 (0.3)	0.0 (0.7)	1c
East Anglia TWO*	0.0 (0.0)	0.0 (0.3)	0.0 (0.5)	0.0 (0.8)	1c

Project	Breeding	Autumn	Spring	Annual	Tier
Total (Consented Projects Only)	**161.2 (263.3)**	**78.0 (83.3)**	**82.3 (86.4)**	**321.4 (432.9)**	
Hornsea Four (Natural England's Approach) *	0.0 (70.3)	0.0 (0.8)	0.0 (0.3)	0.0 (71.4)	1d
Total (Hornsea Four plus all consented projects only)	**161.2 (333.6)**	**78.0 (84.1)**	**82.3 (86.7)**	**321.5 (504.3)**	
Dudgeon Extension Project	7.6	0.3	0.1	8.1	1d
Sheringham Shoal Extension Project	0.7	0.1	0.0	0.8	1d
Rampion 2	0.0	0.1	0.5	0.6	2
Total (All Projects)	**169.5 (341.9)**	**78.5 (84.6)**	**82.9 (87.3)**	**331.0 (513.8)**	

Table note: * In-combination impact contribution set as zero due to the project committing to compensating for the projects level of predicted impact, which is provided in parentheses for reference.

Guillemot Displacement In-combination Totals

Table 11. FFC SPA guillemot feature apportioned abundance totals when considering the Applicant's approach to assessment of Hornsea Four.

Project	Breeding	Non-breeding	Annual	Tier
Beatrice	0	121	121	1a
Blyth Demonstration Site	0	58	58	1a
Dudgeon	0	24	24	1a
EOWDC	0	10	10	1a
Galloper	0	26	26	1a
Greater Gabbard	0	24	24	1a
Gunfleet Sands	0	16	16	1a
Humber Gateway	99	6	105	1a
Hywind 2 Demonstration	0	94	94	1a
Kentish Flats Extension	0	0	0	1a
Kentish Flats	0	0	0	1a
Lincs, Lynn & Inner Dowsing	0	36	36	1a
London Array	0	17	17	1a
Methil	0	0	0	1a
Race Bank	0	31	31	1a
Rampion	0	684	684	1a
Scroby Sands	-	-	-	1a
Sheringham Shoal	0	32	32	1a
Teesside	267	40	307	1a
Thanet	0	6	6	1a
Westermost Rough	347	21	368	1a
East Anglia One	0	28	28	1b
Hornsea Project One**	4,554	356	4,910	1b
Hornsea Project Two**	3,581	579	4,161	1b
Moray East	0	24	24	1b
Triton Knoll	425	33	458	1b
Kincardine	0	0	0	1b
Dogger Bank A**	1,893	270	2,163	1c
Dogger Bank B**	3,318	467	3,785	1c
Dogger Bank C**	1,149	100	1,249	1c
East Anglia Three	0	126	126	1c
Inch Cape	0	140	140	1c
Moray West	0	1,680	1,680	1c
Neart na Gaoithe	0	166	166	1c
Seagreen Alpha	0	206	206	1c

Project	Breeding	Non-breeding	Annual	Tier
Seagreen Bravo	0	181	181	1c
Sofia**	1,824	163	1,987	1c
Hornsea Three*	0	782	782	1c
Norfolk Boreas	0	606	606	1c
Norfolk Vanguard	0	210	210	1c
East Anglia ONE North	0	83	83	1c
East Anglia TWO	0	74	74	1c
Total (Consented Projects Only)	**17,457**	**7,519**	**24,975**	
Hornsea Four (Applicant's Approach)	5,235	2,666	7,901	1d
Total (Hornsea Four plus all consented projects only)	**22,692**	**10,185**	**32,876**	
Dudgeon Extension Project	0	655	655	1d
Sheringham Shoal Extension Project	0	48	48	1d
Rampion 2	0	574	574	2
Total (All Projects)	**22,692**	**11,461**	**34,153**	

Table note: *Reduction of 8,502 breeding adults apportioned per annum than previously included for assessment within the **G5.25 Ornithology EIA and HRA Annex** (**REP6-028**), as advised by Natural England (**REP7-104**). ** Project also outside of the mean max plus 1 Standard Deviation (SD) foraging range, therefore logically project should also have an apportioned impact of zero during the breeding season.

Table 12. FFC SPA guillemot feature annual displacement matrix when considering the Applicant's approach to assessment of Hornsea Four in-combination with all consented projects only.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	3	7	10	13	16	33	66	99	132	164	197	230	263	296	329
10	33	66	99	132	164	329	658	986	1,315	1,644	1,973	2,301	2,630	2,959	3,288
20	66	132	197	263	329	658	1,315	1,973	2,630	3,288	3,945	4,603	5,260	5,918	6,575
30	99	197	296	395	493	986	1,973	2,959	3,945	4,931	5,918	6,904	7,890	8,877	9,863
40	132	263	395	526	658	1,315	2,630	3,945	5,260	6,575	7,890	9,205	10,520	11,835	13,150
50	164	329	493	658	822	1,644	3,288	4,931	6,575	8,219	9,863	11,507	13,150	14,794	16,438
60	197	395	592	789	986	1,973	3,945	5,918	7,890	9,863	11,835	13,808	15,781	17,753	19,726
70	230	460	690	921	1,151	2,301	4,603	6,904	9,205	11,507	13,808	16,109	18,411	20,712	23,013
80	263	526	789	1,052	1,315	2,630	5,260	7,890	10,520	13,150	15,781	18,411	21,041	23,671	26,301
90	296	592	888	1,184	1,479	2,959	5,918	8,877	11,835	14,794	17,753	20,712	23,671	26,630	29,589
100	329	658	986	1,315	1,644	3,288	6,575	9,863	13,150	16,438	19,726	23,013	26,301	29,589	32,876

Table 13. FFC SPA guillemot feature annual displacement matrix when considering the Applicant's approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	3	7	10	14	17	34	68	102	137	171	205	239	273	307	342
10	34	68	102	137	171	342	683	1,025	1,366	1,708	2,049	2,391	2,732	3,074	3,415
20	68	137	205	273	342	683	1,366	2,049	2,732	3,415	4,098	4,781	5,464	6,148	6,831
30	102	205	307	410	512	1,025	2,049	3,074	4,098	5,123	6,148	7,172	8,197	9,221	10,246
40	137	273	410	546	683	1,366	2,732	4,098	5,464	6,831	8,197	9,563	10,929	12,295	13,661
50	171	342	512	683	854	1,708	3,415	5,123	6,831	8,538	10,246	11,954	13,661	15,369	17,076
60	205	410	615	820	1,025	2,049	4,098	6,148	8,197	10,246	12,295	14,344	16,393	18,443	20,492
70	239	478	717	956	1,195	2,391	4,781	7,172	9,563	11,954	14,344	16,735	19,126	21,516	23,907
80	273	546	820	1,093	1,366	2,732	5,464	8,197	10,929	13,661	16,393	19,126	21,858	24,590	27,322
90	307	615	922	1,230	1,537	3,074	6,148	9,221	12,295	15,369	18,443	21,516	24,590	27,664	30,738
100	342	683	1,025	1,366	1,708	3,415	6,831	10,246	13,661	17,076	20,492	23,907	27,322	30,738	34,153

Table 14. FFC SPA guillemot feature apportioned abundance totals when considering Natural England's standard approach to assessment of Hornsea Four.

