

Norfolk Boreas Offshore Wind Farm Applicant's Response to Natural England's REP7-045 and REP7- 046

Applicant: Norfolk Boreas Limited
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Glossary of Acronyms

COCP	Code of Construction Practice
DCO	Development Consent Order
DOC	Document
EMP	Ecological Management Plan
ES	Environmental Statement
HDD	Horizontal Directional Drilling
LSE	Likely Significant Effect
M	Metres
NE	Natural England
OCoCP	Outline Code of Construction Practice
OLEMS	Outline Landscape and Ecological Management Strategy
OTMP	Outline Traffic Management Plan
OWF	Offshore wind farm
RAG	Red, Amber, Green
SAC	Special Area of Conservation
SoS	Secretary of State
SSSI	Site of Special Scientific Interest
TC	Trenchless Crossing

1 Introduction

1. This document contains the Applicant's Response to the following Natural England Deadline 7 Submissions
 - Natural England's response to the Applicant's comments on Deadline 4 submissions [REP7-045]
 - Natural England's response to the Applicant's responses to the Examining Authority's Further Written Questions [REP7-046]

2 Responses to Natural England's Detailed Comments [REP7-045]

Table 2.1 Natural England's Updated Benthic Ecology Advice REP4-038

Summary of Submission	Applicant's Comments at Deadline 4	Natural England's Comments at Deadline 7	Applicant's Comments at Deadline 8
DCO Document 8.11 Outline Offshore Operation and Maintenance Plan			
2.2 <i>Page 10</i> Why in the Table (Appendix 1) is 'cable burial with surface protection' – no marine licence required included and then the next row is 'placement of cable protection in new areas' - yes marine licence required. This is confused as surely the first one is replacement of cable protection installed during installation? Please can the Applicant clarify	Appendix 1 of the Norfolk Boreas OOMP has been drafted to accord with the Norfolk Vanguard OOMP. This is especially relevant to any licensed activity within the HHW SAC as both projects would be installing cables within the site. The Applicant does however acknowledge that the three rows to which Natural England refer do overlap. Accordingly, the Applicant has removed the line with the words "using surface protection" from the updated OOMP submitted at Deadline 5 [document 8.11].	Natural England thanks the Applicant for amending the table to aid clarity	The Applicant has no further comment.
2.4 <i>Section 1.1, Page 4</i> Please note that monitoring is for residual impacts to ensure that they are not significantly affecting the environment, and that the predictions/assessment conclusions are correct. Monitoring will need to demonstrate this and any hypothesis of the HRA.	The Applicant agrees that monitoring should be for residual impacts and this is discussed further in section 3 of the IPMP.	See comment on the IPMP	See row 2.7 below.
2.5 <i>Section 9, Page 5</i> What happens if NVG is under construction and impacts upon NB pre construction surveys and vice versa in terms of NVG monitoring requirements?	The only part of the offshore project area where Norfolk Boreas surveys have a realistic potential to overlap with Norfolk Vanguard construction surveys would be within the offshore cable corridor and within the project interconnector search area, should the final design include a project	The Applicant's response hasn't really addressed the point in relation to monitoring and ensuring that if necessary a BACI style survey design can be used. What happens if it is found the NVG data	The Applicant is confident that the interim survey and the pre-construction surveys to be carried out for Norfolk Boreas would be sufficient to establish a robust baseline. The Norfolk Vanguard

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	<p>interconnector. In order not to damage already installed cables there is a requirement for Norfolk Boreas cables to be located up to 250m from the Norfolk Vanguard cables [Plate 5.2 REP1-033]. Norfolk Boreas have committed to undertake a survey of the area within which it is proposed that seabed works will be carried out. In the unlikely event that the survey for Norfolk Boreas would need to be undertaken at the same time as export cable installation works for Norfolk Vanguard, the surveys would focus on different geographical areas. Furthermore, It would be in the interests of Norfolk Boreas Limited to ensure that its survey timelines are developed in such a way as to maximise the use of data and experience gathered by Norfolk Vanguard as well as ensuring that the surveys would not interfere with Norfolk Vanguard's construction. The following text has been added to the updated IPMP submitted at Deadline 5 to state: Norfolk Boreas Limited will endeavour to develop its survey timelines in such a way as to maximise the use of data and experience gathered by Norfolk Vanguard.</p>	<p>can't be used and NB data is required?</p>	<p>pre-construction survey data would be used to supplement the Norfolk Boreas surveys adding further understanding as to the locations and extent of the Annex I <i>S.spinulosa</i> reef within the offshore cable corridor.</p>
<p>2.6 <i>Section 35, Page 15</i> Natural England would like clarity from the Applicant as to what they see the benefits being of undertaking an Annex I reef survey in 2020. Our understanding is that the survey results will not feed into the Boreas examination. And whilst we always welcome more survey data in this situation we envision there</p>	<p>The survey has been designed to provide the Applicant and Norfolk Vanguard with a reliable baseline to underpin the core reef approach and to allow initial cable routeing design to avoid areas of <i>S.spinulosa</i> reef . This data would then be supplemented by the Norfolk Vanguard pre-construction surveys and then the Norfolk Boreas pre-construction surveys. The Applicant understands that two fisheries management areas have been proposed which overlap with the cable corridor and that this may result in a change to the extent and location of <i>S.spinulosa</i> reef. The first area to be</p>	<p>Natural England thanks the Applicant for the clarification and has no further comment at this time</p>	<p>The Applicant has no further comment.</p>

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<p>being two likely outcomes; a) Applicant demonstrates reef is there and Natural England advice doesn't change or b) Applicant demonstrates there isn't any reef currently present and Natural England advice doesn't change as the fisheries byelaw/management measures to ensure recovery hasn't started being implemented yet. Moreover, in relation to outcome b we advise there is a risk that 2 years' post 2020 a similar survey could have very different results. Outside of the byelaw areas the data could start to help form a core reef approach, but again more than one additional dataset would be required to fully implement that. Therefore we wish to highlight this to the Applicant in order to inform their decision making process</p>	<p>implemented is likely to be the EIFCA byelaw area which is expected to come into effect sometime in the Autumn of 2020 [REP2-069]. This would only occupy approximately 1.5% of the section of the offshore cable corridor within the SAC. Whilst <i>S.spinulosa</i> reef could increase within this protected area as a result of less fishing activity, this change will not affect the remaining 98.5% of the offshore cable corridor. Furthermore, the proposed bylaw does not stretch across the entire width of the offshore cable corridor, therefore even if the change results in recovery of Annex I <i>S.spinulosa</i> reef, would not occur across the entire width of the offshore cable corridor in that particular location. The Applicant's clarification note submitted at Deadline 4 [REP4-022] demonstrates that in this scenario, sufficient space would remain within the offshore cable corridor at this location to install the Norfolk Boreas and Norfolk Vanguard export cables. The Applicant is also aware of a fisheries management area which has been proposed by Defra to restrict fishing activity across a much larger section of the SAC. Given the joint recommendation requirements to implement this restriction, there is however little prospect that it will be implemented in advance of the anticipated offshore construction date for Norfolk Boreas, especially given the uncertainty on how fisheries closures will be progressed following Brexit. Furthermore, there is no guarantee that the restriction proposed by Defra will lead to recovery of Annex 1 <i>S.spinulosa</i> reef. The Vessel Monitoring System (VMS) data used in the Joint recommendation for the restriction showed that there has been very little fishing within the majority</p>		

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	<p>of the Norfolk Boreas offshore cable corridor and therefore the restrictions will not result in a significant change in fishing pressure. This is applicable to both the Defra recommended restriction and the EIFCA proposed byelaw. For further discussion on this please see section 3.1.1 of the Applicant's position paper on the HHW SAC [ExA.AS-6.D5.V1]). There is also recent research which has found <i>S.spinulosa</i> reef in areas that experience high levels of fishing pressure; Van de Reijden (2019), published a paper on the Discovery of <i>Sabellaria spinulosa</i> reefs in an intensively fished area of the Dutch Continental Shelf, North Sea. It is however recognised that, should the fisheries management area be implemented prior to Norfolk Boreas construction, further survey work will be required to establish to what extent (if any) the <i>S.spinulosa</i> reef has recovered as a result of the fishing restrictions. This would be completed as part of the Norfolk Vanguard and Norfolk Boreas Pre-construction surveys.</p>		
<p>2.7 <i>Table 4.2 The IPMP only seems to focus on construction and not on Operations and Management (O&M). The requirement for Annex I reef surveys for O&M activities seems to have fallen between the cracks. Monitoring of Annex 1 reefs for O&M will be required in the form of Geophysical data and ground truthing using drop down video, completed 18 months –</i></p>	<p>Three surveys will inform understanding prior to commencement of any works, being the proposed <i>S.spinulosa</i> reef surveys in 2020, the Norfolk Vanguard pre construction surveys likely to be undertaken in 2023-2024 and the Norfolk Boreas preconstruction surveys (likely to be undertaken in 2024 -2025). The scope of each survey would be agreed with Natural England and the MMO. The IPMP (REP1-029) commits the Applicant to undertake surveys to monitor known areas of <i>S.spinulosa</i> reef at "a frequency to be agreed with the MMO (e.g.3 years non consecutive e.g. 1, 3 and 6 years or 1, 5 and 10 years). If evidence of recovery</p>	<p>Natural England does not believe that this is sufficient to address potential impacts to Annex I reef over the life time of the project from proposed works. Therefore this remains in disagreement</p>	<p>The Applicant maintains that up to six separate surveys would be sufficient to establish a baseline and then monitor the potential impacts. However, the IPMP does not limit the number of surveys which may be undertaken. The final number of surveys along with the timing of these surveys to address any effects of the O&M activities would be established through the final plan.</p>

