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Norfolk Boreas Offshore Wind Farm

Applicant's Response to Comments on the Report on the Implications for European Sites (RIES)

Applicant: Norfolk Boreas Limited
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Glossary of Acronyms

AEoI	Adverse Effect on Integrity
cSAC	candidate Special Area of Conservation
DAS	Discretionary Advice Service
DCO	Development Consent Order
dDCO	draft Development Consent Order
DEFRA	Department of Environment, Food and Rural Affairs
DML	Deemed Marine Licence
ExA	Examining Authority
HHW	Haisborough, Hammond and Winterton
HRA	Habitats Regulations Assessment
IROPI	Imperative Reasons of Overriding Public Interest
ISH	Issue Specific Hearing
LSE	Likely Significant Effect
MMO	Marine Management Organisation
NE	Natural England
OCoCP	Outline Code of Construction Practice
OLEMS	Outline Landscape and Ecological Management Strategy
OSPAR	Oslo Paris Convention
O&M	Operations and Maintenance
PEMP	Project Environmental Management Plan
pSPA	potential Special Protection Area
PVA	Population Viability Analysis
RIES	Report on the Implications for European Sites
RSPB	Royal Society for the Protection of Birds
RTD	Red Throated Diver
SAC	Special Area of Conservation
SAD	Selection Assessment Document
SCI	Site of Community Importance
SIP	Site Integrity Plan
SPA	Special Protection Area
SoCG	Statement of Common Ground
SSSI	Site of Special Scientific Interest

1 Introduction

1. This document provides the Applicant's response to stakeholders' comments on the Report on the Implications for European Sites (RIES), submitted at Deadline 9.

2. Comments on the RIES were received from the following stakeholders:

   - Natural England; and
   - Royal Society for the Protection of Birds.

3. Detailed responses are provided in the sections below.

2 Applicant's Response to Natural England's Comments

2.1 Applicant's Response to Natural England's Comments on the RIES Overview

4. Table 1 provides the Applicant's response to Natural England's comments on section 2 of the RIES.

Table 1 Applicant's Response to Natural England's Comments on Section 2 of the RIES

Section/ Paragraph	Natural's England's Comment	Applicant's Response
2.1.5	Natural England commented on the updated matrices at Deadline 7 for Broadland SPA that the screening matrices now seem to only cover the onshore project area impacts, when it previously screened in operational collision risk alone and incombination for the non-breeding qualifying features, and the matrices should be updated to include these features. During discussion with the developer on the 24th April they confirmed that this was an oversight and would be commenting on the RIES to re-include Broadland SPA offshore ornithology.	The Applicant has now reinstated the screening matrix for the Broadland SPA which was omitted in error at Deadline 7. The matrix was included as Appendix 1 of [REP9-010].
Table 2.1	The Potential effects column should include in-combination effects for birds (offshore), benthic habitats and marine mammals. In-combination effects are currently only included for fish and onshore/terrestrial.	The Applicant agrees and notes this information is provided in the Applicant's Habitats Regulations Assessment (HRA) Integrity Matrices submitted at Deadline 6 (REP6-007) and the Information to Support HRA report (document 5.3).
2.3.1	Features omitted Assessments of impacts alone were carried out by the Applicant in APP-201 for the following: • FFC SPA: gannet and kittiwake collision; guillemot and razorbill displacement • Alde-Ore Estuary SPA: lesser black-backed gull collision • Greater Wash SPA: little gull collision; red-throated diver displacement. In addition to the in-combination impacts listed in 2.3.1, the Applicant also presented in-combination assessments in APP-201 for: FFC SPA guillemot and razorbill in-combination displacement. APP-201 also included an assessment of displacement of red-throated diver at the Outer Thames Estuary SPA due to operation and maintenance vessel movements.	The Applicant has no comment on this.
2.3.2	Natural England has provided advice to the Secretary of State for Hornsea Project Three on the 22nd April 2020 and Norfolk Vanguard	The Applicant has no comment on this.