Project	Breeding	Non-breeding	Annual	Tier
Beatrice	0	121	121	1a
Blyth Demonstration Site	0	58	58	1a
Dudgeon	0	24	24	1a
EOWDC	0	10	10	1a
Galloper	0	26	26	1a
Greater Gabbard	0	24	24	1a
Gunfleet Sands	0	16	16	1a
Humber Gateway	99	6	105	1a
Hywind 2 Demonstration	0	94	94	1a
Kentish Flats Extension	0	0	0	1a
Kentish Flats	0	0	0	1a
Lincs, Lynn & Inner Dowsing	0	36	36	1a
London Array	0	17	17	1a
Methil	0	0	0	1a
Race Bank	0	31	31	1a
Rampion	0	684	684	1a
Scroby Sands	-	-	-	1a
Sheringham Shoal	0	32	32	1a
Teesside	267	40	307	1a
Thanet	0	6	6	1a
Westermost Rough	347	21	368	1a
East Anglia One	0	28	28	1b
Hornsea Project One**	4,554	356	4,910	1b
Hornsea Project Two**	3,581	579	4,161	1b
Moray East	0	24	24	1b
Triton Knoll	425	33	458	1b
Kincardine	0	0	0	1b
Dogger Bank A**	1,893	270	2,163	1c
Dogger Bank B**	3,318	467	3,785	1c
Dogger Bank C**	1,149	100	1,249	1c
East Anglia Three	0	126	126	1c
Inch Cape	0	140	140	1c
Moray West	0	1,680	1,680	1c
Neart na Gaoithe	0	166	166	1c
Seagreen Alpha	0	206	206	1c
Seagreen Bravo	0	181	181	1c
Sofia**	1,824	163	1,987	1c
Hornsea Three*	0	782	782	1c
Norfolk Boreas	0	606	606	1c
Norfolk Vanguard	0	210	210	1c
East Anglia ONE North	0	83	83	1c
East Anglia TWO	0	74	74	1c

Project	Breeding	Non-breeding	Annual	Tier
Total (Consented Projects Only)	**17,457**	**7,519**	**24,975**	
Hornsea Four (Natural England's Standard Approach)	9,382	1,631	11,013	1d
Total (Hornsea Four plus all consented projects only)	**26,838**	**9,150**	**35,988**	
Dudgeon Extension Project	0	655	655	1d
Sheringham Shoal Extension Project	0	48	48	1d
Rampion 2	0	574	574	2
Total (All Projects)	**26,838**	**10,426**	**37,265**	

Table note: *Reduction of 8,502 breeding adults apportioned per annum than previously included for assessment within the **G5.25 Ornithology EIA and HRA Annex** (**REP6-028**), as advised by Natural England (**REP7-104**). ** Project also outside of the mean max plus 1 SD foraging range, therefore logically project should also have an apportioned impact of zero during the breeding season.

Table 15. FFC SPA guillemot feature annual displacement matrix when considering Natural England's approach to assessment of Hornsea Four in-combination with all consented projects only.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4	7	11	14	18	36	72	108	144	180	216	252	288	324	360
10	36	72	108	144	180	360	720	1,080	1,440	1,799	2,159	2,519	2,879	3,239	3,599
20	72	144	216	288	360	720	1,440	2,159	2,879	3,599	4,319	5,038	5,758	6,478	7,198
30	108	216	324	432	540	1,080	2,159	3,239	4,319	5,398	6,478	7,557	8,637	9,717	10,796
40	144	288	432	576	720	1,440	2,879	4,319	5,758	7,198	8,637	10,077	11,516	12,956	14,395
50	180	360	540	720	900	1,799	3,599	5,398	7,198	8,997	10,796	12,596	14,395	16,195	17,994
60	216	432	648	864	1,080	2,159	4,319	6,478	8,637	10,796	12,956	15,115	17,274	19,434	21,593
70	252	504	756	1,008	1,260	2,519	5,038	7,557	10,077	12,596	15,115	17,634	20,153	22,672	25,192
80	288	576	864	1,152	1,440	2,879	5,758	8,637	11,516	14,395	17,274	20,153	23,032	25,911	28,790
90	324	648	972	1,296	1,619	3,239	6,478	9,717	12,956	16,195	19,434	22,672	25,911	29,150	32,389
100	360	720	1,080	1,440	1,799	3,599	7,198	10,796	14,395	17,994	21,593	25,192	28,790	32,389	35,988

Table 16. FFC SPA guillemot feature annual displacement matrix when considering Natural England's approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	4	7	11	15	19	37	75	112	149	186	224	261	298	335	373
10	37	75	112	149	186	373	745	1,118	1,491	1,863	2,236	2,609	2,981	3,354	3,726
20	75	149	224	298	373	745	1,491	2,236	2,981	3,726	4,472	5,217	5,962	6,708	7,453
30	112	224	335	447	559	1,118	2,236	3,354	4,472	5,590	6,708	7,826	8,944	10,061	11,179
40	149	298	447	596	745	1,491	2,981	4,472	5,962	7,453	8,944	10,434	11,925	13,415	14,906
50	186	373	559	745	932	1,863	3,726	5,590	7,453	9,316	11,179	13,043	14,906	16,769	18,632
60	224	447	671	894	1,118	2,236	4,472	6,708	8,944	11,179	13,415	15,651	17,887	20,123	22,359
70	261	522	783	1,043	1,304	2,609	5,217	7,826	10,434	13,043	15,651	18,260	20,868	23,477	26,085
80	298	596	894	1,192	1,491	2,981	5,962	8,944	11,925	14,906	17,887	20,868	23,849	26,831	29,812
90	335	671	1,006	1,342	1,677	3,354	6,708	10,061	13,415	16,769	20,123	23,477	26,831	30,184	33,538
100	373	745	1,118	1,491	1,863	3,726	7,453	11,179	14,906	18,632	22,359	26,085	29,812	33,538	37,265

Table 17. FFC SPA guillemot feature apportioned abundance totals when considering Natural England's bespoke approach to assessment of Hornsea Four.