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2 years prior to the works taking place. For anything other than this justification will be required	is available and agreed with the MMO, monitoring will cease. Surveys specifically targeting those reefs identified in the baseline survey will be undertaken as a check on their condition using the same methodology set out for pre-construction monitoring to be agreed with the MMO". Therefore, the Applicant considers that monitoring during the operation period has been considered with the possibility of three or more surveys over a period of ten or more years post construction.		
DCO Document 8.20 Outline Norfolk Boreas Haisborough Hammond and Winterton Special Area of Conservation Site Integrity Plan			
2.1 Section 56, Section 4.2.1 An Annex I reef survey is planned for 2020, it would be good to know how this relates to the construction time table.	An indicative construction programme is provided in Table 5.26 of the ES [APP-218]. Based on this the 2020 survey would take place four years prior to pre-construction activity taking place and five years prior to the main construction activity commencing.	Natural England thanks the Applicant for the clarification and has no further comment at this time	The Applicant has no further comment.
2.1 Section 77, Page 25 Natural England notes the Applicant refers to temporary disturbance if Annex I reef cannot be avoided. This is something that Natural England has advised against in our RR [099], and our advice remains unchanged.	The Applicant understands this advice, however as requested by Natural England, the Applicant has had to account for a scenario where the entire cable route contains <i>S.spinulosa</i> reef, at which point temporary impact would be necessary over a relatively small (in terms of the extent that <i>S.spinulosa</i> reef would have to have increased to create this situation) area.	Natural England advice remains unchanged	The Applicant has no further comment.
2.2 Section 127, Page 37 The proposals are not mitigation, but best practice and doesn't remove cable protection requirement.	The Applicant agrees this is not additional mitigation which removes the need for cable protection. However, the Applicant considers that these commitments do reduce the risk of impacts on the SAC	Area of uncommon ground.	The Applicant has no further comment.
2.2 Appendix 3 of SIP - likely Cable protection locations Whilst this document gives more confidence that areas of	The Applicant has now made the commitment to avoid cable protection in the areas which Natural England have identified as priority areas [RR-099]	This does not address Natural England's concerns about the wider SAC.	Although the Applicant recognises that Natural England's position is that no cable protection should be placed within the HHW SAC it is

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<p>reef will be avoided, we remain concerned that protection is still being proposed within the site.</p>			<p>not possible to make this commitment at this stage. Once further ground investigation and route selection work has been completed it may possible for the project to install cables without the need for cable protection. However, this will not be determined until pre-construction. The commitment to not place cable protection in the Priority areas was made, in consultation with Natural England, to ensure the areas where Natural England have the highest confidence that reef can recover are protected.</p>

Table 2.2 Natural England Updated Ornithology Advice REP4-040

Summary of Submission	Applicant's Comments at Deadline 4	Natural England's Comments at Deadline 7	Applicant's Comments at Deadline 8
General			
Precaution in Assessments	Natural England provided a response on the Applicant's concerns regarding the over-precaution in the ornithology assessment in REP4-039 which included the same information as presented in REP4-040. The Applicant has responded to these comments in Table 1.1.1. In addition to the comments in REP4-039 addressed above, in REP4-040 Natural England suggests that because the collision estimates obtained using Option 1 of the Band collision risk model (CRM) are higher than those obtained using Option 2 this supports the degree of precaution Natural England applies in ornithology assessment. However, the Applicant does not consider it appropriate to consider the Option 1 estimates in this manner due to the concerns raised by the aerial survey contractor about the reliability of their own methods. Furthermore, for these reasons it was agreed with Natural England during the Evidence Plan Process that the Applicant's assessment would be based on Option 2 (Project document ref: PB5640-004-025). Therefore, the Applicant considers Natural England's reference to the Option 1 estimates is inappropriate and that these should not be used as supporting evidence for the high levels of precaution proposed by Natural England.	We note that our response did not mean that because the Option 1 collision estimates are higher than the Option 2 values using generic flight height data, this supports the degree of precaution. Our representation was simply noting that if the site-specific flight height data are in fact more reflective of the behaviour of birds using the Norfolk Boreas site than the generic flight height data, then the collision predictions based on Option 2 may lack sufficient precaution	The Applicant notes Natural England's response on this matter and refers back to the agreement with Natural England that for Norfolk Boreas option 1 estimates are not considered reliable for impact assessment (due to the concerns raised by the aerial survey contractor) and that option 2 estimates should be used. Thus, the Applicant does not consider that further discussion on the differences between the option 1 and option 2 outputs is informative for the current project assessment.
Cumulative / in-combination assessments	The Applicant welcomes that Natural England has confirmed that, with the following exceptions, the cumulative assessment has been conducted as requested in RR-099. The Applicant notes Natural England's position with regard to the inclusion of projects which have not yet been determined and	As noted in our previous representations, the non-material change application for Dogger Bank Creyke Beck does not change the consented worst case scenario for collisions from this windfarm. We therefore welcome that Applicant's commitment to include this	The Applicant can confirm that the values requested by Natural England to be used for Dogger Bank Creyke Beck have been presented on the submission at Deadline 6 (REP6-024) and notes Natural England has commented on the updated

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	<p>for which Natural England has outstanding concerns regarding the figures presented (Hornsea Project Three and Hornsea Project Four). For these reasons the Applicant has provided cumulative and in-combination assessments with and without these projects. Natural England has also requested that the Applicant reverts to the consented collision mortality estimates for the Dogger Bank Creyke Beck wind farm, in place of those submitted in that project's non-material change application. The updated cumulative and in-combination collision assessment to be submitted at Deadline 6 will include this revision.</p>	<p>revision in the updated cumulative and in-combination collision assessments that they will submit at D6. Natural England will provide comment on these updated assessments for D7.</p>	<p>cumulative and in-combination assessment (REP6-024) at Deadline 7 (in REP7-047). The Applicant has commented on this submission at Deadline 8 (ExA.AS-3.D8.V1).</p>
<p>Population Viability Analysis (PVA)</p>	<p>The Applicant welcomes the fact that Natural England has given consideration to the PVA results as presented at Deadline 2 (REP2-035), and also acknowledges Natural England's request that the PVA results be updated following a planned update to the Natural England PVA tool. Natural England informed the Applicant that the updates to this tool have been further delayed and these will not be available within the project's timeframe for examination. However, Natural England has also advised the Applicant that their own internal comparison of the original and updated PVA outputs has confirmed that the results are not materially altered and therefore the outputs in REP2-035 are robust for assessment.</p>	<p>Please note that Natural England has not confirmed that the updated PVA tool would definitely not be available within the Boreas examination timeframe. Since our D5 response to ExA Q2.2.2.1 [REP5-077], we have advised the Applicant (in an email dated 03/03/2020) that version 2 of the PVA Tool has been uploaded. A link to the new version was sent to the Applicant. We noted that the guidance documents etc. had also been updated and were available from the links sent to the Applicant. We recommend that the models are re-run using version 2 of the tool in instances where the current models are not e set-up and parameterised in the way we have advised (i.e. sufficient simulations etc.) in our Deadline 4 response [REP4-040]. We also advised the Applicant that there is a bug in version 2 which is affecting the annualised growth rates presented in the full table of outputs – however this is only an issue for the year prior to the</p>	<p>The Applicant would like to clarify that following the Natural England advice that the revised PVA would be delayed it was the Applicant that made the observation that this would likely prevent revision of the PVA assessments during the examination for all the species where this has been used due to time constraints.</p> <p>The bugs to which Natural England make reference to in the PVA model code are not ones which affect the counterfactual measures that the Applicant has used in the assessment therefore these are not considered a concern for the impact assessment.</p> <p>However, the Applicant can confirm that the PVA has been re-run for those instances where the current models were not set up and parameterised in the way</p>

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		<p>impact being added. The bug doesn't affect any of the other metrics – it is just affecting the way the table presents values for the run of years prior to when an impact is added. Furthermore, if the tool is run with respect to a baseline population it doesn't affect the table outputs for this. Finally, it is noted that when the model is run with an impact, it doesn't affect the annualised growth rate calculations in the full table of outputs for the period when the impact is applied.</p>	<p>Natural England advised. The outputs from these revised PVA model from simulations with 1,000 and 5,000 iterations were presented at Deadline 7 (REP7-031) for those examples where previously it was only possible to successfully undertake smaller runs of 500 simulations (kittiwake EIA and guillemot for Flamborough and Filey Coast Special Protection Area; REP2-035). The additional outputs have demonstrated that there is virtually no difference in the counterfactual metrics with 500, 1,000 and 5,000 simulations. The largest difference obtained between 500 and 5,000 simulations was 0.14%, while most differences were at least an order of magnitude smaller (i.e. <0.01%). Furthermore, the outputs for 500 simulations were obtained using the original version of the PVA model (REP2-035) while those in the Deadline 7 submission (REP7-031) used the updated version. Therefore, not only do the additional simulations make no material difference to the counterfactual metrics, but also the PVA model updates have made no difference to these metrics. This corresponds with Natural England's finding, noted in REP5-077:</p> <p><i>'...we are not aware that the updates will make a significant difference to the counterfactual metric outputs of models run using the previous/currently available</i></p>

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			<p><i>version of the tool. This conclusion is on the basis that the testing undertaken has not thrown up any significant issues with the tool. Therefore, we will use the counterfactual of population size (CPS) and counterfactual of growth rate (CGR) metric outputs from models run by the Applicant using the previous version of the tool as presented in the Deadline 2 updated assessments [REP2-035], provided these are set-up and parameterised in the way we have advised (i.e. sufficient simulations etc.) in our Deadline 4 response [REP4-040].'</i></p> <p>This response also applies to the other references to PVA made by Natural England in REP7-046, REP7-52, REP7-048, REP7-047 and REP7-053, which reiterate the same comments regarding the version of the PVA used and the number of simulations on which the outputs are based.</p> <p>Thus, the Applicant considers that the PVA reported in REP2-035, supported by the additional modelling in REP7-031 (as requested by Natural England), means that all the PVA modelling has been conducted in accordance with Natural England's advice on set-up and parameters and that no further PVA is required.</p>

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EIA			
EIA Impacts of Norfolk Boreas – overall	The Applicant welcomes Natural England's agreement that the project alone will have no significant adverse impacts on any species (with the exception of red-throated diver for which Natural England has been unable to rule out a significant adverse effect. This is discussed in more detail under the project alone displacement, below). Nonetheless, the Applicant has continued to explore options for reducing impacts through design mitigations, with a commitment to an increase in draught height (to a minimum of 30m from Mean high Water Springs (MHWS) for wind turbines of 14.7MW and above and to a minimum of 35m from MHWS for wind turbines of up to 14.6MW) and removal of turbine models of less than 11.55MW from the design envelope. The updated collision assessment for these changes has been submitted at Deadline 5 (ExA.AS-8.D5.V2). These mitigations reduce collision estimates by up to 74% compared with the values in the original application (APP-226).	Natural England welcomes the further mitigation from the Applicant and the updated CRM to account for this mitigation submitted by the Applicant at D5. Natural England will provide comment on this updated CRM for D7.	The Applicant welcomes Natural England's position on this matter and has provided responses to the Natural England deadline 7 submissions (REP7-047, REP7-048 and REP7-052) on the updated collision risk modelling in ExA.AS-4.D8.V1.
EIA impacts of Norfolk Boreas alone – collision risk	The Applicant welcomes Natural England's agreement with the Applicant that the project alone will have no significant adverse impacts on any species due to collisions, and notes that further reductions in predicted collision risk have been submitted at Deadline 5 (ExA.AS-8.D5.V2).	Natural England has provided comment for D7 (Ref NE.NB.D7.08 CRM).	The Applicant has provided a response to the Natural England deadline 7 submission (NE Ref NE.NBD7.08.CRM / REP7-047) in ExA.AS-3.D8.V1.
EIA impacts of Norfolk Boreas alone – displacement risk	The Applicant welcomes Natural England's agreement with the Applicant that the project alone will have no significant adverse impacts on gannet, guillemot and razorbill due to displacement. However, Natural England considers that a significant impact cannot be ruled out for	As has been previously noted in our Relevant Representations for the Norfolk Boreas project [RR-099], definitive mortality rates for seabirds (including RTDs) are unknown and therefore we advise a range of figures for mortality rates of between 1% and 10% are considered for	The Applicant welcomes Natural England's consideration of the circumstances regarding the potential impacts on red-throated diver due to displacement from the project alone and that Natural England is in agreement that