Section/ Paragraph	Natural's England's Comment	Applicant's Response
	on the 27th April 2020 (included as Appendix 2 and 3 to the this report for ease of reference). Natural England's advice in relation to Boreas Deadline 9 is provided with due consideration of this. Natural England has provided advice on in combination CRM both including and not including Hornsea Project 3 figures within our submissions at Deadline 9 and therefore subsequent to the publication of the RIES. However, it should be noted that Natural England was unable to advise on the predicted contribution of Hornsea Three to the in-combination collision risk mortality due to fundamental uncertainties in that projects base line data.	
2.3.6	Natural England advises that the methodology for in combination impact assessment is not in line with the Waddenzee judgment. If a plan or project would not be likely to have a significant effect on the site alone, it should nevertheless be considered in combination with other plans and projects to establish whether there would be likely to be a significant effect arising from their combined impacts (English Nature 2006 Report Number 704). Paragraph 2.3.6 states that in-combination effects were not assessed for the River Wensum SAC, Norfolk Valley Fens SAC and The Broads SAC. Natural England welcomed the Onshore Clarification Notes submitted into examination [AS-025] which considered the Hornsea Project Three cable route which passes about 360m to the east of Booton Common SSSI/Norfolk Valley Fens SAC and Norfolk Boreas cable route and that those construction periods may overlap	The Applicant's position is that in order for Norfolk Boreas to be considered to have the potential to contribute to in-combination effects, there must be sufficient cause to consider that a relevant habitat or species is sensitive to effects due to the project itself (e.g. as a result of particular influence of sensitivity, or the presence of a species in notable numbers on at least one survey occasion, rather than simply being recorded within the site). Therefore, only where the project alone was determined to have the potential for adverse effect upon site integrity on European sites and features have these sites and features been included in the in-combination assessment. If potential for adverse effect upon site integrity was not determined with respect to a site due to Norfolk Boreas alone, there is no prospect of an in-combination effect occurring with another plan or project.
2.5.1	The breeding season apportioning of impacts and breeding season definitions of kittiwakes of the Flamborough and Filey Coast (FFC) SPA and of lesser blackbacked gull (LBBG) of the Alde-Ore Estuary (A-OE) SPA, have also been a key subject of discussions. Assessment of displacement impacts for common scoter of Greater Wash SPA has been a subject of discussions. RTD from Greater Wash SPA and Outer Thames Estuary SPA and mitigation commitments by Vanguard -being relevant for Boreas - were also discussed during examination.	The Applicant has no comment on this.

Section/ Paragraph	Natural's England's Comment	Applicant's Response
	Offshore wind farms and associated figures included in in-combination assessments have also been a key subject of discussions.	
2.6	Applicant's screening and integrity matrices Natural England has provided comment on the updated Habitat Regulations Assessment Screening and Integrity Matrices as submitted by the Applicant at Deadline 6 [REP6-006 and REP6-008] for Deadline 7 [REP7-050] and this is included as Appendix 1 to this document for ease of reference.	The Applicant notes that Natural England's Deadline 7 submission [REP7-050] has been incorporated in the RIES where appropriate, which the Applicant responded to at Deadline 9 (REP9-010).

2.2 Applicant's Response to Natural England's Comments on the RIES Stage 1: Likely Significant Effects (Section 3)

5. Table 2 provides the Applicant's response to Natural England's Comments on Section 3 of the RIES.

Table 2 Applicant's Response to Natural England's Comments on Section 3 of the REIS

Section/ Paragraph	Natural England's Comment	Applicant's Response
Table 3.1	Haisborough Hammond and Winterton (HHW) SAC The Applicant also concluded LSE in-combination effects for NVG Please see our response [REP7-050] in which we raised that the Applicant has greyed out increased suspended sediment and smothering, indicating it to not be an issue for Annex I sandbanks, however within the EIA the Applicant has considered deposition effects from Sandwave levelling etc. so there is an impact pathway and therefore a LSE during construction. As there is a LSE pathway smothering should be considered in the HRA Integrity Matrices.	The Applicant agrees that in-combination effects with Norfolk Vanguard have been screened in and notes this information is provided in the Applicant's HRA Integrity Matrices submitted at Deadline 6 (REP6-007) and the Information to Support HRA report (document 5.3). As discussed in paragraph 75 of the Information to Support HRA report (document 5.3), increased suspended sediment (i.e. turbidity) and smothering would not have a physical impact on the sandbank as the material resuspended would be the same as that currently present and the communities associated with the sandbank are habituated to this sediment type, therefore the Applicant maintains that there would be no Likely Significant Effect (LSE). While the Applicant notes Natural England's disagreement regarding screening out of increased suspended sediment and smothering on Annex I sandbanks, the Applicant welcomes Natural England's position, stated in Section 8 of their comments on the RIES (REP9-057), recognising that there will be no Adverse Effect on Integrity (AEoI) on Annex I Sandbanks resulting from