Project	Breeding	Chick Rearing/ moult period	Non-breeding	Annual	Tier
Beatrice	0	N/A	121	121	1a
Blyth Demonstration Site	0	N/A	58	58	1a
Dudgeon	0	N/A	24	24	1a
EOWDC	0	N/A	10	10	1a
Galloper	0	N/A	26	26	1a
Greater Gabbard	0	N/A	24	24	1a
Gunfleet Sands	0	N/A	16	16	1a
Humber Gateway	99	N/A	6	105	1a
Hywind 2 Demonstration	0	N/A	94	94	1a
Kentish Flats Extension	0	N/A	0	0	1a
Kentish Flats	0	N/A	0	0	1a
Lincs, Lynn & Inner Dowsing	0	N/A	36	36	1a
London Array	0	N/A	17	17	1a
Methil	0	N/A	0	0	1a
Race Bank	0	N/A	31	31	1a
Rampion	0	N/A	684	684	1a
Scroby Sands	-	N/A	-	-	1a
Sheringham Shoal	0	N/A	32	32	1a
Teesside	267	N/A	40	307	1a
Thanet	0	N/A	6	6	1a
Westermost Rough	347	N/A	21	368	1a
East Anglia One	0	N/A	28	28	1b
Hornsea Project One**	4,554	N/A	356	4,910	1b
Hornsea Project Two**	3,581	N/A	579	4,161	1b
Moray East	0	N/A	24	24	1b
Triton Knoll	425	N/A	33	458	1b
Kincardine	0	N/A	0	0	1b
Dogger Bank A**	1,893	N/A	270	2,163	1c
Dogger Bank B**	3,318	N/A	467	3,785	1c
Dogger Bank C**	1,149	N/A	100	1,249	1c
East Anglia Three	0	N/A	126	126	1c
Inch Cape	0	N/A	140	140	1c
Moray West	0	N/A	1,680	1,680	1c
Neart na Gaoithe	0	N/A	166	166	1c
Seagreen Alpha	0	N/A	206	206	1c
Seagreen Bravo	0	N/A	181	181	1c
Sofia**	1,824	N/A	163	1,987	1c
Hornsea Three*	0	N/A	782	782	1c
Norfolk Boreas	0	N/A	606	606	1c
Norfolk Vanguard	0	N/A	210	210	1c

Project	Breeding	Chick Rearing/ moult period	Non-breeding	Annual	Tier
East Anglia ONE North	0	N/A	83	83	1c
East Anglia TWO	0	N/A	74	74	1c
Total (Consented Projects Only)	**17,457**	**0**	**7,519**	**24,975**	
Hornsea Four (Natural England's Bespoke Approach)	9,382	22,179	748	32,309	1d
Total (Hornsea Four plus all consented projects only)	**26,838**	**22,179**	**8,267**	**57,284**	
Dudgeon Extension Project	0	N/A	655	655	1d
Sheringham Shoal Extension Project	0	N/A	48	48	1d
Rampion 2	0	N/A	574	574	2
Total (All Projects)	**26,838**	**22,179**	**9,543**	**58,561**	

Table note: *Reduction of 8,502 breeding adults apportioned per annum than previously included for assessment within the **G5.25 Ornithology EIA and HRA Annex** (**REP6-028**), as advised by Natural England (**REP7-104**). ** Project also outside of the mean max plus 1 SD foraging range, therefore logically project should also have an apportioned impact of zero during the breeding season.

Table 18. FFC SPA guillemot feature annual displacement matrix when considering Natural England's approach to assessment of Hornsea Four in-combination with all consented projects only.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	6	11	17	23	29	57	115	172	229	286	344	401	458	516	573
10	57	115	172	229	286	573	1,146	1,719	2,291	2,864	3,437	4,010	4,583	5,156	5,728
20	115	229	344	458	573	1,146	2,291	3,437	4,583	5,728	6,874	8,020	9,165	10,311	11,457
30	172	344	516	687	859	1,719	3,437	5,156	6,874	8,593	10,311	12,030	13,748	15,467	17,185
40	229	458	687	917	1,146	2,291	4,583	6,874	9,165	11,457	13,748	16,040	18,331	20,622	22,914
50	286	573	859	1,146	1,432	2,864	5,728	8,593	11,457	14,321	17,185	20,049	22,914	25,778	28,642
60	344	687	1,031	1,375	1,719	3,437	6,874	10,311	13,748	17,185	20,622	24,059	27,496	30,934	34,371
70	401	802	1,203	1,604	2,005	4,010	8,020	12,030	16,040	20,049	24,059	28,069	32,079	36,089	40,099
80	458	917	1,375	1,833	2,291	4,583	9,165	13,748	18,331	22,914	27,496	32,079	36,662	41,245	45,827
90	516	1,031	1,547	2,062	2,578	5,156	10,311	15,467	20,622	25,778	30,934	36,089	41,245	46,400	51,556
100	573	1,146	1,719	2,291	2,864	5,728	11,457	17,185	22,914	28,642	34,371	40,099	45,827	51,556	57,284

Table 19. FFC SPA guillemot feature annual displacement matrix when considering Natural England's approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	6	12	18	23	29	59	117	176	234	293	351	410	468	527	586
10	59	117	176	234	293	586	1,171	1,757	2,342	2,928	3,514	4,099	4,685	5,270	5,856
20	117	234	351	468	586	1,171	2,342	3,514	4,685	5,856	7,027	8,199	9,370	10,541	11,712
30	176	351	527	703	878	1,757	3,514	5,270	7,027	8,784	10,541	12,298	14,055	15,811	17,568
40	234	468	703	937	1,171	2,342	4,685	7,027	9,370	11,712	14,055	16,397	18,740	21,082	23,424
50	293	586	878	1,171	1,464	2,928	5,856	8,784	11,712	14,640	17,568	20,496	23,424	26,352	29,280
60	351	703	1,054	1,405	1,757	3,514	7,027	10,541	14,055	17,568	21,082	24,596	28,109	31,623	35,137
70	410	820	1,230	1,640	2,050	4,099	8,199	12,298	16,397	20,496	24,596	28,695	32,794	36,893	40,993
80	468	937	1,405	1,874	2,342	4,685	9,370	14,055	18,740	23,424	28,109	32,794	37,479	42,164	46,849
90	527	1,054	1,581	2,108	2,635	5,270	10,541	15,811	21,082	26,352	31,623	36,893	42,164	47,434	52,705
100	586	1,171	1,757	2,342	2,928	5,856	11,712	17,568	23,424	29,280	35,137	40,993	46,849	52,705	58,561

Razorbill Displacement In-combination Totals

Table 20. FFC SPA razorbill feature apportioned abundance totals when considering the Applicant's approach to assessment of Hornsea Four.

Project	Breeding	Autumn	Winter	Spring	Annual Total	Tier
Beatrice	0	28	15	28	72	1a
Blyth Demonstration Site	0	3	2	3	8	1a
Dudgeon	0	12	20	12	44	1a
EOWDC	0	2	0	1	3	1a
Galloper	0	2	3	13	18	1a
Greater Gabbard	0	0	11	3	13	1a
Gunfleet Sands	0	0	1	0	1	1a
Humber Gateway	0	1	0	1	2	1a
Hywind 2 Demonstration	0	24	0		25	1a
Kentish Flats	-	-	-	-	-	1a
Kentish Flats Extension	-	-	-	-	-	1a
Lincs, Lynn & Inner Dowsing	0	1	1	1	3	1a
London Array	0	1	0	1	2	1a
Methil	0	0	0	0	0	1a
Race Bank	0	1	1	1	4	1a
Rampion	0	2	34	113	149	1a
Scroby Sands	-	-	-	-	-	1a
Sheringham Shoal	0	46	6	1	52	1a
Teesside	0	2	0	1	3	1a
Thanet	0	0	0	1	1	1a
Westermost Rough	91	4	4	3	102	1a
East Anglia One	0	1	4	11	17	1b
Hornsea Project One**	535	164	41	61	800	1b
Hornsea Project Two	1,210	144	19	57	1,430	1b
Moray East	0	38	1	6	44	1b
Triton Knoll	0	9	23	4	36	1b
Kincardine	0	0	0	0	0	1b
Dogger Bank A**	375	54	47	141	616	1c
Dogger Bank B**	461	71	58	174	765	1c
Dogger Bank C**	250	11	26	65	352	1c
East Anglia Three	0	38	41	52	130	1c
Inch Cape	0	98	18	-	115	1c
Moray West	0	121	5	122	247	1c
Neart na Gaoithe	0	187	14	-	200	1c
Seagreen Alpha	0	0	30	-	30	1c