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	<p>red-throated diver. The Applicant disagrees with Natural England's conclusion as it has been reached through a combination of assumptions in the assessment which the Applicant has provided following Natural England advice, but which are considered over-precautionary, as discussed in detail in REP2- 035 (paragraphs 132 to 136) and the strict application of Natural England's preferred displacement and mortality rates. The Applicant considers that Natural England has not given due consideration to other factors which combine to indicate that for this assessment the application of a 10% mortality rate is highly precautionary and not appropriate. In summary, the annual (non-breeding) displacement total is the sum of the seasonal totals for autumn, winter and spring, of which the spring contribution is over 77%. The spring density estimate used in the assessment was strongly influenced by a late March survey (see REP2- 035 for details) which is in the middle of the peak period of migration. During this period a large number of this species passes through the region and currently individuals are likely to be present for relatively short periods. Consequently the application of a 10% mortality rate to birds likely to be present for no more than two to three weeks at most (and even that duration is likely to be an over-estimate) is highly precautionary. At 10% mortality the predicted spring mortality due to displacement is 80, while at the Applicant's evidence based (precautionary) rate of 1% it is 8. The threshold for a 1% increase in the background mortality of the smaller Biologically Defined Minimum Population Scale (BDMPS) is 30 individuals. Therefore even if</p>	<p>redthroated diver (RTD) assessments. The joint SNCB interim displacement advice note (SNCBs 2017) acknowledges that summing seasonal impacts to give an annual prediction could result in birds being assessed in more than one season, and thus 'double counted'. However, the precautionary approach is required in the absence of empirical information on seasonal turnover on development sites. The Applicant argues that summing the seasonal predicted displacement impacts for autumn, winter and spring for RTD is precautionary, because the same birds could be affected in more than one season. If there is a high degree of turnover of individual birds, as suggested here for RTD passing through the Boreas site on spring migration (in late March), Natural England agrees that it is probably unrealistic to assume that 10% of the RTDs at this time would be likely to die as a result of displacement mortality, given they are likely to be present at the site for a short time period. The spring contribution to the overall number of RTDs at risk of displacement annually from Norfolk Boreas is over 77%. The annual number of RTDs predicted to die as a result of displacement from the Norfolk Boreas array footprint only exceeds 1% of baseline mortality of the largest Biologically Defined Minimum Population Scale (BDMPS) when the displacement rate is 100% and the mortality rate is at 4% and above. For the biogeographic population, the annual number of RTDs predicted to die as a result of displacement from the Norfolk Boreas array</p>	<p>a significant adverse impact can be ruled out.</p>

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	<p>the mortality rate was as high as 3.75% this would still not result in a detectable effect on this BDMPS population while for the larger biogeographic population a mortality of less than 61 individuals (obtained with a 7.8% mortality rate) would be undetectable. Thus, even with still precautionary assumptions on displacement mortality (of up to 3.75 and 7.8% for the BDMPS and biogeographic populations respectively) the effect would be undetectable against background variations. Thus, the Applicant does not agree with Natural England's conclusion and considers that a significant impact due to displacement from the project alone can be ruled out.</p>	<p>footprint only exceeds 1% of baseline mortality when the displacement rate is 100% and the mortality rate is at 8% and above. Therefore, considering these outputs in the context of the specific timings of RTD peak abundance on the Norfolk Boreas site, we would now agree with the Applicant that a significant adverse impact can be ruled out for operational displacement of RTD from Norfolk Boreas alone.</p>	
<p>EIA impacts of Norfolk Boreas alone – displacement and collision risk combined (gannet)</p>	<p>The Applicant welcomes Natural England's agreement with the Applicant that the project alone will have no significant adverse impact on gannets due to collisions and displacement combined (and that this combined assessment introduces precaution into what the Applicant considers to already be a highly precautionary assessment). The Applicant also notes that further reductions in the predicted collision risk component of this potential impact have been submitted at Deadline 5 (ExA.AS-8.D5.V2).</p>	<p>As noted in our Deadline 4 response [REP4-040], in summing the predicted mortalities that arise via collision and displacement these two mechanisms, there is a risk of some degree of double counting as a bird that collides with a turbine and dies cannot be displaced and a bird that dies as a result of displacement cannot collide with the turbine. Thus, it is acknowledged that this simplistic approach will therefore incorporate a degree of precaution. The level of precaution is difficult to gauge, but will be highest when the number of birds recorded flying at turbine height (and therefore the predicted number of collisions) is greatest (SNCBs 2017). However, as noted in our Deadline 4 responses [REP4-039 and REP4-040], Natural England does not consider that the overall assessment is highly precautionary in terms of displacement rates, mortality rates,</p>	<p>The Applicant acknowledges Natural England's position on this matter, and also welcomes the main point which is that the Applicant and Natural England are in agreement that the project alone will have no significant adverse impact on gannets due to collisions and displacement combined.</p>

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		avoidance rates etc. and the use of a range of predicted impacts.	
EIA Impacts of Norfolk Boreas cumulatively - overall	The Applicant welcomes that Natural England has agreed that cumulative impacts can be ruled out for displacement of gannets and collisions of lesser black-backed gull, herring gull and little gull (when the uncertainty regarding impact levels for Hornsea Project Three and Hornsea Project Four are omitted). However, the Applicant does not agree with Natural England's conclusions for the remaining impacts, as detailed in the rows below. In addition, Natural England has highlighted that little gull collision figures for East Anglia ONE North and East Anglia TWO need to be included. These will be added to the little gull cumulative assessment to be submitted at Deadline 6.	Natural England welcomes the commitment from the Applicant to include the little gull collision figures for EA1N and EA2 in the updated cumulative collision assessments to be submitted at D6. We will provide comment on these assessments for D7.	The Applicant confirms that the little gull assessment submitted at Deadline 6 (REP6-024) included figures for East Anglia ONE North and East Anglia TWO as requested by Natural England. The Applicant has provided a response to Natural England's deadline 7 submission on the updated cumulative and in-combination assessment (REP7-047) in ExA.AS-3.D8.V1.
EIA impacts of Norfolk Boreas cumulatively – collision risk	Gannet The Applicant considers that the approach Natural England has taken in reaching a conclusion that a significant cumulative impact cannot be ruled out due to collisions is overly precautionary. The PVA prediction (REP2- 035) was that the population growth rate could be reduced by up to 0.8%. To provide a measure of what this level of reduction could mean for the population the Applicant has compared it to the recent growth rate of the population (2-3%), on the basis that this is the most robust current indication of the status of the population to use. On this basis the Applicant concluded that the cumulative impact would not have a significant impact on the population. Natural England disagrees with this conclusion on the basis that the population may not continue to grow at this rate. While this is undeniable, it remains the	Gannet: Natural England's position regarding the uncertainty of future population trends is not a hypothetical one. The environment of the North Sea is likely to be significantly modified by anthropogenic impacts in the coming decades, most notably warming of sea temperatures due to climate change and the associated shifts in gannet prey distribution and availability, and the expected delivery of fisheries management changes such as the ending of 'discarding' practices, gannet being known to take advantage of discarded fish. These factors have significant potential to affect gannet productivity and therefore the potential for population growth. In this context, and given the uncertainty around the level of cumulative collisions and their influence on the	<u>Gannet, kittiwake and great black-backed gull population trends</u> The Applicant acknowledges Natural England's comments on possible future population trends for these species but notes that the mechanism suggested by Natural England implies density dependent responses to changes in prey availability. However, this contrasts with Natural England's advice that impact assessment is based on the more precautionary predictions from density independent models. Therefore the Applicant considers that Natural England are assessing the outputs of the density independent models against predictions of change based on density dependent

Summary of Submission	Applicant's Comments at Deadline 4	Natural England's Comments at Deadline 7	Applicant's Comments at Deadline 8
	<p>case that the best predictor of the future (and indeed the basis of all models designed to predict the future such as PVA) is the past, and more specifically the recent past. Thus the Applicant considers that Natural England is applying an approach to the interpretation of the PVA outputs which can never be countered (i.e. that the future is unknowable and could be worse than the model prediction) and fails to take account of the fact that the most reliable predictor of the future is the recent past.</p> <p>Kittiwake The Applicant considers that the approach Natural England has taken in reaching a conclusion that a significant cumulative impact cannot be ruled out due to collisions is overly precautionary and also fails to acknowledge the counterfactual aspect of the analysis. The PVA prediction (REP2-035) was that the population growth rate could be reduced by up to 0.6%. Natural England has considered this against the approximate 40% decline in European kittiwake populations over the last 39 years and reached a conclusion that this magnitude of decline in growth rate is therefore significant. However, the observed kittiwake population declines are not due to wind farm collision mortality. The annual decline (to achieve a 40% reduction over 39 years) is approximately 2.3% per year, which is almost four times the maximum predicted decline for the smaller biologically defined minimum population scale (BDMPS) and over 20 times that for the biogeographic population scale (growth rate reduction of 0.11%), and the latter is arguably the</p>	<p>population, Natural England considers it entirely reasonable to assert that the UK gannet population may not continue to grow at current rates.</p> <p><u>Kittiwake:</u> Natural England is not suggesting that wind farm collisions are driving the kittiwake population declines currently being recorded. Our conclusions relate to the additional impact of cumulative collisions of windfarms in the context of a population already experiencing significant stresses. The likely changes to the North Sea environment described for gannet are also highly relevant for kittiwake, which as a surface-feeder may be more likely to be affected by climatic changes and changes to discards due to their inability to penetrate the water column as far as diving seabirds. It is worth noting that kittiwake is a Red-listed Bird of Conservation Concern (BoCC4, Eaton et al. 2015) as a result of severe population declines in the UK.</p> <p><u>Great black-backed gull (GBBG):</u> At a UK level the GBBG is an Amber listed bird of conservation concern (BoCC4, Eaton et al. 2015) due to moderate declines in both the breeding and non-breeding populations. Any additional mortality from the wind farms should be considered in the context of and in addition to that population decline.</p>	<p>responses. The Applicant believes that this is another example of over-precaution in the assessment, in this case through an inconsistent comparison of more precautionary density independent model predictions against more precautionary (implied) density dependent predictions of how the populations may change in the future.</p>