Section/ Paragraph	Natural England's Comment	Applicant's Response
		increased suspended sediment and smothering: *"For Annex I sandbank features we [Natural England] believe, based on the information provided by the Applicant, that there is unlikely to be an AEoI from smothering and increased suspended as a result of site preparation works and construction activities as the benthic communities have a high tolerance to smothering and increased suspended sediments."*
Table 3.1	Southern North Sea (SNS) SAC Applicant also concluded LSE for in-combination effects for Norfolk Vanguard.	The Applicant agrees and notes this information is provided in the Habitats Regulations Assessment Integrity Matrices submitted at Deadline 6 (REP6-007) and in the Information to Support HRA report (document 5.3).
Table 3.1	The Wash and North Norfolk Coast SAC Please see our response [REP7-050] in which we noted that grey seal have been removed as this is not a designated feature of the site.	Noted and agreed.
Table 3.1	Winterton-Horsey Dunes SAC We note that the site and the consideration of Grey seal were removed from the integrity Matrices as seals are not a designated feature of the site.	Noted and agreed.
Table 3.1	Marine Mammal SACs Applicant also concluded LSE for in-combination effects.	The Applicant agrees and notes this information is provided in the Habitats Regulations Assessment Integrity Matrices submitted at Deadline 6 (REP6-007) and in the Information to Support HRA report (document 5.3).
Table 3.1	Onshore SACs Applicant also concluded LSE for in-combination effects with Norfolk Vanguard.	The Applicant agrees and notes this information is provided in the Habitats Regulations Assessment Integrity Matrices submitted at Deadline 6 (REP6-007) and in the Information to Support HRA report (document 5.3).
3.2.1	HHW SAC Natural England welcomes inclusion of comment on screening in LSE increased suspended sediment and smothering impacts to Annex I Sandbanks.	As discussed above, the Applicant maintains that there would be no LSE as a result of increased suspended sediment and smothering on Annex I Sandbank, however the Applicant welcomes Natural England's position, stated in Section 8 of their comments on the RIES (REP9-057), recognising that there will be no AEoI on Annex I Sandbanks resulting from increased suspended sediment and smothering.
3.5.2	FFC SPA	The Applicant included assessment of the FFC SPA assemblage feature in [REP2-035] and concluded no AEoI for the project

Section/ Paragraph	Natural England's Comment	Applicant's Response
	Natural England advises LSE for the assemblage feature of the FFC SPA due to potential connectivity of the Boreas site with the qualifying features of the site (gannet, kittiwake, guillemot, and razorbill), which are components of the assemblage and due to LSE being a coarse filter.	alone or in-combination, which Natural England has agreed [REP4-040].
Table 3.2	Breydon Water SPA and Ramsar As noted in our response to the Applicant's updated HRA Matrices [REP7-050] species that are not qualifying features of the SPA have been removed. The Ramsar Criterion are Internationally important waterfowl assemblage, Bewick's Swan Cygnus *columbianus bewickii* and Lapwing *Vanellus vanellus*. The list of noteworthy fauna on the JNCC document, have been included as they may meet the threshold criteria, however they have not been publicly consulted on and therefore do not constitute designated features for the purposes of HRA. Therefore they should not be included in Table 3.2.	The Applicant acknowledges Natural England's comment on the species listed for this site. However, the Applicant considered that inclusion of species listed as 'Species/populations identified subsequent to designation for possible future consideration under criterion 6' on the Ramsar Information Sheet for the site (JNCC, 2008) would ensure the assessment was precautionary and future-proofed.
3.9.5	HHW SAC Natural England welcomes the inclusion of impacts of suspended sediment solids to Annex I Sandbanks within the HHW SAC integrity matrix to reflect Natural England's advice.	As discussed above, the Applicant maintains that there would be no LSE as a result of increased suspended sediment and smothering on Annex I Sandbank, however the Applicant welcomes Natural England's position, stated in Section 8 of their comments on the RIES (REP9-057), recognising that there will be no AEoI on Annex I Sandbanks resulting from increased suspended sediment and smothering.