Project	Breeding	Autumn	Winter	Spring	Annual Total	Tier
Seagreen Bravo	0	0	34	-	34	1c
Sofia	346	20	39	100	505	1c
Hornsea Three*	0	69	99	72	240	1c
Norfolk Boreas	0	9	29	12	49	1c
Norfolk Vanguard	0	30	23	31	84	1c
East Anglia ONE North	0	3	2	7	11	1c
East Anglia TWO	0	2	4	8	13	1c
Total (Consented Projects Only)	**3,268**	**1,194**	**652**	**1,106**	**6,220**	
Hornsea Four (Applicant's Approach)	215	146	12	15	388	1d
Total (Hornsea Four plus all consented projects only)	**3,483**	**1,339**	**664**	**1,121**	**6,608**	
Dudgeon Extension Project	0	31	23	11	69	1d
Sheringham Shoal Extension Project	0	11	19	5	38	1d
Rampion 2	0	1	1	72	74	2
Total (All Projects)	**3,483**	**1,382**	**706**	**1,209**	**6,789**	

Table note: *Reduction of 516 breeding adults apportioned per annum than previously included for assessment within the **G5.25 Ornithology EIA and HRA Annex** (**REP6-028**), as advised by Natural England (**REP7-104**). ** Project also outside of the mean max plus 1 SD foraging range, therefore logically project should also have an apportioned impact of zero during the breeding season.

Table 21. FFC SPA razorbill feature annual displacement matrix when considering the Applicant's approach to assessment of Hornsea Four in-combination with all consented projects only.

Displacement (%)	1	2	3	4	5	10	20	30.	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	2	3	3	7	13	20	26	33	40	46	53	59	66
10	7	13	20	26	33	66	132	198	264	330	396	463	529	595	661
20	13	26	40	53	66	132	264	396	529	661	793	925	1,057	1,189	1,322
30	20	40	59	79	99	198	396	595	793	991	1,189	1,388	1,586	1,784	1,982
40	26	53	79	106	132	264	529	793	1,057	1,322	1,586	1,850	2,115	2,379	2,643
50	33	66	99	132	165	330	661	991	1,322	1,652	1,982	2,313	2,643	2,974	3,304
60	40	79	119	159	198	396	793	1,189	1,586	1,982	2,379	2,775	3,172	3,568	3,965
70	46	93	139	185	231	463	925	1,388	1,850	2,313	2,775	3,238	3,700	4,163	4,626
80	53	106	159	211	264	529	1,057	1,586	2,115	2,643	3,172	3,700	4,229	4,758	5,286
90	59	119	178	238	297	595	1,189	1,784	2,379	2,974	3,568	4,163	4,758	5,352	5,947
100	66	132	198	264	330	661	1,322	1,982	2,643	3,304	3,965	4,626	5,286	5,947	6,608

Table 22. FFC SPA razorbill feature annual displacement matrix when considering the Applicant's approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	2	3	3	7	14	20	27	34	41	48	54	61	68
10	7	14	20	27	34	68	136	204	272	339	407	475	543	611	679
20	14	27	41	54	68	136	272	407	543	679	815	950	1,086	1,222	1,358
30	20	41	61	81	102	204	407	611	815	1,018	1,222	1,426	1,629	1,833	2,037
40	27	54	81	109	136	272	543	815	1,086	1,358	1,629	1,901	2,172	2,444	2,715
50	34	68	102	136	170	339	679	1,018	1,358	1,697	2,037	2,376	2,715	3,055	3,394
60	41	81	122	163	204	407	815	1,222	1,629	2,037	2,444	2,851	3,259	3,666	4,073
70	48	95	143	190	238	475	950	1,426	1,901	2,376	2,851	3,326	3,802	4,277	4,752
80	54	109	163	217	272	543	1,086	1,629	2,172	2,715	3,259	3,802	4,345	4,888	5,431
90	61	122	183	244	305	611	1,222	1,833	2,444	3,055	3,666	4,277	4,888	5,499	6,110
100	68	136	204	272	339	679	1,358	2,037	2,715	3,394	4,073	4,752	5,431	6,110	6,789

Table 23. FFC SPA razorbill feature apportioned abundance totals when considering Natural England's standard approach to assessment of Hornsea Four.

Project	Breeding	Autumn	Winter	Spring	Annual Total	Tier
Beatrice	0	28	15	28	72	1a
Blyth Demonstration Site	0	3	2	3	8	1a
Dudgeon	0	12	20	12	44	1a
EOWDC	0	2	0	1	3	1a
Galloper	0	2	3	13	18	1a
Greater Gabbard	0	0	11	3	13	1a
Gunfleet Sands	0	0	1	0	1	1a
Humber Gateway	0	1	0	1	2	1a
Hywind 2 Demonstration	0	24	0		25	1a
Kentish Flats	-	-	-	-	-	1a
Kentish Flats Extension	-	-	-	-	-	1a
Lincs, Lynn & Inner Dowsing	0	1	1	1	3	1a
London Array	0	1	0	1	2	1a
Methil	0	0	0	0	0	1a
Race Bank	0	1	1	1	4	1a
Rampion	0	2	34	113	149	1a
Scroby Sands	-	-	-	-	-	1a
Sheringham Shoal	0	46	6	1	52	1a
Teesside	0	2	0	1	3	1a
Thanet	0	0	0	1	1	1a
Westermost Rough	91	4	4	3	102	1a
East Anglia One	0	1	4	11	17	1b
Hornsea Project One**	535	164	41	61	800	1b
Hornsea Project Two	1,210	144	19	57	1,430	1b
Moray East	0	38	1	6	44	1b
Triton Knoll	0	9	23	4	36	1b
Kincardine	0	0	0	0	0	1b
Dogger Bank A**	375	54	47	141	616	1c
Dogger Bank B**	461	71	58	174	765	1c
Dogger Bank C**	250	11	26	65	352	1c
East Anglia Three	0	38	41	52	130	1c
Inch Cape	0	98	18	-	115	1c
Moray West	0	121	5	122	247	1c
Neart na Gaoithe	0	187	14	-	200	1c
Seagreen Alpha	0	0	30	-	30	1c
Seagreen Bravo	0	0	34	-	34	1c
Sofia	346	20	39	100	505	1c

Project	Breeding	Autumn	Winter	Spring	Annual Total	Tier
Hornsea Three*	0	69	99	72	240	1c
Norfolk Boreas	0	9	29	12	49	1c
Norfolk Vanguard	0	30	23	31	84	1c
East Anglia ONE North	0	3	2	7	11	1c
East Anglia TWO	0	2	4	8	13	1c
Total (Consented Projects Only)	**3,268**	**1,194**	**652**	**1,106**	**6,220**	
Hornsea Four (Natural England's Standard Approach)	386	146	12	15	559	1d
Total (Hornsea Four plus all consented projects only)	**3,654**	**1,340**	**664**	**1,121**	**6,779**	
Dudgeon Extension Project	0	31	23	11	69	1d
Sheringham Shoal Extension Project	0	11	19	5	38	1d
Rampion 2	0	1	1	72	74	2
Total (All Projects)	**3,654**	**1,383**	**706**	**1,209**	**6,959**	

Table note: *Reduction of 516 breeding adults apportioned per annum than previously included for assessment within the **G5.25 Ornithology EIA and HRA Annex** (**REP6-028**), as advised by Natural England (**REP7-104**). ** Project also outside of the mean max plus 1 SD foraging range, therefore logically project should also have an apportioned impact of zero during the breeding season.