Summary of Submission	Applicant's Comments at Deadline 4	Natural England's Comments at Deadline 7	Applicant's Comments at Deadline 8
	<p>more appropriate comparison at the European scale. Thus, while it is not disagreed that kittiwake populations are in decline, the potential maximum contribution to this is relatively small and in this context the Applicant was able to conclude the cumulative impact of wind farm collisions was not significant. Furthermore, while in the case of gannet Natural England disputed a suggestion the population may continue to grow at the recent rate, the same could equally be argued of kittiwake, that the recent trend may not be maintained and population growth cannot be ruled out.</p> <p>Great black-backed gull The Applicant presented predictions that the cumulative great blackbacked gull collisions could result in population growth rate reductions of up to 1.4% for the BDMPS population or 0.55% for the biogeographic population. Against a backdrop of relative stability in this population (REP2-035) the Applicant considered these reductions would be so small they would have an undetectable effect on the population and therefore no significant impact would result. While Natural England has stated that the predicted effects have the potential to give rise to significant effects, the Applicant considers that very little evidence has been presented in support of this position in REP4- 040 and therefore the Applicant considers that no significant effect remains a robust conclusion.</p>		
EIA impacts of Norfolk Boreas cumulatively –	The Applicant welcomes Natural England's agreement that Norfolk Boreas' contribution to the cumulative displacement of red-throated diver is small at 0.1%, although the Applicant would	<u>RTD:</u> Natural England notes that the apparent increases in RTD numbers may well be linked to changes in survey platform, i.e. from aerial	<u>Red-throated diver</u> The Applicant agrees that red-throated diver are displaced by offshore wind farms and indeed has suggested a similar

Summary of Submission	Applicant's Comments at Deadline 4	Natural England's Comments at Deadline 7	Applicant's Comments at Deadline 8
<p>displacement risk Red Throated Diver</p>	<p>suggest that in fact the project's contribution is extremely small. Furthermore, the Applicant disagrees with Natural England's conclusion (of a significant impact) for the following reasons. The like-for-like assessment of this impact (REP2- 035) has demonstrated that 84% of the total impact is due to operational wind farms. During the period these wind farms have been installed, surveys of the region for this species have reported that the population has trebled in size from around 6,000 individuals to over 18,000. The Applicant considers that these highlight there is a large degree of over-precaution in Natural England's approach to this assessment, since impacts of the magnitude suggested (100% displacement and 10% mortality) would appear to be incompatible with a population which has grown considerably in spite of such effects apparently occurring. Thus the Applicant considers that there will be no significant cumulative displacement impact for red- throated diver.</p> <p>Guillemot and Razorbill The Applicant welcomes Natural England's agreement that most wind farms in the cumulative assessment are located in regions of lower importance to auks and that as a consequence mortality of displaced birds will be at the lower end of the 1%-10% range that is advised. The Applicant considers that Natural England's position is therefore not that different from its own. Furthermore, the Applicant has presented evidence in support of the rates used in the assessment (50% displaced and 1% mortality) which also explained</p>	<p>visual to aerial digital surveys, as has been the case for the Outer Thames Estuary SPA surveys, which the figures the Applicant refers to are for. We know there is an underestimate from visual aerial methods, linked to disturbance of this sensitive species. It is also likely that at high RTD densities, detection rates are higher for digital aerial surveys than from aerial visual surveys. As there is no preconstruction baseline corrected for the underestimates of visual aerial surveys, it is not possible to say whether there has been an increase in RTD numbers. However, we certainly know there is displacement of RTDs from offshore wind farms as the digital aerial surveys of the Outer Thames Estuary SPA demonstrate gaps in RTD distribution where offshore wind farms are located.</p> <p><u>Auks:</u> We note that whilst Natural England may have indicated that mortality of displaced auks is likely to be at the lower end of the 1-10% range that is advised, this does not mean agreement that 50% displacement and 1% mortality is the appropriate impact level to consider. We again note that evidence for levels of auk displacement is variable and likely to be site and state specific, and accordingly we advise that a range of displacement rates are considered. We also note that empirical evidence regarding the energetic consequences of displacement for seabirds and wintering waterbirds using the marine environment are</p>	<p>rate (90%) as Natural England (100%). Therefore the Applicant does not consider this aspect of the assessment to be an area of more than very minor disagreement with Natural England. However, on the matter of the consequence of displaced birds the Applicant and Natural England are in disagreement. The Applicant considers that mortality of displaced birds is likely to be very low, at no more than 1%, while Natural England consider this to potentially be up to 10%. In this context, the population size in the southern North Sea and the apparent trend in this population since 2006 is very relevant.</p> <p>The Applicant acknowledges that the increase in the estimated population may be related to changes in survey methods and improvements in detection. However, it seems highly unlikely that this would account for the three-fold population increase observed. Furthermore, applying Natural England's displacement mortality of 10% for displaced birds would suggest the opposite trend should have been observed over this period due to the operational wind farms. For example, on the basis of Natural England's preferred methods and the cumulative estimates in the like-for-like assessment (REP2-035) it would be estimated that around 250</p>

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	<p>why these retain precaution (REP2-035). Consequently the Applicant does not agree with Natural England that there will be a significant cumulative displacement effect for these species, since the evidence based assessment indicates much lower impact magnitudes.</p>	<p>very limited, and the role of overwinter survival on seabird population dynamics is poorly understood. Therefore as there is very little information available about the consequences of displacement for individuals, there is actually no evidence to suggest that 10% is precautionary. Furthermore, we note that the mortality rates are a crude method of capturing a range of potentially deleterious effects that could arise from displacement, including reduced fitness for migration and reduced productivity during the breeding season. These are particularly relevant when considering displacement effects within sites designated for the species affected. For cumulative displacement of razorbills and of guillemots, for all projects excluding Hornsea 3 and Hornsea 4, the predicted mortality exceeds 1% of baseline mortality for the largest BDMPS at between 40% and 50% displacement at 2% mortality (and between 30-40% displacement and 2% mortality when Hornsea 3 and Hornsea 4 are included in the cumulative totals). Therefore, we have advised that a significant adverse impact cannot be ruled out for displacement of both auk species for cumulative displacement.</p>	<p>birds would have died each winter since 2006 due to displacement (i.e. over and above natural mortality). On this basis, if it is assumed that all else being equal this population has remained stable, the population in 2006/7, rather than being 6,500 as recorded at the time, would need to have been in excess of 21,000 individuals in order to have declined to the more recent estimate in 2018. Thus, it would seem that either the earlier counts were underestimated by a very large degree, or the mortality rate for displaced birds advised by Natural England is very substantially over estimated (or potentially both).</p> <p><u>Auks</u></p> <p>The Applicant continues to consider that the displacement (70%) and mortality rates (up to 10%) applied by Natural England are over precautionary and disagrees with the conclusions that Natural England has reached on the cumulative assessment for guillemot and razorbill. The Applicant considers the evidence based rates of 50% and 1% are appropriate (see the submission for Norfolk Vanguard submitted to the Norfolk Boreas examination as an appendix to REP2-035). On this basis the Applicant considers that cumulative displacement will not result in a</p>

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			significant impact on either guillemot or razorbill.
EIA impacts of Norfolk Boreas cumulatively – displacement and collision risk combined (gannet)	The same arguments made above in relation to gannet cumulative collision risk apply to this aspect of the assessment since displacement makes a very small contribution to the total.	See comments on gannet above.	See response above.
HRA			
HRA Impacts of Norfolk Boreas – overall	The Applicant welcomes Natural England's agreement with the Applicant that the project alone will have no adverse effects on the integrity (AEoI) of any Special Protection Area (SPA) populations (noting that includes the Applicant's commitment to mitigation with respect to red-throated diver disturbance during cable installation and resulting from vessels involved in the project's operation and maintenance). Nonetheless, the Applicant has continued to explore options for reducing impacts through design mitigations, with an increase in draught height of at least 8m (from 22 m to 30m above MHWS for wind turbines of 14.7MW and above and of at least 13m for wind turbines of up to 14.6MW) and removal of turbine models of less than 11.55MW from the design envelope. The updated collision assessment for these changes has been submitted at Deadline 5 (ExA.AS-8.D5.V2). In addition the Applicant welcomes Natural England's agreement that the project, in-combination with other plans and projects (when Hornsea Project Three and Hornsea Project Four are excluded), will not result in any AEoI for SPA populations, with the exception of kittiwake from the Flamborough and Filey Coast	Natural England welcomes the mitigation considered by the Applicant in their D5 submission and we have provided detailed comment in our Deadline 7 submission (NE.NB.D7.08 CRM). With regard to the in-combination assessments and total figures including Hornsea 3 and Hornsea 4, we note that Natural England's advice throughout the Hornsea 3 Examination regarding offshore ornithology issues was that insufficient baseline survey data had been collected in order to allow Natural England to make conclusions regarding the impacts of the proposal on a number of qualifying features of seabird SPAs. Without the ability to advise on, and therefore rule out, adverse effects on integrity (AEoI) from the project alone, it inevitably followed that we would also be unable to advise on, or rule out, AEoI, when considered in-combination with other plans and projects. In contrast, sufficient offshore ornithology baseline survey information had been collected by the Norfolk Boreas Applicant to allow us to draw conclusions regarding the impacts of the project alone on the relevant SPAs. It is	The Applicant welcomes Natural England's confirmation that Norfolk Boreas has collected the appropriate data to permit Natural England to assess the project's impacts alone and in-combination with other projects (with the exception of when Hornsea Project Three and Hornsea Project Four are included, as has been noted). As stated by Natural England, it is therefore the uncertainty in the in-combination assessments due to the inclusion of Hornsea Projects Three and Four, which has prevented Natural England from reaching conclusions on some of the in-combination impacts, and this uncertainty has been introduced by projects outside the Applicant's control.