2.3 Applicant's Response to Natural England's Comments on the RIES Stage 2: Adverse Effects on Integrity (Section 4)

6. Table 3 provides the Applicant's response to Natural England's comments on Section 4 of the RIES.

Table 3 Applicant's Response to Natural England's Comments on Section 4 of the REIS - Adverse Effects on Integrity

Section/ Paragraph	Natural England's Comment	Applicant's Response
4.8.6	The increase in draught height committed to by the Applicant for turbines up to and including 14.6MW is from 22m to 35m (and not 25m as stated in the RIES).	The Applicant also identified this point of correction [REP5-059].
4.8.8	We note that in REP6-024, the Applicant's calculated in-combination collision totals for kittiwakes from the FFC SPA had actually increased slightly from previous submission totals (due to the inclusion of the consented estimates for Dogger Bank Creyke Beck A and B in place of those in the project's non-material change application).	The Applicant notes that this made no material difference to the assessment, as agreed with Natural England [REP7-047].
4.8.48	The RIES currently presents the Applicant's position on over precaution and we highlight Natural England's responses in REP4-040, REP4-043, REP5-077 and REP7-046 in response to the Applicant's position. In summary, Natural England notes that our understanding is that in the cumulative and in-combination collision assessments the central predicted value (i.e. those for the mean bird density, mean/central avoidance rate, mean/central flight height) from each individual project assessment is used, rather than the upper figures from any predicted range based on uncertainties in the input data. In any event, for all Round 1 and Round 2 projects the use of a range of figures is simply not possible, because earlier windfarm Environmental Statements did present information to generate ranges of predicted impacts. There are also elements where the assessment may not be precautionary (e.g. the potential limitations in recording of site-specific data on seabird flight heights may have the potential to lead to underestimates of potential collisions and hence assessments may be lacking in precaution in this aspect). Further, for a range of reasons set out in our previous responses the level of uncertainty in the assessments is high, and therefore there is a requirement to be precautionary in our assessment of impacts. Our rebuttal of the	The Applicant has provided detailed submissions on the presence of over precaution in the assessment (in particular with respect to how individual elements of precaution combine to result in an overall highly precautionary assessment) throughout the examination and does not consider any further responses are required here.

Section/ Paragraph	Natural England's Comment	Applicant's Response
	Applicant's position on this matter should be reflected in the RIES, as it has been for individual components.	
4.8.51	Natural England's comments in REP5-077 regarding being aware that updates to the model would make a significant difference to the counterfactual metric outputs of models run using the previous/currently available versions of the tool were made with regard to the EIA scale PVA models and guillemot FFC SPA PVA model undertaken by the Applicant in REP2-035 using the Natural England Seabird PVA tool. They do not refer to the FFC SPA PVAs undertaken during the Hornsea 3 examination or the Alde-Ore Estuary SPA LBBG PVA undertaken during the Norfolk Vanguard examination, as no updates to these models (with the exception of the guillemot FFC SPA model) have been undertaken by the Applicant. Therefore, Natural England's outstanding concerns remain with these models and the advice remains that these are updated now that the Natural England PVA tool updates have been completed. However, we have continued to consider the outputs of these models in our advice at Norfolk Boreas as they represent the best available evidence on which to base an assessment at the present time.	The updates to the NE PVA tool were unfortunately delayed by several weeks and consequently there was insufficient time to undertake the complete range of additional modelling suggested by Natural England for inclusion within the project examination. Nevertheless, the Applicant was able to demonstrate that the outputs obtained from 500 simulations were not materially different from those obtained with 1,000 and 5,000 simulations undertaken using NE's updated PVA tool (as agreed by Natural England, REP9-049). However, the other PVA models to which Natural England refer are versions of the same PVA that have been referenced by Hornsea Project One, Hornsea Project Two, Hornsea Project Three, East Anglia THREE, Norfolk Vanguard and Norfolk Boreas. These outputs are therefore considered to provide robust and reliable predictions for impact assessment and the Applicant assumes it is on this basis that Natural England has used these PVA to date to reach conclusions on potential impacts.
4.8.54	Natural England have advised that the density independent PVA model outputs are the most appropriate to use for the colonies and species concerned for the Norfolk Boreas assessment, as for these colonies there is no clear evidence to support the application of any particular form or magnitude of density dependence.	The Applicant notes Natural England's position on density dependence and reiterates that the impact assessment conclusions are based on density independent model outputs as advised by Natural England. However, the Applicant considers the use of density independent PVA to be a key component of the over-precaution in Natural England's approach to impact assessment. For all the species under consideration for Norfolk Boreas, the conclusions obtained from density independent models will always indicate greater magnitudes of impact than those obtained from density dependent models. This is important to note, since both Natural England and the RSPB advocate the use of density independent PVA, while acknowledging the fact that real populations are subject to density dependent regulation, albeit the strength and mechanism is poorly known. Thus both organisations are