Table 24. FFC SPA razorbill feature annual displacement matrix when considering Natural England's standard approach to assessment of Hornsea Four in-combination with all consented projects only.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	2	3	3	7	14	20	27	34	41	47	54	61	68
10	7	14	20	27	34	68	136	203	271	339	407	474	542	610	678
20	14	27	41	54	68	136	271	407	542	678	813	949	1,085	1,220	1,356
30	20	41	61	81	102	203	407	610	813	1,017	1,220	1,423	1,627	1,830	2,034
40	27	54	81	108	136	271	542	813	1,085	1,356	1,627	1,898	2,169	2,440	2,711
50	34	68	102	136	169	339	678	1,017	1,356	1,695	2,034	2,372	2,711	3,050	3,389
60	41	81	122	163	203	407	813	1,220	1,627	2,034	2,440	2,847	3,254	3,660	4,067
70	47	95	142	190	237	474	949	1,423	1,898	2,372	2,847	3,321	3,796	4,270	4,745
80	54	108	163	217	271	542	1,085	1,627	2,169	2,711	3,254	3,796	4,338	4,881	5,423
90	61	122	183	244	305	610	1,220	1,830	2,440	3,050	3,660	4,270	4,881	5,491	6,101
100	68	136	203	271	339	678	1,356	2,034	2,711	3,389	4,067	4,745	5,423	6,101	6,779

Table 25. FFC SPA razorbill feature annual displacement matrix when considering Natural England's standard approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	2	3	3	7	14	21	28	35	42	49	56	63	70
10	7	14	21	28	35	70	139	209	278	348	418	487	557	626	696
20	14	28	42	56	70	139	278	418	557	696	835	974	1,113	1,253	1,392
30	21	42	63	84	104	209	418	626	835	1,044	1,253	1,461	1,670	1,879	2,088
40	28	56	84	111	139	278	557	835	1,113	1,392	1,670	1,949	2,227	2,505	2,784
50	35	70	104	139	174	348	696	1,044	1,392	1,740	2,088	2,436	2,784	3,132	3,480
60	42	84	125	167	209	418	835	1,253	1,670	2,088	2,505	2,923	3,340	3,758	4,175
70	49	97	146	195	244	487	974	1,461	1,949	2,436	2,923	3,410	3,897	4,384	4,871
80	56	111	167	223	278	557	1,113	1,670	2,227	2,784	3,340	3,897	4,454	5,011	5,567
90	63	125	188	251	313	626	1,253	1,879	2,505	3,132	3,758	4,384	5,011	5,637	6,263
100	70	139	209	278	348	696	1,392	2,088	2,784	3,480	4,175	4,871	5,567	6,263	6,959

Table 26. FFC SPA razorbill feature apportioned abundance totals when considering Natural England's bespoke approach to assessment of Hornsea Four.

Project	Breeding	Autumn	Winter	Spring	Annual Total	Tier
Beatrice	0	28	15	28	72	1a
Blyth Demonstration Site	0	3	2	3	8	1a
Dudgeon	0	12	20	12	44	1a
EOWDC	0	2	0	1	3	1a
Galloper	0	2	3	13	18	1a
Greater Gabbard	0	0	11	3	13	1a
Gunfleet Sands	0	0	1	0	1	1a
Humber Gateway	0	1	0	1	2	1a
Hywind 2 Demonstration	0	24	0		25	1a
Kentish Flats	-	-	-	-	-	1a
Kentish Flats Extension	-	-	-	-	-	1a
Lincs, Lynn & Inner Dowsing	0	1	1	1	3	1a
London Array	0	1	0	1	2	1a
Methil	0	0	0	0	0	1a
Race Bank	0	1	1	1	4	1a
Rampion	0	2	34	113	149	1a
Scroby Sands	-	-	-	-	-	1a
Sheringham Shoal	0	46	6	1	52	1a
Teesside	0	2	0	1	3	1a
Thanet	0	0	0	1	1	1a
Westermost Rough	91	4	4	3	102	1a
East Anglia One	0	1	4	11	17	1b
Hornsea Project One**	535	164	41	61	800	1b
Hornsea Project Two	1,210	144	19	57	1,430	1b
Moray East	0	38	1	6	44	1b
Triton Knoll	0	9	23	4	36	1b
Kincardine	0	0	0	0	0	1b
Dogger Bank A**	375	54	47	141	616	1c
Dogger Bank B**	461	71	58	174	765	1c
Dogger Bank C**	250	11	26	65	352	1c
East Anglia Three	0	38	41	52	130	1c
Inch Cape	0	98	18	-	115	1c
Moray West	0	121	5	122	247	1c
Neart na Gaoithe	0	187	14	-	200	1c
Seagreen Alpha	0	0	30	-	30	1c
Seagreen Bravo	0	0	34	-	34	1c
Sofia	346	20	39	100	505	1c

Project	Breeding	Autumn	Winter	Spring	Annual Total	Tier
Hornsea Three*	0	69	99	72	240	1c
Norfolk Boreas	0	9	29	12	49	1c
Norfolk Vanguard	0	30	23	31	84	1c
East Anglia ONE North	0	3	2	7	11	1c
East Anglia TWO	0	2	4	8	13	1c
Total (Consented Projects Only)	**3,268**	**1,194**	**652**	**1,106**	**6,220**	
Hornsea Four (Natural England's Bespoke Approach)	386	2,845	12	15	3,259	1d
Total (Hornsea Four plus all consented projects only)	**3,654**	**4,039**	**664**	**1,121**	**9,478**	
Dudgeon Extension Project	0	31	23	11	69	1d
Sheringham Shoal Extension Project	0	11	19	5	38	1d
Rampion 2	0	1	1	72	74	2
Total (All Projects)	**3,654**	**4,082**	**706**	**1,209**	**9,659**	

Table note: *Reduction of 516 breeding adults apportioned per annum than previously included for assessment within the **G5.25 Ornithology EIA and HRA Annex** (**REP6-028**), as advised by Natural England (**REP7-104**). ** Project also outside of the mean max plus 1 SD foraging range, therefore logically project should also have an apportioned impact of zero during the breeding season.