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	<p>SPA and lesser black-backed gull from the Alde-Ore Estuary SPA. These are discussed in more detail below. With respect to Natural England's conclusions where AEoI can be ruled out without Hornsea Project Three and Hornsea Project Four, but cannot be ruled out with these wind farms included (gannet, razorbill, guillemot and assemblage from Flamborough and Filey Coast SPA and little gull from the Greater Wash SPA), the Applicant notes that Natural England state these relate to their 'significant concerns' regarding the data used in the assessment of Hornsea Project Three and the preliminary nature of the figures for Hornsea Project Four. Thus, Natural England's conclusions appear to relate to the uncertainty that is introduced when these projects are included rather than to the actual in-combination impact magnitudes as presented. It was for this reason that the Applicant has presented in-combination impacts with and without the Hornsea wind farms and as advised by Natural England.</p>	<p>therefore also possible to properly consider the extent of in-combination impacts with other plans or projects. However, this has proved problematic when trying to incorporate the impacts of Hornsea 3 into this assessment, given the significant lack of confidence in the baseline data collected (this was also the case for the Norfolk Vanguard project). In addition, the best currently available figures for Hornsea 4 are those from the PEIR for this project. These figures and the methodologies to produce them are hence subject to ongoing discussions through the evidence plan process and therefore have an element of uncertainty associated with them and a likelihood of being subject to change. For example, the CRM figures presented in the Hornsea 4 PEIR were undertaken using the stochastic CRM, and therefore are potentially affected by the issues that have been noted with this model. We therefore welcome that the Applicant has presented in-combination assessments that both include and exclude Hornsea 3 and Hornsea 4. These have clarified that for some SPA qualifying features, it is possible to rule out an AEoI in-combination when Hornsea 3 and Hornsea 4 are excluded from the assessment. However, as there is uncertainty in the figures included in the in-combination assessment totals for Hornsea 3 and Hornsea 4, it follows that there will be uncertainty in the assessment totals presented when these two projects are included. Therefore it inevitably follows that we would also be unable to advise on, or rule out,</p>	

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		<p>AEOL, based on the actual in-combination impact magnitudes as presented when Hornsea 3 and Hornsea 4 are included in the totals.</p>	
<p>Flamborough and Filey Coast SPA – Kittiwake</p>	<p>The Applicant disagrees with the basis for Natural England's conclusions on the potential that in-combination collisions would have an AEOL because this fails to take into account the reduced mortality for built wind farms compared with the consented designs and the Applicant also considers that the conservation objective for this population has been derived from erroneous data (as discussed in REP2-035). Thus, while Natural England considers that that target is a population of 80,000 pairs, there is robust evidence that the population has never been that large and that this is almost certainly unachievable. When this is taken into account, and the revised target is to maintain the population around its current size (i.e. between 40,000 and 50,000 pairs) it can be seen that the Applicant's PVA predictions would permit such an outcome, even including the sources of precaution inherent in the assessment.</p>	<p>With regard to as built wind farms and consented designs and the potential for reduced predicted cumulative/in-combination collision mortality, as has been previously stated, Natural England acknowledges that this is an important issue with regard to cumulative/in-combination collision risk modelling (CRM) predictions and assessments. However, there are significant issues associated with adjusting the collision predictions for projects included in the cumulative/in-combination assessments, as set out in our Deadline 6 response [REP6-049] to the Applicant's REP4-014. Therefore, as discussed during ISH 4 and set out in REP4-043 and REP6-049, Natural England has been raising the issue of whether as built or consented projects should be considered for in combination effects with The Crown Estate, and we note the need for a strategic approach to this issue. If conducted simply on a project-by project basis this has significant risks of inconsistency of approach across applications. Therefore, we consider that this issue needs to be addressed strategically on behalf of the whole sector, including developing consensus on an approach. However, we do recognise that this is not possible in the timescale for the Norfolk Boreas examination. Conservation objective: As noted in our Deadline 4 response [REP4-040] Natural England notes that the topic of the</p>	<p>The Applicant welcomes Natural England's agreement that headroom in cumulative and in-combination assessments is an issue and that Natural England has raised this issue with The Crown Estate. While acknowledging that Natural England does not consider that it is currently possible to state how much headroom is currently 'locked up' in existing wind farm consents, the Applicant considers that it is possible to state with a high degree of confidence that this figure will more than exceed the collision predictions for the Norfolk Boreas wind farm (and has in fact demonstrated that freeing up headroom from only two projects, Hornsea Project One and Triton Knoll, can yield this for Norfolk Boreas and Norfolk Vanguard). Therefore, whilst agreeing with Natural England that a strategic approach is appropriate, the Applicant has demonstrated this conclusively at this stage using only two projects. Therefore, there is no doubt such strategic work would confirm this situation, and therefore that Norfolk Boreas (and Norfolk Vanguard) can be consented with confidence and no risk that the in-combination totals will exceed those for previously consented projects.</p>

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		<p>1987 estimate has been discussed in detail previously during the Hornsea 2 Examination in our Deadline 4 and Deadline 6 submissions for this examination. During the examination for Hornsea 2, JNCC and Natural England reviewed in detail the actual count forms from 1987 and as a result JNCC are happy for this count to be included in the Seabird Monitoring Programme (SMP) database as a legitimate count. Natural England has accepted this and this count has been used for all statistical analysis and reporting for the colony, and hence was used in setting the conservation objective target. The target for the 'breeding population: abundance' attribute for this species is to restore the population to 83,700 breeding pairs at this site and therefore the conservation objective for the SPA should be to restore the kittiwake population. It is this target that should be considered in the assessment when judging the significance of predicted impacts against the conservation objectives for this feature. For more information see Supplementary Advice on Conservation Objectives available here. Please note that the draft conservation advice package has undergone a public 'invitation to comment' consultation.</p>	<p>The Applicant acknowledges Natural England's position on the disputed kittiwake counts at Flamborough and Filey Coast SPA made during the 1980s. However, the Applicant maintains that significant doubts have been raised about the veracity of the two counts which reported in excess of 80,000 pairs and therefore considers that the same doubts apply to their use in setting conservation objectives for the SPA.</p>
Alde-Ore Estuary SPA – Lesser black backed gull	The Applicant disagrees with Natural England's basis for concluding that the in-combination mortality of lesser black-backed gulls will result in an AEoI because this fails to take into account the reduced mortality for built wind farms compared with the consented designs and that the status of the gull population has been much more strongly	Please see our comments on kittiwake above regarding as built wind farms and consented designs and the potential for reduced predicted cumulative/in-combination collision mortality. Whilst the gull population at the site may have been impacted by changes in local farming practice and predation at the colony, as the site	The Applicant refers to previous responses in relation to headroom which are also applicable to this species. The Applicant welcomes Natural England's agreement that the project alone collisions have reduced mortality, to 2.1 (using Natural England's methods

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	<p>influenced by changes in local farming practice and predation at the colony. Against this population context, the Applicant considers that the estimated (and precautionary) incombination mortality will not result in an AEoI. In addition, the Applicant's contribution to the in-combination total has been further reduced by 64% following the project design revisions (with a revised worst case turbine of 14.7MW and minimum draught height of 30m from Mean High Water Springs). As a consequence the predicted collision mortality apportioned to the SPA population from Norfolk Boreas is now between 1.5 (Applicant's apportioning rate) and 2.1 (Natural England's apportioning rate), reduced from 4.3 and 6 respectively as estimated for the original project design. The revised collision estimates represent less than 4% of the total in-combination estimate</p>	<p>population has seen significant declines and hence has a restore conservation objective, any additional mortality from the wind farms should be considered in addition to any existing impacts. We welcome the Applicant's design revisions and revised worst case scenario and increase to draught height. Natural England will respond to the updated CRM for these revisions submitted by the Applicant in REP5-059 at Deadline 7. We note that Natural England has already advised (at Norfolk Vanguard) that it was not possible to rule out an adverse effect on integrity on the Alde-Ore Estuary SPA from operational and consented projects due to the level of annual collision mortality predicted for LBBGs. There is the potential for the Norfolk Boreas proposal to make a contribution to the overall collision mortality total. Whilst the Norfolk Boreas alone contribution to the total will have decreased following the design revisions compared to that at the point of submission, based on the figures presented here by the Applicant, the project still makes a relevant contribution (2 birds per annum) to the total based on the revised worst case scenario.</p>	<p>and 1.6 using the Applicant's). However the Applicant disagrees with Natural England's description that a mortality of 2 can be described as a 'relevant contribution' to the total of 54. Especially since Natural England has agreed that assuming 30% of the breeding season collisions at Norfolk Boreas are birds from the Alde-Ore Estuary SPA is precautionary. On this basis it follows that the collision mortality is more likely to be less than 2 (i.e. closer to the Applicant's estimate of 1.6) and raises the question of how small the project's mortality would need to be for Natural England to not consider it to be a 'relevant' contribution.</p>
<p>Greater Wash SPA and Outer Thames Estuary SPA – Redthroated diver</p>	<p>The Applicant welcomes Natural England's agreement that AEoI can be ruled out for red-throated diver displacement at the Greater Wash SPA and Outer Thames Estuary SPA as a result of the mitigation that the Applicant has agreed to put in place (restrictions on both cable installation and the movement of vessels involved in operation and maintenance through the Greater Wash SPA), as</p>	<p>We welcome the Applicant's commitment to securing this mitigation in the DCO.</p>	<p>The Applicant welcomes Natural England's assistance in agreeing this mitigation and that the resultant impacts are sufficiently small for adverse effects on integrity of the Greater Wash SPA and Outer Thames Estuary SPA to be ruled out.</p>

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	<p>secured in the DCO: · Generation DMLs beneath the Project Environmental Monitoring Plan (PEMP) - Condition 14(1)(d)(vi) of Schedule 9 and 10 which reads as follows: (vi) procedures to be adopted within vessels transit corridors to minimise disturbance to red-throated diver during operation and maintenance activities. · Transmission DMLs at Condition 19 of Schedule 11 and 12, as follows: Restriction on cable installation construction works 19. During the months of January to March inclusive, construction activities consisting of cable installation for Work No. 4A and Work No. 4B must only take place with one main cable laying vessel.</p>		

3 Natural England's Response to Applicant's Responses to Examining Authority's Further Written Questions

Table 3.1 The Applicant's Comments on Natural England's Response to the Applicant's Responses to the Further Written Questions [REP7-046]