Section/ Paragraph	Natural England's Comment	Applicant's Response
		effectively acknowledging that the PVA results they consider are inherently precautionary and therefore the actual magnitude of impact will be less than that on which they base their conclusions.
4.9 9	Benthic Ecology - Haisborough, Hammond and Winterton SAC Natural England has provided detailed advice on the updated SIP and CSIMP [NE.NB.D9.03.SIP] and also provided a Position Statement [NE.NB.D9.09.PS] at Deadline 9.	The Applicant's responses to Natural England's advice on the updated SIP and CSIMP [REP9-039] and Position Statement [REP9-045] are provided in Sections 1.9 and 1.10 (respectively) of the Applicant's Comments on Deadline 9 Submissions (document reference ExA.ASR.D10.V1).

2.4 Applicant's Response to Natural England's Comments on the RIES Alternatives, Compensation and IROPI (Section 5)

7. Table 4 provides the Applicant's response to Natural England's comments on Section 5 of the RIES.

Table 4 Applicant's Response to Natural England's Comments on Section 5 of the REIS - Alternatives, compensation and IROPI

Section/ Paragraph	Natural England's Comment	Applicant's Response
5.1.12	Natural England has provided advice to the SoS in relation to Hornsea Project 3 (Appendix 2) and Norfolk Vanguard OWF (Appendix 3), and subsequently has provided advice into the Norfolk Boreas examination Deadline 9 in response to: • Position statement on derogation [REP6-025] • In Principle Habitats Regulations Derogation case [REP7-024 to REP7-028] Natural England's position to Alternatives and Compensation as presented within our Summary Position is included in the text below.	The Applicant welcomes the sharing of information from other projects however considers that all key points of relevance have been reflected in Natural England's submissions regarding Norfolk Boreas. The Applicant's response to Natural England's comments on the Norfolk Boreas Position statement on derogation [REP9-041] is provided in section 1.11 of the Applicant's Comments on Deadline 9 Submissions (document reference ExA.ASR.D10.V1). The Applicant's responses to Natural England's comments on the Norfolk Boreas In Principle Habitats Regulations Derogation case, Appendices 1 to 3 are provided in sections 1.16 to 1.18 of the Applicant's Comments on Deadline 9 Submissions (document reference ExA.ASR.D10.V1).
Alternatives HHW SAC	A commitment to surface-laid cables and the use of marker buoys would remove the need for cable protection altogether. This has been achieved for the Lincs Offshore Wind Farm in The Wash and North Norfolk Coast SAC and is currently also being employed by The Wash Harbour Masters to protect the Race Bank offshore	Whilst the Applicant cannot comment on the alternatives available to other offshore wind farms, Section 4.6.5.4.1 of the Norfolk Boreas In Principle Habitats Regulations Derogation Provision of Evidence (REP7-024), explains that the use of marker buoys as an alternative to surface protection at locations where it is