Table 27. FFC SPA razorbill feature annual displacement matrix when considering Natural England's bespoke approach to assessment of Hornsea Four in-combination with all consented projects only.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	2	3	4	5	9	19	28	38	47	57	66	76	85	95
10	9	19	28	38	47	95	190	284	379	474	569	663	758	853	948
20	19	38	57	76	95	190	379	569	758	948	1,137	1,327	1,516	1,706	1,896
30	28	57	85	114	142	284	569	853	1,137	1,422	1,706	1,990	2,275	2,559	2,843
40	38	76	114	152	190	379	758	1,137	1,516	1,896	2,275	2,654	3,033	3,412	3,791
50	47	95	142	190	237	474	948	1,422	1,896	2,370	2,843	3,317	3,791	4,265	4,739
60	57	114	171	227	284	569	1,137	1,706	2,275	2,843	3,412	3,981	4,549	5,118	5,687
70	66	133	199	265	332	663	1,327	1,990	2,654	3,317	3,981	4,644	5,308	5,971	6,635
80	76	152	227	303	379	758	1,516	2,275	3,033	3,791	4,549	5,308	6,066	6,824	7,582
90	85	171	256	341	427	853	1,706	2,559	3,412	4,265	5,118	5,971	6,824	7,677	8,530
100	95	190	284	379	474	948	1,896	2,843	3,791	4,739	5,687	6,635	7,582	8,530	9,478

Table 28. FFC SPA razorbill feature annual displacement matrix when considering Natural England's bespoke approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	2	3	4	5	10	19	29	39	48	58	68	77	87	97
10	10	19	29	39	48	97	193	290	386	483	580	676	773	869	966
20	19	39	58	77	97	193	386	580	773	966	1,159	1,352	1,545	1,739	1,932
30	29	58	87	116	145	290	580	869	1,159	1,449	1,739	2,028	2,318	2,608	2,898
40	39	77	116	155	193	386	773	1,159	1,545	1,932	2,318	2,704	3,091	3,477	3,863
50	48	97	145	193	241	483	966	1,449	1,932	2,415	2,898	3,381	3,863	4,346	4,829
60	58	116	174	232	290	580	1,159	1,739	2,318	2,898	3,477	4,057	4,636	5,216	5,795
70	68	135	203	270	338	676	1,352	2,028	2,704	3,381	4,057	4,733	5,409	6,085	6,761
80	77	155	232	309	386	773	1,545	2,318	3,091	3,863	4,636	5,409	6,182	6,954	7,727
90	87	174	261	348	435	869	1,739	2,608	3,477	4,346	5,216	6,085	6,954	7,824	8,693
100	97	193	290	386	483	966	1,932	2,898	3,863	4,829	5,795	6,761	7,727	8,693	9,659

Puffin Displacement In-combination Totals

Table 29. FFC SPA puffin feature (named component of the seabird assemblage) apportioned abundance totals when considering the Applicant's approach to assessment of Hornsea Four.

Project	Breeding Season FFC	Non-breeding Season FFC	Annual Total FFC	Tier
Beatrice	0	10	10	1a
Blyth Demonstration Site	0	1	1	1a
Dudgeon	0	0	0	1a
EOWDC	0	0	0	1a
Galloper	0	0	0	1a
Greater Gabbard	0	0	0	1a
Gunfleet Sands	-	-	0	1a
Humber Gateway	15	0	15	1a
Hywind 2 Demonstration	0	0	0	1a
Kentish Flats	-	-	0	1a
Kentish Flats Extension	0	0	0	1a
Lincs, Lynn and Inner Dowsing	0	0	0	1a
London Array	0	0	0	1a
Methil	0	0	0	1a
Race Bank	0	0	0	1a
Rampion	0	0	0	1a
Scroby Sands	-	-	0	1a
Sheringham Shoal	0	0	0	1a
Teesside	35	0	35	1a
Thanet	0	0	0	1a
Westermost Rough	61	0	61	1a
East Anglia One	0	0	0	1b
Hornsea Project One	407	5	412	1b
Hornsea Project Two	178	8	186	1b
Moray East	0	3	3	1b
Triton Knoll	23	0	23	1b
Kincardine	0	0	0	1b
Dogger Bank A	11	1	12	1c
Dogger Bank B	31	3	34	1c
Dogger Bank C	10	1	11	1c
East Anglia Three	0	1	1	1c
Inch Cape	0	11	11	1c
Moray West	0	16	16	1c
Neart na Gaoithe	0	9	9	1c
Seagreen Alpha	0	6	6	1c
Seagreen Bravo	0	16	16	1c
Sofia	11	1	12	1c
Hornsea Three	127	0	127	1c
Norfolk Boreas	0	1	1	1c

Project	Breeding Season FFC	Non-breeding Season FFC	Annual Total FFC	Tier
Norfolk Vanguard	0	0	0	1c
East Anglia One North	-	-	0	1c
East Anglia Two	0	0	0	1c
Total (Consented Projects Only)	**908**	**95**	**1,003**	
Hornsea Four (Applicant's Approach)	181	181	181	1d
Total (Hornsea Four plus all consented projects only)	**1,089**	**276**	**1,184**	
Dudgeon Extension Project	0	0	0	1d
Sheringham Shoal Extension Project	0	0	0	1d
Rampion 2	0	0	0	2
Total (All Projects)	**1,089**	**277**	**1,184**	

Table 30. FFC SPA puffin feature (named component of the seabird assemblage) annual displacement matrix when considering the Applicant's approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	.0	0	0	0	0	0	0	0
1	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
10	1	2	4	5	6	12	24	36	47	59	71	83	95	107	118
20	2	5	7	9	12	24	47	71	95	118	142	166	189	213	237
30	4	7	11	14	18	36	71	107	142	178	213	249	284	320	355
40	5	9	14	19	24	47	95	142	189	237	284	332	379	426	474
50	6	12	18	24	30	59	118	178	237	296	355	415	474	533	592
60	7	14	21	28	36	71	142	213	284	355	426	497	568	640	711
70	8	17	25	33	41	83	166	249	332	415	497	580	663	746	829
80	9	19	28	38	47	95	189	284	379	474	568	663	758	853	947
90	11	21	32	43	53	107	213	320	426	533	640	746	853	959	1,066
100	12	24	36	47	59	118	237	355	474	592	711	829	947	1,066	1,184

Table 31. FFC SPA puffin feature (named component of the seabird assemblage) apportioned abundance totals when considering Natural England's approach to assessment of Hornsea Four.