PINS Q.	Question Addressed to:	Question:	Applicant's Response at Deadline 5	Natural England's Response at Deadline 7	Applicant's Comment
2.2.0.5	The Applicant, Natural England, Marine Management Organisation	Marine Mammal Monitoring: Natural England, MMO and Applicant to provide an update regarding drafting of a condition for marine mammal monitoring	The Applicant's position is that given the low contribution of the project to marine mammal impacts any marine mammal monitoring should be undertaken at a strategic level. The wording provided within the IPMP allows for the participation of Norfolk Boreas in any strategic monitoring as required at the time of agreement of the final plans and therefore it is not necessary to include a specific condition within the DCO to commit the Applicant to marine mammal monitoring specifically. Furthermore, it is not appropriate to include a condition requiring a strategic approach to monitoring if equivalent conditions are not included within DCOs for other wind farm developments within the vicinity of Norfolk Boreas, which can contribute to that strategic approach. The Applicant is not aware of any other DCOs including such a condition. Therefore, if the Applicant were to include such a condition it could put the project in the position of having to undertake strategic monitoring without the participation of other projects. Notwithstanding this position the Applicant has discussed this with the MMO and Natural England (17th February 2020) and have agreed to consider proposed wording for a potential condition which will be provided by Natural England (in consultation with the MMO) for Deadline 6	Natural England advise that text such as that suggested below be included within conditions and linked to the IPMP. <i>Pre-construction monitoring condition</i> Appropriate surveys of existing marine mammal activity required to test predictions in the environmental statement concerning key marine mammal interests of relevance to the authorised scheme. <i>Post-construction monitoring condition</i> Appropriate marine mammal surveys required to test predictions in the environmental statement concerning key marine mammal interests of relevance to the authorised scheme.	The Applicant does not consider that a condition for monitoring of marine mammals in appropriate. Please see the Applicant's response to WQ3.2.0.1. [Applicant's Responses to the Examining Authority's Third Round of Written Questions REP7-017] which explains the Applicant's reasoning.
2.2.2.1	The Applicant	Population Viability Analysis: Can the Applicant either rerun the EIA scale PVA for gannet, kittiwake, Lesser Black Backed Gull and Greater Black Backed Gull for the Biologically Defined Minimum Population Scale and biogeographic population scales using the updated Natural England commissioned Seabird PVA tool [REP4-040] or provide justification as to why this isn't necessary.	The Applicant has discussed the planned updates to the Population Viability Analysis (PVA) with Natural England. It has been confirmed by Natural England that these will be delayed until the end of February at the earliest (these were originally due mid-January 2020). Natural England has also confirmed that their internal testing of the updated PVA has found the results (compared to the original version as used by the Applicant and reported in REP2-035) are not materially different and therefore the existing counterfactual estimates are robust and appropriate for assessment and Natural England will refer to these when reaching conclusions (so long as the models have been run using parameters as advised by Natural England). Therefore, the Applicant proposes to attempt to rerun models where Natural England has indicated insufficient simulations were conducted (i.e. fewer than 1,000). However, it may be that the Applicant encounters the same issues as previously (i.e. the model failed to run with larger number of simulations), in which case this will be discussed with Natural England and a note submitted. The species and populations for which model re-runs for more simulations were requested were: kittiwake at the North Sea scale (CIA) and guillemot at the Flamborough and Filey Coast SPA scale.	Natural England advised the Applicant (in an email dated 03/03/2020) that version 2 of the PVA Tool has been uploaded. A link to the new version was sent to the Applicant. We noted that the guidance documents etc. had also been updated and were available from the links sent to the Applicant. Therefore, we welcome the commitment from the Applicant that they propose to re-run the models where Natural England has indicated insufficient simulations had been conducted. We also advised the Applicant that there is a bug in version 2 which is affecting the annualised growth rates presented in the full table of outputs – however this is only an issue for the year prior to the impact being added. The bug doesn't affect any of the other metrics – it is just affecting the way the table presents values for the run of years prior to when an impact is added. Furthermore, if the tool is run with respect to a baseline population it doesn't affect the table outputs for this. Finally, it is noted that when the model is run with an impact, it doesn't affect the annualised growth rate calculations in the full table of outputs for the period when the impact is applied.	The Applicant confirms that outputs from the revised PVA model from simulations with 1,000 and 5,000 iterations were presented at Deadline 7 (REP7-031) for those examples where previously it was only possible to successfully undertake smaller runs of 500 simulations (kittiwake EIA and guillemot for Flamborough and Filey Coast Special Protection Area; REP2-035). The additional outputs have demonstrated that there is virtually no difference in the counterfactual metrics with 500, 1,000 and 5,000 simulations. The largest difference obtained between 500 and 5,000 simulations was 0.14%, while most differences were at least an order of magnitude smaller (i.e. <0.01%). Furthermore, the outputs for 500 simulations were obtained using the original version of the PVA model (REP2-035) while those in the Deadline 7 submission (REP7-031) used the updated version. Therefore, not only do the additional simulations make no material difference to the counterfactual metrics, but also the PVA model updates have made no difference to these metrics. This corresponds with Natural England's finding, noted in REP5-077: <i>'...we are not aware that the updates will make a significant difference to the counterfactual metric outputs of models run using the previous/currently available version</i>

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					<p>of the tool. This conclusion is on the basis that the testing undertaken has not thrown up any significant issues with the tool. Therefore, we will use the counterfactual of population size (CPS) and counterfactual of growth rate (CGR) metric outputs from models run by the Applicant using the previous version of the tool as presented in the Deadline 2 updated assessments [REP2-035], provided these are set-up and parameterised in the way we have advised (i.e. sufficient simulations etc.) in our Deadline 4 response [REP4-040].'</p> <p>This response also applies to the other references to PVA made by Natural England in REP7-045, REP7-52, REP7-048, REP7-047 and REP7-053, which reiterate the same comments regarding the version of the PVA used and the number of simulations on which the outputs are based.</p> <p>Thus, the Applicant considers that the PVA reported in REP2-035, supported by the additional modelling in REP7-031 (as requested by Natural England), means that all the PVA modelling has been conducted in accordance with Natural England's advice on set-up and parameters. As such the Applicant is of the understanding that this matter is now resolved and no further PVA or discussion is required.</p>
2.5.3.5	The Applicant	<p>Requirements 18 and 24: The responses to Q9.3.2, Q9.3.3, Q9.3.4 and Q9.3.5 raise uncertainties regarding how the hedgerow replacement planting would be approved and secured. The response to Q9.3.4 says it would be via the Hedgerow Mitigation Plan which is a part of the Ecological Management Plan (EMP), secured via R24 and the response to Q9.3.5 states it would be via R18. The Schedule of Mitigation [REP2- 006] shows R18, R19 and R24. 1. The Applicant to provide clarity on what it considers would be approved by which plan. 2. The ExA considers that clarity on this needs to be given in the dDCO, Outline plan(s) and the Schedule of Mitigation.</p>	<p>1. Hedgerow replacement planting is secured through Requirements 18, 19 and 24. Requirements 18 and 19 relate to landscape mitigation and the production of a Landscaping Management Scheme (in accordance with document 8.7 Outline Landscape and Ecological Management Strategy) which will provide details of all planting removed and the location, number, species, size and planting density of the proposed replacement planting to mitigate landscape effects. Requirement 24 relates to ecological mitigation, which includes hedgerow planting to replace hedgerow habitat that has been removed. A Hedgerow Mitigation Plan, which will sit as part of the final Ecological Management Plan, will detail the reinstatement approach specific for replacement of hedgerow habitat and any monitoring and maintenance requirements. As such the details of the hedgerow replacement will be captured in both the Landscape Management Scheme and the Hedgerow Mitigation Plan (part of the final Ecological Management Plan) to ensure it meets the requirements in terms of landscape mitigation and ecological mitigation as the replacement has a dual purpose. There will be collaborative working between both the landscape and ecological specialists to ensure the hedgerow replacement satisfies all requirements.</p> <p>2. Text clarifying this has been added to the updated OLEMS submitted at Deadline 5, [Document 8.7, Version 3].</p>	<p>It is not currently clear how those commitments in the clarification Note Ecological Enhancement have been included in the OCOCP or OLEMS. In particular in relation to different planting specifications. Given the number of Ex A WQ in relation to hedgerows and the number of overlapping documents Natural England suggest that an Outline Hedgerow Mitigation Plan is submitted as part of DCO to ensure that all commitments made within various documents can be implemented without any contradiction.</p>	<p>Please refer to the response to REP7-044, in the Applicant's Comments on Deadline 7 Submissions [ExA.ASR.D8.V1], which states that the appropriate controls with regards to hedgerow removal are secured through the OLEMS and therefore it is not necessary to produce an outline hedgerow mitigation plan.</p>