Section/ Paragraph	Natural England's Comment	Applicant's Response
	windfarm cables. We continue to advise that this alternative should be considered.	not possible to achieve the target depth of cable burial, is not feasible for Norfolk Boreas for the following reasons: • The assessment of risk to the cables (as carried out by insurers and offshore transmission owner (OFTO) technical advisers) is based on the degree of physical protection afforded by the completed installation design and unprotected cables are likely to present an unacceptable level of risk. • Whilst marker buoys may be effective in reducing the threat of physical damage to cables associated with bottom-trawling activities, they cannot be considered as an equivalent alternative to physical protection measures. • Marker buoys do not mitigate other types of threat to the cable e.g. anchor dragging in poor weather. • Allowing exposed cables to be present on the seabed, even if marked with buoys would represent a potential health and safety risk (e.g. as a snagging hazard). • Deployment of marker buoys would require careful consideration with regards to navigation safety once the location(s) of marker buoys are known; and • Marker buoys could become detached leaving the exposed cables unmarked.
HHW SAC	Natural England agrees that an extension to the HHW SAC site boundary would be the most environmentally beneficial measure to deliver compensation for both Annex 1 Sandbanks and Reefs habitat and ensure coherence of the Natura 2000 network. Whilst Natural England consider, on ecological grounds, that this measure has the potential to compensate for Annex 1 Sandbanks and Reefs habitat in HHW SAC, more detail is required regarding how this would be delivered. We acknowledge there are likely to be practical challenges and potential policy issues in securing this compensation measure as well as any required additional site management measures. Therefore consultation with Defra, other regulators (such as MMO and Eastern Inshore Fisheries and Conservation Authority) and key stakeholders is required.	The Applicant welcomes Natural England's agreement that an extension to the HHW SAC site boundary would be the most environmentally beneficial compensatory measure. The Applicant notes that the details of the compensatory measures would be subject to the conclusions of the Appropriate Assessment and would therefore be developed post consent, if required, as secured in Schedule 19, Part 3 of the draft DCO. Schedule 19, Part 3 requires consultation with the MMO and the relevant statutory nature conservation body. Should wider consultation be deemed appropriate, this will be undertaken during this post consent consultation to inform the detailed design of compensatory measures.

Section/ Paragraph	Natural England's Comment	Applicant's Response
FFC SPA Kittiwake	Given that the key issue for Kittiwake at FFC SPA, based on our understanding of site condition, is decreased productivity, Natural England are keen that measures focussing on increasing productivity, such as prey availability, are taken forward. However, Norfolk Boreas has decided that construction of artificial nests in the southern North sea / south-east England, but located outside of the Flamborough and Filey Coast kittiwake population would provide the most confidence in deliverability. Though this isn't Natural England's preferred option, we agree that in-principle, the provision of additional nest sites for kittiwakes in the southern North Sea/southeast of England might have the potential to be of benefit to the regional kittiwake population and hence in our view, would ensure coherence of the Natura 2000 network (N2K), particularly if considered as a phased approach that also includes more medium term measures on prey availability. Whilst this measure would not directly benefit the FFC SPA population, we do recognise that it could be considered as a measure to ensure the coherence of the N2K network for kittiwake. We do advise however, that greater confidence is needed: a. That there would be a net benefit to the overall kittiwake population size (not just simply causing a redistribution); and b. That there are sufficient food resources within likely foraging range around any new location to support the required level of productivity. Whilst Natural England consider this measure has the potential to compensate for kittiwake at FFC SPA, more detail is required regarding the size and productivity of any new colony, the location and type of any new structure, the size of new structure, how the project intends to quantify the success of the measure, and the distance of the measure from the FFC SPA population. It should also be noted that depending on the chosen location there may also be an increased collision risk that would need to	The Applicant welcomes Natural England's comments on the proposed compensation options. The Applicant agrees that fisheries management has the potential to deliver greater compensation, however such management is not within the Applicant's power since it requires government intervention (as noted by Natural England in paragraph 4.11 of REP9-047). In contrast the proposal to provide additional nesting habitat represents a measure which the Applicant can have high confidence in being able to deliver. The Applicant agrees that detailed planning and further consultation with Natural England would be undertaken post consent if these measures are required by the Secretary of State (as secured in the dDCO by the requirement for submission of a detailed scheme for the Secretary of State's approval). This would include consideration and analysis to help inform the appropriate scale of compensation required (i.e. the size of artificial colony) and a review of fishery data to understand the prey resource to assist in site selection as well as options for monitoring in order to ensure the measures delivered the required levels of compensation required, including allowance for any over-compensation deemed necessary by the Secretary of State.