Project	Breeding Season FFC	Non-breeding Season FFC	Annual Total FFC	Tier
Beatrice	0	10	10	1a
Blyth Demonstration Site	0	1	1	1a
Dudgeon	0	0	0	1a
EOWDC	0	0	0	1a
Galloper	0	0	0	1a
Greater Gabbard	0	0	0	1a
Gunfleet Sands	-	-	0	1a
Humber Gateway	15	0	15	1a
Hywind 2 Demonstration	0	0	0	1a
Kentish Flats	-	-	0	1a
Kentish Flats Extension	0	0	0	1a
Lincs, Lynn and Inner Dowsing	0	0	0	1a
London Array	0	0	0	1a
Methil	0	0	0	1a
Race Bank	0	0	0	1a
Rampion	0	0	0	1a
Scroby Sands	-	-	0	1a
Sheringham Shoal	0	0	0	1a
Teesside	35	0	35	1a
Thanet	0	0	0	1a
Westermost Rough	61	0	61	1a
East Anglia One	0	0	0	1b
Hornsea Project One	407	5	412	1b
Hornsea Project Two	178	8	186	1b
Moray East	0	3	3	1b
Triton Knoll	23	0	23	1b
Kincardine	0	0	0	1b
Dogger Bank A	11	1	12	1c
Dogger Bank B	31	3	34	1c
Dogger Bank C	10	1	11	1c
East Anglia Three	0	1	1	1c
Inch Cape	0	11	11	1c
Moray West	0	16	16	1c
Neart na Gaoithe	0	9	9	1c
Seagreen Alpha	0	6	6	1c
Seagreen Bravo	0	16	16	1c
Sofia	11	1	12	1c
Hornsea Three	127	0	127	1c
Norfolk Boreas	0	1	1	1c
Norfolk Vanguard	0	0	0	1c
East Anglia One North	-	-	0	1c

Project	Breeding Season FFC	Non-breeding Season FFC	Annual Total FFC	Tier
East Anglia Two	0	0	0	1c
Total (Consented Projects Only)	**908**	**95**	**1,003**	
Hornsea Four (Natural England's Approach)	203	2	205	1d
Total (Hornsea Four plus all consented projects only)	**1,111**	**97**	**1,208**	
Dudgeon Extension Project	0	0	0	1d
Sheringham Shoal Extension Project	0	0	0	1d
Rampion 2	0	0	0	2
Total (All Projects)	**1,111**	**97**	**1,208**	

Table 32. FFC SPA puffin feature (named component of the seabird assemblage) annual displacement matrix when considering Natural England's approach to assessment of Hornsea Four in-combination with all projects up to and including Sheringham Shoal Extension, Dudgeon extension and Rampion 2.

Displacement (%)	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12
10	1	2	4	5	6	12	24	36	48	60	72	85	97	109	121
20	2	5	7	10	12	24	48	72	97	121	145	169	193	217	242
30	4	7	11	14	18	36	72	109	145	181	217	254	290	326	362
40	5	10	14	19	24	48	97	145	193	242	290	338	387	435	483
50	6	12	18	24	30	60	121	181	242	302	362	423	483	544	604
60	7	14	22	29	36	72	145	217	290	362	435	507	580	652	725
70	8	17	25	34	42	85	169	254	338	423	507	592	676	761	846
80	10	19	29	39	48	97	193	290	387	483	580	676	773	870	966
90	11	22	33	43	54	109	217	326	435	544	652	761	870	978	1,087
100	12	24	36	48	60	121	242	362	483	604	725	846	966	1,087	1,208

Red-throated Diver In-combination Totals

Table 33. Greater Wash SPA red-throated diver construction phase displacement impacts within the ECC from Hornsea Four in-combination with Sheringham Shoal and Dudgeon Extension .

Project	Predicted mortality (100% displacement & 1% mortality rate)	Predicted mortality (100% displacement & 10% mortality rate)
Hornsea Project Four	0.0	0.3
Sheringham Shoal and Dudgeon Extension	0.0	0.3
Total	**0.0**	**0.6**

Appendix E

List of Tables in Appendix E

Table 1. Gannet FFC SPA CFPS modelling results

Increase in mortality (per annum)	Total mortality (per annum)	Density independent counterfactual of final population size (after 35 years)	CFPS
5	2,175	0.992	0.83%
10	2,180	0.984	1.59%
15	2,185	0.976	2.36%
20	2,190	0.969	3.13%
30	2,200	0.953	4.70%
40	2,210	0.938	6.21%
50	2,220	0.923	7.65%
75	2,245	0.887	11.27%
100	2,270	0.853	14.71%
125	2,295	0.819	18.06%
150	2,320	0.787	21.29%
175	2,345	0.756	24.36%
200	2,370	0.727	27.33%
225	2,395	0.698	30.19%
250	2,420	0.671	32.95%
275	2,445	0.644	35.56%
300	2,470	0.619	38.14%
325	2,495	0.594	40.56%
350	2,520	0.571	42.92%
375	2,545	0.549	45.14%
400	2,570	0.526	47.35%
425	2,595	0.506	49.43%
450	2,620	0.485	51.45%
475	2,645	0.466	53.36%
500	2,670	0.448	55.23%
600	2,770	0.380	61.95%
700	2,870	0.323	67.70%
800	2,970	0.274	72.60%
900	3,070	0.232	76.76%
1,000	3,170	0.197	80.32%

Table 2. Kittiwake FFC SPA CFPS modelling results.

Increase in mortality (per annum)	Total mortality (per annum)	Density independent counterfactual of final population size (after 35 years)	CFPS
5	15,053	0.998	0.23%
10	15,058	0.995	0.45%
15	15,063	0.993	0.65%
20	15,068	0.991	0.86%
30	15,078	0.987	1.29%
40	15,088	0.983	1.70%
50	15,098	0.979	2.14%
75	15,123	0.968	3.18%
100	15,148	0.958	4.23%
125	15,173	0.947	5.27%
150	15,198	0.937	6.31%
175	15,223	0.927	7.30%
200	15,248	0.917	8.26%
225	15,273	0.907	9.26%
250	15,298	0.898	10.24%
275	15,323	0.888	11.22%
300	15,348	0.878	12.20%
325	15,373	0.869	13.10%
350	15,398	0.859	14.09%
375	15,423	0.850	14.96%
400	15,448	0.841	15.94%
425	15,473	0.832	16.82%
450	15,498	0.823	17.72%
475	15,523	0.814	18.62%
500	15,548	0.805	19.50%

Table 3. Kittiwake FFC SPA CFPS modelling results using a productivity rate of 0.8..

Increase in mortality (per annum)	Total mortality (per annum)	Density independent counterfactual of final population size (after 35 years)	CFPS
5	15,053	0.998	0.21%
10	15,058	0.996	0.44%
15	15,063	0.994	0.64%
20	15,068	0.991	0.85%
30	15,078	0.987	1.29%
40	15,088	0.983	1.73%
50	15,098	0.979	2.14%
75	15,123	0.968	3.22%
100	15,148	0.957	4.30%
125	15,173	0.947	5.34%
150	15,198	0.936	6.39%
175	15,223	0.926	7.39%
200	15,248	0.916	8.39%
225	15,273	0.906	9.41%
250	15,298	0.896	10.40%
275	15,323	0.886	11.37%
300	15,348	0.877	12.33%
325	15,373	0.867	13.28%
350	15,398	0.858	14.24%
375	15,423	0.848	15.19%
400	15,448	0.839	16.13%
425	15,473	0.830	17.04%
450	15,498	0.821	17.94%
475	15,523	0.812	18.85%
500	15,548	0.803	19.74%

Table 4. Guillemot FFC SPA CFPS modelling results.