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2.8.3.1	The Applicant, Natural England, Marine Management Organisation	Sediment disposal: Applicant, MMO and Natural England to provide update on discussions relating to the wording of a condition for sediment disposal.	This was discussed with the MMO and Natural England on the 17th February. Currently neither the MMO nor Natural England have been able to provide an example of such a condition. The Applicant is confident that the additional mitigation proposed to ensure that sediment is disposed of as close to its origin as possible negates the requirement for such a condition. The mitigation as stated in the outline HHW SAC SIP [REP1-034] site integrity plan is: <ul style="list-style-type: none"> · Dispose of any material dredged from the seabed for sandwave levelling (also referred to as presweeping) in a linear "strip" along the cable route. · Dispose of material as close as possible to cable route (and therefore as close as possible to where it was dredged from · Dispose of material updrift of where it was dredged from to allow infill through natural processes. · Dispose of material close to the seabed. This will be achieved through the use of fall pipe (also referred to as a down pipe) employed by the dredging vessel. The MMO response at Deadline 4 [REP4-35] states: The MMO agreed with the Applicant and Natural England on the details of where the material will be disposed of and how the Applicant will provide details of the disposal locations. And the MMO understands Natural England have ongoing concerns in relation to particle size and will continue discussions on the practicalities and potential wording of a condition. 	Please be advised that the proposed mitigation does not ensure that the sediment will be disposed of in areas of similar particle size. Therefore we do not agree with the Applicant's response to the ExA question. Discussion of potential wording of a condition regarding sediment size is ongoing.	The Applicant does not consider that a condition relating to particle size is appropriate. Please see the Applicant's comment on the MMOs response to WQ3.2.0.2 [Applicant's Comments on Responses to the Examining Authority's Third Round of Written Questions ExA.WQR-3.D8.V1] which explains the Applicant's position and provides an update on discussions with Natural England on this issue.
2.8.3.4	The Applicant	Cable protection: The Applicant [REP4-014] committed to "no cable protection in the priority areas to be managed as reef within the HHW SAC". How is this secured?	The Outline HHW SAC SIP (Document 8.20) has been updated and submitted at Deadline 5 to include this commitment. Section 5.5.3 (Total area and Volume of Cable Protection in the SAC) and Table 5.2 (overview of mitigation commitments) now contain the following: <i>"Norfolk Boreas Limited has made a commitment to install no cable protection in the priority areas to be managed as reef within the HHW SAC, unless otherwise agreed with the MMO in consultation with Natural England."</i>	Natural England welcomes the inclusion of the commitment; however we disagree with the use of the term 'priority areas' as set out in previous Written Representations.	Natural England referred to these areas as "top priority sites" within Appendix 2.2 of its Relevant Representation [RR-099]. The Applicant has made every effort in recent documents to clarify that these are areas in which Natural England have higher confidence that reef can recover.
2.8.3.5	The Applicant, Marine Management Organisation	Monitoring sandwave recovery: The SoCG with the MMO [REP2-051] highlights a disagreement regarding the need for monitoring of sandwave recovery following sweeping. Applicant and MMO to provide an update	This has been discussed between the Applicant and the MMO at a number of meetings, most recently on the 17th February where it was agreed that this matter is now resolved in the Statement of common ground. The MMO are satisfied that due to the inclusion of the following text within the IPMP there is sufficient security that sand waves will be monitored to ensure that recovery has occurred: <i>"further surveys may be required at a frequency to be agreed with the MMO (e.g. 3 years non-consecutive e.g. 1, 3 and 6 years or 1, 5 and 10 years). If evidence of recovery is recorded and agreed with the MMO, monitoring will cease"</i>	Natural England agrees.	The Applicant has no further comment.
2.8.3.6	The Applicant	Site Integrity Plan: Without prejudice to the ExA's recommendation, the Applicant to comment on Natural England's suggestion [REP4-041] to amend condition 9(1)(m) of Schedules 11 and 12 of the dDCO. Are there any concerns regarding the implementation of such an amendment, irrespective of whether the ExA recommends an AEOI can or cannot be ruled out?	The Applicant has provided a full response to Natural England's position paper [REP4-041] within the Applicant's position paper submitted at Deadline 5 [ExA.AS-6.D5.V1]. With regards to this specific issue the Applicant does not consider it necessary to change the wording of the proposed condition as suggested by Natural England. As drafted the formulation of the condition: <ul style="list-style-type: none"> • Follows an accepted approach used for mitigation relating to the Southern North Sea Site Integrity Plan, and the Applicant sees no reason to depart from this; and • Does not preclude the MMO from undertaking an appropriate assessment at that point in time if considered necessary by the MMO, but includes flexibility for the MMO by not requiring an appropriate assessment to be undertaken. 	Please see Natural England's detailed response to the Applicant Position Paper at Deadline 7 (Our Ref: NE.NB.D7.07.HHWSAC Paper)	Please see the Applicant's Comments on Natural England's response to the Position paper submitted at Deadline 8 [Applicant's Comments on Deadline 7 Submissions ExA.ASR.D8.V1].

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			In relation to this latter point, for example, to the extent that there is no or limited change in the extent and distribution of the <i>sabellaria</i> across the cable corridor at the point of construction, such that the Applicant is able to demonstrate that it remains possible to microsite the cables to avoid <i>sabellaria</i> , it would not be necessary to undertake a further appropriate assessment beyond that undertaken at the consenting stage.		
2.8.3.7	The Applicant	Consideration of Alternatives: What alternative solutions were considered by the Applicant and would any of these have avoided adverse effects on the integrity of the sites?	The Applicant's firm position is that adverse effect on integrity (AEOI) as a result of the project, both alone and in-combination, can be ruled out. However, the Applicant acknowledges that, for the Norfolk Vanguard 'sister' project, the Secretary of State has requested evidence as to whether there are feasible alternative solutions which could lessen or avoid AEOI, 'in addition, or alternatively' to further mitigation in respect of offshore ornithology impacts, and in 'the absence of any identifiable mitigation measures' in the case of impacts resulting from cable protection. The Applicant has submitted further mitigation in relation to both offshore ornithology impacts (Offshore Ornithology Assessment Update, Project Alone submitted at Deadline [ExA.AS8.D5.V1] and impacts as a result of cable protection [The HHW SAC SIP (Document 8.20 updated for Deadline 5)], which provide further confidence in the Applicant's assessment that there will be no AEOI either alone or in-combination. Notwithstanding this, the Applicant is preparing evidence for a derogation case which, in the event that the Secretary of State concludes that AEOI cannot be ruled out, will confirm that there are no feasible alternative solutions for the project which could avoid or lessen	We welcome the Applicant's further mitigation and note that it does considerably reduce the predicted collision impacts from the project. However, the project continues to make a meaningful contribution to the in-combination collision totals and our position remains that we cannot rule out AEOI from in-combination collision risk to kittiwakes from the Flamborough and Filey Coast SPA and lesser black-backed gull from the Alde-Ore Estuary SPA (for our reasoning please see REP4-040 and our D7 response (NE.NB.D7.08 CRM) to the Applicant's updated cumulative/in-combination collision totals in REP6-024). Natural England is still of the opinion that AEOI cannot be excluded for HHW SAC.	The Applicant welcomes Natural England's agreement that the project mitigation has considerably reduced collision impacts. However, the Applicant does not agree with Natural England that any contribution is 'meaningful', and is of the firm view that the project's contribution to in-combination totals for both species makes no material difference to the likelihood of AEOI and therefore cannot be described as 'meaningful' in any way. . For lesser black-backed gull from the Alde Ore Estuary SPA collisions at Norfolk Boreas even when applying Natural England's breeding season apportioning rate of 30% (which Natural England has agreed is likely to be overly precautionary, REP7-052) is 2.1 from an in-combination total of 54 (REP6-024), or 1.6 using the Applicant's apportioning rate of 21%. This is less than 4% of the total. Furthermore, the Applicant also notes that the final assessed collision impact for lesser black-backed gull from the Alde-Ore Estuary SPA for the consented East Anglia THREE wind farm (East Anglia THREE revised collision risk modelling, Table A2.3, page 35; ExA.ASR-NE.D8.V1, Appendix 3) was 1.8 individuals, for which Natural England agreed there was no risk of an AEOI (East Anglia THREE Statement of common ground, Table 5 – Offshore Ornithology, page 29, ID 6b; ExA.ASR-NE.D8.V1, Appendix 1) and the in-combination the total was 58.8, for which Natural England agreed there was no risk of an AEOI (East Anglia THREE Statement of common ground, Table 5 – Offshore Ornithology, page 29, ID 6b; ExA.ASR-NE.D8.V1, Appendix 1). For kittiwake the project contribution to the Flamborough and Filey Coast SPA in-combination total has been reduced to 14 (applying Natural England's breeding apportioning rate of 86% and 6.1 using the

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					<p>Applicant's apportioning rate of 26.1% individuals from a total of 363 (excluding the Hornsea Projects) which is similarly less than 4%.</p> <p>Furthermore, the Applicant notes that the final assessed collision impact for kittiwake from the Flamborough and Filey Coast SPA for the consented East Anglia THREE wind farm (East Anglia THREE revised collision risk modelling Table A2.2, page 33; ExA.ASR-NE.D8.V1, Appendix 3) was 7.8 individuals (for which Natural England agreed there was no risk of an AEol (East Anglia THREE statement of common ground, Table 5, page 28, ID 6d; ExA.ASR-NE.D8.V1, Appendix 1) and the in-combination the total was 319, for which Natural England stated that an AEol could not be ruled out but the contribution from East Anglia THREE, while not de minimis was so small as to not materially alter the significance or the likelihood of an adverse effect on the integrity of the SPA (East Anglia THREE statement of common ground, Table 5, page 29, ID 6f; ExA.ASR-NE.D8.V1, Appendix 1)).</p> <p>The Applicant considers that the collision risks for Norfolk Boreas are now materially very similar to those for the consented East Anglia THREE (and indeed using the Applicant's evidence-based methods are in fact lower). The Applicant has made all possible commitments, whilst retaining a viable project, (for detail see REP5-059) to ensure that the project's contribution to in-combination collision totals is as low as possible.</p>
2.8.3.8	The Applicant	Compensatory Measures: Following on from Q2.8.4.5 what compensatory measures could be proposed to ensure that the overall coherence of the network of Natura 2000 sites is protected?	As set out in response to WQ 2.8.3.7 above the Applicant is currently preparing evidence for a derogation case, in the event that the Secretary of State cannot rule out AEol, notwithstanding the Applicant's clear position that AEol can be ruled out. The Applicant is working closely with Natural England and Norfolk Vanguard Limited to agree in principle compensatory measures. Norfolk Vanguard will be providing details of in-principle compensatory measures to the Secretary of State on 28 February 2020. The derogation case being prepared by the Applicant will also include details on in-principle compensatory measures. As set out above, this will be submitted to the Examination as soon as possible.	Natural England is currently in the process of reviewing the Hornsea Project 3 and Norfolk Vanguard documents in order to provide our statutory advice to the SoS. We do not wish to prejudice our advice on either project therefore we will provide further advice on Norfolk Boreas Derogation after the 9th April HP3 deadline and the 27th April NVG deadline (i.e. Boreas Deadline 9).	The Applicant acknowledges the need for Natural England to ensure consistency across its advice. The Applicant will continue to proactively engage with Natural England with the aim of responding to Natural England's further advice (if necessary) within the examination timetable.
2.8.4.3	The Applicant	Turbine draught height: To provide an update on the consideration of raising the draught height of turbines.	The Applicant has undertaken detailed investigations into options for raising draught heights in tandem with consideration of other mitigation measures which could reduce potential collision impacts. This investigation has identified that a key constraint for the Norfolk Boreas project is the maximum height to which available	Please see our D7 response (NE.NB.D7.08 CRM) to the Applicant's updated CRM for Boreas alone	The Applicant has reviewed Natural England's comments (REP7-047) and provided responses in ExA,AS-3.D8.V1.