Section/ Paragraph	Natural England's Comment	Applicant's Response
	be taken account of when determining the productivity of any new colony.	
Alde-Ore Estuary SPA Lesser black-backed gull	Given that the key issue for lesser black-backed gull at Alde-Ore Estuary SPA, based on our understanding of site condition, is decreased productivity, Natural England are keen that measures focussing on increasing productivity, such as predator control, are taken forward. Ultimately the project has decided that funding a coordinator, whose role would be to facilitate the organisation of a stakeholder working group tasked with overseeing a review of the population's health, factors which have contributed to the decline, and proposals for conservation measures, would be the their preferred compensation option. Depending on the outcome of this review, a trial may be undertaken to test options, before a final measure (or suite of measures) is taken forward for implementation, which could include predator control at nesting sites. Natural England's view is that whilst the funding of a project coordinator and scoping study is helpful, there must be a commitment to delivering measures on the ground that would offset the predicted collision risk mortality. Site management measures should be already happening within the designated site. The Section 106 agreement which was secured to address the impacts from the Galloper offshore windfarm to the LBBG population by facilitating changes to site management measures for the benefit of LBBG is still in the scoping phase of options which is effectively undertaking the same role as the Applicant's scoping study. Therefore, for Norfolk Boreas' proposals to demonstrate that they would have any added benefit beyond the S106 agreement, the outcomes of the S106 need to be determined first. Any compensation measure proposed by the Applicant would also need to be kept separate to the S106 to clearly demonstrate deliverables from the two projects. Therefore, whilst we recognise the benefit of the Applicant's proposal in helping to identify possible compensation measures; we do not feel it will achieve the desired outcomes without further specification of how Norfolk Boreas will	The Applicant welcomes Natural England's comments on the proposed compensation. The Applicant agrees that improving lesser black-backed gull productivity, likely through reduced predation, would be the most effective compensation. However, following discussions with a range of relevant stakeholders the Applicant became aware that there were different opinions on what the best options would be. Consequently, the Applicant considered that the best approach would be to provide funding for a facilitator tasked with seeking a consensus on the most appropriate compensation options. However, it is important to note that funding of this post is not an alternative to funding for the measures thus identified, but in addition to this (although noting that this would also need to take into account the project's contribution to the total predicted impact). The Applicant also notes that, as far as the Applicant is able to determine, the Galloper S106 agreement has thus far failed to deliver any measures for this population, and this was part of the determination that a facilitating role would be an important step. The Applicant also agrees that detailed planning and further consultation with Natural England would be undertaken post consent if these measures are required by the Secretary of State (as secured in the dDCO by the requirement to submit a detailed scheme for the Secretary of State's approval).

Section/ Paragraph	Natural England's Comment	Applicant's Response
	compensate for reduced productivity of the LBBG population as a result of their project. Natural England agrees with the Applicant that mammalian predator control is the most suitable compensation measure and we believe that this could be achieved through partnership working with local land owners in the wider Alde-Ore. Therefore we feel that further detail on this measure needs to be clarified and conformation that delivery of the measure can be assured.	

2.5 Applicant's Response to Natural England's Comments on Annex 1 of the RIES

8. Table 5 provides the Applicant's response to Natural England's comments on Annex 1 of the RIES.

Table 5 Applicant's Response to Natural England comments on Annex 1 of the REIS - Screening

Section/ Paragraph	Natural England's Comment	Applicant's Response
N/A	Natural England has provided comment on the updated Habitat Regulations Assessment Screening and Integrity Matrices as submitted by the Applicant at Deadline 6 [REP6-006 and REP6-008] for Deadline 7 [REP7-050] and this is included as Appendices to this document for ease of reference.	The Applicant notes that Natural England's Deadline 7 submission [REP7-050] has been incorporated in the RIES where appropriate which the Applicant responded to at Deadline 9 (REP9-010).

2.6 Applicant's Response to Natural England's Comments on Annex 2 of the RIES – Summary of Positions in relation to AEoI

9. Table 6 provides the Applicant's response to Natural England's comments on Annex 2 of the RIES.

Table 6 Applicant's Response to Natural England's Comments on Annex 2 of the RIES – Summary of Positions in relation to AEoI

European site	Feature	Natural England's Comment	Applicant's Response
Flamborough & Filey Coast (FFC) SPA	Gannet (breeding); Kittiwake (breeding); Guillemot (breeding); Razorbill (breeding); and	This table should make clear that Natural England agree AEoI can be ruled out for FFC SPA for: gannet in-combination (collision, displacement, collision plus displacement); guillemot and razorbill in-combination displacement; seabird assemblage in-combination (collision and displacement) when H3 and H4 are excluded (REP4-040 and REP7-050).	The Applicant welcomes Natural England's clarifications on gannet, guillemot and razorbill. However, the Applicant also notes that since Deadline 7 [REP7-047/048] Natural England has altered its position on the potential in-combination effect on kittiwake from Flamborough and Filey Coast SPA. In submissions for Norfolk Boreas and all relevant wind farm