Increase in mortality (per annum)	Total mortality (per annum)	Density independent counterfactual of final population size (after 35 years)	CFPS
10	7,437	0.997	0.33%
15	7,442	0.995	0.50%
20	7,447	0.993	0.66%
30	7,457	0.990	0.98%
40	7,467	0.987	1.30%
50	7,477	0.984	1.64%
75	7,502	0.976	2.44%
100	7,527	0.968	3.24%
125	7,552	0.959	4.05%
150	7,577	0.952	4.84%
175	7,602	0.944	5.63%
200	7,627	0.936	6.42%
225	7,652	0.928	7.18%
250	7,677	0.920	7.95%
275	7,702	0.913	8.71%
300	7,727	0.905	9.47%
325	7,752	0.898	10.21%
350	7,777	0.890	10.96%
375	7,802	0.883	11.69%
400	7,827	0.876	12.43%
425	7,852	0.868	13.15%
450	7,877	0.861	13.86%
475	7,902	0.854	14.58%
500	7,927	0.847	15.28%
750	8,177	0.780	22.05%
1000	8,427	0.717	28.29%
1250	8,677	0.660	34.04%
1500	8,927	0.607	39.34%
1750	9,177	0.558	44.22%
2000	9,427	0.513	48.74%
2250	9,677	0.471	52.88%
2500	9,927	0.433	56.70%
2750	10,177	0.398	60.22%
3000	10,427	0.365	63.46%
3250	10,677	0.336	66.45%
3500	10,927	0.308	69.19%
4000	11,427	0.260	74.05%
4500	11,927	0.218	78.15%
5000	12,427	0.184	81.62%

Table 5. Razorbill FFC SPA CFPS modelling results

Increase in mortality (per annum)	Total mortality (per annum)	Density independent counterfactual of final population size (after 35 years)	CFPS
5	4,258	0.995	0.51%
10	4,263	0.989	1.10%
15	4,268	0.984	1.58%
20	4,273	0.979	2.06%
30	4,283	0.969	3.11%
40	4,293	0.959	4.13%
50	4,303	0.949	5.10%
75	4,328	0.924	7.61%
100	4,353	0.900	9.98%
125	4,378	0.877	12.34%
150	4,403	0.854	14.61%
175	4,428	0.832	16.83%
200	4,453	0.810	18.98%
225	4,478	0.789	21.10%
250	4,503	0.769	23.14%
275	4,528	0.749	25.12%
300	4,553	0.729	27.12%
325	4,578	0.710	28.97%
350	4,603	0.692	30.85%
375	4,628	0.673	32.67%
400	4,653	0.655	34.45%
425	4,678	0.638	36.17%
450	4,703	0.622	37.83%
475	4,728	0.605	39.46%
500	4,753	0.589	41.05%
550	4,803	0.559	44.11%
600	4,853	0.530	47.02%
650	4,903	0.502	49.77%
700	4,953	0.476	52.39%
750	5,003	0.451	54.89%

Table 6. Razorbill FFC SPA CFPS modelling results using guillemot survival rate demographics.

Increase in mortality (per annum)	Total mortality (per annum)	Density independent counterfactual of final population size (after 35 years)	CFPS
5	4,258	0.995	0.49%
10	4,263	0.990	0.98%
15	4,268	0.985	1.47%
20	4,273	0.980	1.95%
30	4,283	0.971	2.93%
40	4,293	0.961	3.88%
50	4,303	0.952	4.85%
75	4,328	0.928	7.24%
100	4,353	0.905	9.51%
125	4,378	0.883	11.73%
150	4,403	0.861	13.93%
175	4,428	0.839	16.06%
200	4,453	0.818	18.15%
225	4,478	0.798	20.17%
250	4,503	0.778	22.16%
275	4,528	0.759	24.10%
300	4,553	0.740	25.98%
325	4,578	0.722	27.82%
350	4,603	0.704	29.63%
375	4,628	0.686	31.37%
400	4,653	0.669	33.09%
425	4,678	0.653	34.74%
450	4,703	0.636	36.38%
475	4,728	0.620	37.98%
500	4,753	0.605	39.53%
550	4,803	0.575	42.51%
600	4,853	0.547	45.35%
650	4,903	0.519	48.07%
700	4,953	0.494	50.65%
750	5,003	0.469	53.09%

Table 7. Puffin FFC SPA CFPS modelling results.

Increase in mortality (per annum)	Total mortality (per annum)	Density independent counterfactual of final population size (after 35 years)	CFPS
1	323	0.988	1.18%
3	325	0.963	3.68%
5	327	0.941	5.89%
7	329	0.920	8.01%
10	332	0.888	11.17%
15	337	0.837	16.34%
20	342	0.787	21.27%
25	347	0.743	25.68%
30	352	0.699	30.09%
35	357	0.659	34.09%
40	362	0.621	37.94%
45	367	0.585	41.52%
50	372	0.551	44.87%
55	377	0.518	48.19%
60	382	0.489	51.12%
65	387	0.459	54.08%
70	392	0.432	56.83%
75	397	0.407	59.33%
80	402	0.383	61.69%
85	407	0.360	64.04%

Appendix F

By email for the attention of the Secretary of State for Business, Energy and Industrial Strategy

9th January 2023

09 January 2023

Our ref. HOW04 Wenlock Repurposing

Dear Secretary of State for Business Energy and Industrial Strategy,

This letter forms a joint response on behalf of the Applicant, Alpha Petroleum Resources Limited and Energean UK Limited (the Parties).

As referred in the Schedule of Side Agreements (REP8-008) the Parties entered into an MoU on 9th June 2022 with a view to the potential repurposing of the Wenlock platform situated in the Wenlock gas field in the Southern North Sea approximately 145 km east of Humberside (the Platform).

The MoU includes a commitment to negotiate in good faith towards a legally binding agreement to transfer ownership of the Platform to the Applicant. The Parties can confirm that they are in detailed discussions in relation to the asset transfer agreement and hope to conclude the option and asset transfer agreement during 2023 in accordance with the MoU.

Yours sincerely,

Orsted Hornsea Project Four Limited confirms its agreement to the above

[redacted]

Julian Carolan
Hornsea Four Consents Project Manager

Alpha Petroleum Resources Limited hereby confirms its agreement to the above.

[redacted]

Paul Tanner
Director, Alpha Petroleum Resources Limited

Energean UK Limited hereby confirms its agreement to the above.

[redacted]

Panos Benos
Director, Energean UK Ltd

Appendix G

Hornsea Four

New Offshore Nesting Structure Location

Location	Longitude (WGS84)	Latitude (WGS84)
New Offshore Nesting Structure	1.007749	53.791682

New Offshore Nesting Structure

Coordinate system: ETRS 1989 UTM Zone 31N

Scale@A3: 1:50,000

0 500 1,000 1,500 2,000 Metres

0 0.5 1 Nautical Miles

REV	REMARK	DATE
	First Issue	29/11/2022
A	Labelling change	05/01/2023

Offshore Nesting Structures
Agreement for Lease Area
Document no: HOW040654
Created by: RICYO
Checked by: WILGI
Approved by: FELBR

Ørsted

Date: 10/01/2023 Author: RICYO Name: HOW040654_OffshoreNestingStructures_AgreementforLeaseArea_MAP_RevA_20230105