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			<p>construction vessels can install turbines, which, when combined with the length of rotor blade for associated turbine models, determines the draught height. The Applicant can confirm that the minimum draught height for the project has been increased from 22m to 30m (from Mean High Water Springs, MHWS) for turbines rated at 14.7MW and higher and increased to 35m from MHWS for turbines rated at up to 14.6MW. In addition, the smaller capacity turbines (10MW and 11MW) have been removed from the design envelope, with the 11.55MW now the smallest wind turbine model which could be installed. Thus, the maximum number of turbines to be installed has been reduced from 180 to 158 (11.55MW) or 124 (14.7MW). The turbine revision on its own achieves a reduction in collision impacts equivalent to an increase in draught height of 5m for the original 10MW scenario. Together these design revisions (increase in draught height and turbine model) substantially reduce collisions risks, with reductions, of 74% for gannet, 73% for little gull, 72% for kittiwake, 64% for lesser black backed gull, 63% for herring gull and great black backed gull (these are for the 14.7MW turbine at 30m which is the new project worst case option for collision risk). Details of the project alone CRM have been submitted at Deadline 5 (ExA.AS-8.D5.V2)</p>		
2.8.4.7	The Applicant	<p>Number of construction vessels: The Applicant's assessment of effects of displacement [APP-201] has assumed a maximum of two construction vessels, how is this secured?</p>	<p>The Applicant provided a response to a similar question in the Examiner's first written questions at Deadline 2 (REP2-021, Qu. 8.9.5) which is reproduced below and provides details of how this will be secured.</p> <p>Q8.9.5 The Applicant to explain how it would ensure that there would not be more than two construction vessels in use in any one nonbreeding season.</p> <p><i>In the Habitats Regulations Assessment [APP-201] the Applicant stated that the worst case impact for disturbance of red-throated diver due to cable installation through the Greater Wash SPA would result from the presence of a maximum of two main cable laying vessels during the non-breeding season.</i></p> <p><i>In the draft DCO submitted at Deadline 1 (Norfolk Boreas Updated draft DCO Version 3, REP1- 008) it has been stated at pt. (4) Condition 19: During the months of January to March inclusive, construction activities consisting of cable installation for Work No. 4A and Work No. 4B must only take place with one main cable laying vessel. This commitment in the DCO thereby ensures that during the potentially most sensitive period of the year for red-throated diver disturbance, the maximum level of impact will in fact be half that which was assessed as the precautionary worst case (of two main cable laying vessels) in the original assessment [APP-201]. Furthermore, this commitment mirrors that proposed and agreed with Natural England for Norfolk Vanguard</i></p>	<p>Please see our response to first round of ExA written questions, number 8.9.3 in REP2-080</p>	<p>The Applicant notes that this matter has now been agreed in full with Natural England and the dDCO amended to all parties satisfaction.</p>
2.8.5.1	Royal Society for the Protection of Birds, Natural England	<p>Lesser black-backed gull: The RSPB [REP3-028] would prefer a wider range of apportioning values for lesser black-backed gull during the breeding season of up to at least 40%, in order to fully capture the uncertainty inherent in the apportioning exercise and</p>	<p>The Applicant considers that the lesser black-backed gull apportioning rates already contain a high degree of precaution, given the distance between the Alde-Ore Estuary SPA and the Norfolk Boreas wind farm (minimum of 115km), and evidence available from tracking studies (it is of note that a recent review of seabird foraging ranges has recommended a reduction in the foraging range estimates for this species, from 72km to 43km for the mean range and 141km to 127km for the mean maximum range; Woodward et al. 2019). Furthermore, the Applicant considers this to</p>	<p>Please see our response to second round of ExA written questions, number 2.8.5.1 in REP2- 080</p>	<p>The Applicant acknowledges Natural England's position on this matter (REP5-077), which is:</p> <p><i>As noted in our Deadline 4 response [REP4-040], Natural England does acknowledge that a breeding season apportionment rate of 30% is likely to be overly precautionary, given the proportion of the East Anglian</i></p>

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		therefore incorporate a proportionate degree of precaution. Why is this precaution needed by the RSPB? Does Natural England have any views?	be an illustration of the over-precaution in individual elements of the assessment that results in the final estimates being over-precautionary to a potentially substantial degree (see REP4-014 for more details of the Applicant's position on this matter).		<i>LBBG population that the Alde-Ore Estuary SPA currently holds, and that there are other colonies (town colonies) located closer to Norfolk Boreas than the Alde-Ore.</i> Therefore, the Applicant and Natural England are in agreement that the assessment is already over precautionary and the Applicant considers a rate of 21% to be appropriate (REP2-035).
2.8.6.1	The Applicant, Natural England	Consideration of Alternatives: Notwithstanding the Applicant's exploration of further mitigation for in-combination effects as described at the ISH on 22 January [REP4-014], in the event that no AEOL cannot be concluded what feasible alternative solutions to avoid or lessen any adverse effects on the integrity of these sites could be considered?	The Applicant's firm position is that AEOL as a result of the project, both alone and in-combination, can be ruled out. However, the Applicant acknowledges that, for the Norfolk Vanguard 'sister' project, the Secretary of State has requested evidence as to whether there are feasible alternative solutions which could lessen or avoid AEOL, 'in addition, or alternatively' to further mitigation in respect of offshore ornithology impacts, and in 'the absence of any identifiable mitigation measures' in the case of impacts resulting from cable protection. The Applicant has submitted further mitigation in relation to both offshore ornithology impacts and impacts as a result of cable protection, which provide further confidence in the Applicant's assessment that there will be no AEOL either alone or in-combination. Notwithstanding this, the Applicant is preparing evidence for a derogation case which, in the event that the Secretary of State concludes that AEOL cannot be ruled out, will confirm that there are no feasible alternative solutions for the project which could avoid or lessen AEOL. This will be submitted to the Examination as soon as possible.	Natural England agree that AEOL can be ruled out for both kittiwake at the Flamborough and Filey Coast (FFC) SPA and lesser black-backed gull (LBBG) at the Alde-Ore Estuary SPA from Norfolk Boreas alone (see our Deadline 7 response to REP5-059) and therefore, there is no need for compensation due to Norfolk Boreas alone. However, we consider that it is not possible to rule out AEOL for either of these features due to in-combination collision mortality and that includes a contribution from Norfolk Boreas (see our Deadline 7 response to Applicant's REP6-024 on updated cumulative/in-combination collision risk). We note Natural England's advice during the Thanet Extension examination was that whilst this project made a small contribution to the in-combination collision mortality, it could not be concluded that there would be no adverse effect on the integrity of the site by the project, when considered in-combination. We welcome the commitment from the Applicant that they will be submitting into the examination evidence for a derogation case and we note our advice regarding information to include in this in our D7 response to the Applicant's derogation position statement submitted at D6 (in REP6-025).	Notwithstanding the Applicant's position that AEOL can be ruled out for the project alone and in-combination with other plans and projects, the Applicant confirms an in-principle derogation case has been submitted at Deadline 7 (REP7-024).
2.8.6.2	The Applicant, Natural England	Compensatory Measures: Following on from Q2.8.7.1 what compensatory measures could be proposed to ensure that the overall coherence of the network of Natura 2000 sites is protected?	As set out in response to WQ 2.8.6.1 above the Applicant is currently preparing evidence for a derogation case, in the event that the Secretary of State cannot rule out AEOL, notwithstanding the Applicant's clear position that AEOL can be ruled out. The Applicant is working closely with Natural England and Norfolk Vanguard Limited to agree in-principle compensatory measures. Norfolk Vanguard will be providing details of in-principle compensatory measures to the Secretary of State on 28 February 2020. The derogation case being prepared by the Applicant will also include details on in-principle compensatory measures. As set out above, this will be submitted to the Examination as soon as possible	Natural England is currently in the process of reviewing the Hornsea Project 3 and Norfolk Vanguard documents in order to provide our statutory advice to the SoS. We do not wish to prejudice our advice on either project therefore we will provide further advice on Norfolk Boreas Derogation after the 9th April HP3 deadline and the 27th April NVG deadline (i.e. Boreas Deadline 9).	The Applicant acknowledges the need for Natural England to ensure consistency across its advice. The Applicant will continue to proactively engage with Natural England with the aim of responding to Natural England's further advice (if necessary) within the examination timetable.
2.8.7.1	The Applicant	Population Viability Analysis: Can the Applicant either rerun the PVA for gannet, kittiwake, razorbill and guillemot at the FFC SPA using the updated Natural England commissioned Seabird PVA tool or provide justification as to why this isn't necessary	Please see response to Question no. 2.2.2.1 above.	Please see our response to Question 2.2.2.1 above	Please see response to 2.2.2.1 above
2.9.5.2	The Applicant, Natural England	Wording in OLEMS and OCoCP regarding buffers for ancient woodland:	1. and 2. The wording in OLEMS Version 2 [REP1- 020] has been agreed with Natural England. This position is reflected in the Natural England Risk and Issues log submitted at Deadline 3 [REP3-024] where this issue (Onshore Ecology Page 7) is identified as green	We note that OLEMS was updated D1 Para 146 Page 45 to include adhere to standing advice regarding ancient woodland. However this has not been reflected throughout the document and advise that text is also included such as 'a buffer of at least	Please refer to the response to REP7-044, in the Applicant's Comments on Deadline 7 Submissions [ExA.ASR.D8.V1] and an updated

PINS Q.	Question Addressed to:	Question:	Applicant's Response at Deadline 5	Natural England's Response at Deadline 7	Applicant's Comment
		<p>1. The Applicant to update on progress of agreeing wording to be included in the OLEMS and the OCoCP, as indicated by Natural England in its response to Q12.0.5 [REP2- 080] and the Applicant in its response to responses [REP3-003]</p> <p>2. The Applicant to update documents if agreement is reached. If not agreed, both parties to set out areas which are not resolved.</p>	<p>(Natural England supports the Applicant's approach) and Natural England state <i>'We note updated OLEMS submitted at Deadline 1 welcome that preconstruction survey mitigation will adhere to Forestry Commission and Natural England's Standing Advice.'</i></p>	<p>15m and as informed by an arboriculture survey' within Route refinement page 14 and embedded mitigation para 125.</p>	<p>OLEMS Version 4 has been submitted at Deadline 8.</p>
2.15.0.11	The Applicant	<p>Monitoring of residual adverse impacts on the water environment: What monitoring of residual adverse impacts on the water environment is proposed and how would it be secured?</p>	<p>Post-construction monitoring will be undertaken at each crossing location to identify any residual adverse impacts. This will include monitoring of the predominant geomorphological characteristics (bank form, substrate conditions, flow type, and evidence of instability, erosion or deposition) and ecological characteristics of each location. This will enable the effectiveness of the reinstatement to be evaluated, with comparison to the results of the pre-construction surveys secured under the OCoCP. The post-construction monitoring requirement will be detailed in the site specific watercourse crossing plans and the OCoCP has been updated and submitted at Deadline 5 to reflect this commitment</p>	<p>Natural England would welcome further specification on ecological monitoring and timeframes included in OCoCP, as detailed in the response to the OCoCP.</p>	<p>The details of post-construction ecological monitoring are included in the OLEMS.</p>