European site	Feature	Natural England's Comment	Applicant's Response
	Seabird assemblage	Due to Natural England's uncertainty regarding the appropriate estimates to use for Hornsea Project Three and Hornsea Project Four) Natural England consider there to be an AEoI to FFC SPA kittiwakes irrespective of whether Hornsea Project Three and Hornsea Project Four are included or excluded. Further to this, Natural England has highlighted that the in-combination total of collision mortality had already exceeded levels which were considered to be of an AEoI to kittiwake at FFC SPA, and that any additional mortality arising from these proposals would therefore be considered adverse.'	applications since East Anglia THREE, the Applicant's review of Natural England submissions has found that Natural England's position was that an adverse effect on integrity (AEoI) 'could not be ruled out'. This was also Natural England's position on submissions for Norfolk Boreas up until Deadline 7 [REP7-047/048], the most recent ornithology updates from Natural England before Deadline 9. However, it appears that Natural England has now altered its position to state that there 'will be an AEoI' due to in-combination collision risk of kittiwake from the SPA. The Applicant considers that this position implies Natural England now has greater certainty in the magnitude of in-combination impact. However the Applicant is not aware of any new evidence which would explain this revised position, and has requested clarification from Natural England to help understand the basis for this change in position.
Alde-Ore Estuary SPA and Ramsar	LBBG (breeding)	Natural England have advised [Deadline 9] that it could not be certain that there will be no AEoI of Alde-Ore Estuary SPA through impacts to lesser black-backed gull, in-combination with other plans and/or projects.	The Applicant maintains that AEoI can be ruled out for the reasons provided in [REP2-035] and further supported following additional mitigation for the project alone [REP5-059] and updated in-combination totals [REP6-024 and REP7-029].
Haisborough Hammond Winterton SAC	Sandbanks	Sandbanks: Introduction of new substrate Natural England welcomes the opportunity to confirm its position. Natural England has concluded that an AEoI on the Sandbank feature of HHW SAC due to the introduction of cable protection cannot be excluded beyond all reasonable scientific doubt. Please see our Deadline 9 submissions and Annex 3 below for further detail. Natural England does not agree with the Applicant's conclusions that the mitigation secured in the SIP or CSIMP will rule AEoI integrity to the Annex I Sandbank Feature of HHW	The Applicant maintains that an AEoI can be ruled out for all features of the HHW SAC. The Applicant has followed Natural England's advice note regarding consideration of small scale habitat loss within SACs in relation to cable protection [REP1-057] which states that Natural England would consider there to be no likelihood of an AEoI where any one (or more) of the following can be demonstrated: • That the loss is not on the priority habitat/feature/sub feature/supporting habitat, and/or

European site	Feature	Natural England's Comment	Applicant's Response
		SAC. It is for the Secretary of State to determine, on the basis of an Appropriate Assessment, whether the information provided by the Applicant actually supports the conclusion of no AEoI to HHW SAC. In making this judgement the decision maker will need to take account of the uncertainties identified by Natural England in our Deadline 9 responses.	• That the loss is temporary and reversible, and/or • That the scale of loss is so small as to be de minimis and/or • That the scale of loss is inconsequential including other impacts on the site/feature/sub feature. Through the various mitigation commitments made by the Applicant (including decommissioning cable protection to ensure the loss would be temporary, reducing the quantity of cable protection and avoiding priority areas to be managed as reef) the Applicant considers that all of the above are demonstrably met in the case of Norfolk Boreas. Further information is provided in the Applicant's comments on deadline 9 submissions [ExA.ASR.D10.V1].
Haisborough Hammond Winterton SAC	Sandbanks	Sandbanks: Smothering and increased suspended sediment Natural England welcomes the opportunity to confirm its position. For Annex I sandbank features we believe, based on the information provided by the Applicant, that there is unlikely to be an AEoI from smothering and increased suspended sediment as a result of site preparation works and construction activities as the benthic communities have a high tolerance to smothering and increased suspended sediments.	The Applicant welcomes Natural England's agreement that there will be no AEoI from smothering and increased suspended sediment on Annex 1 Sandbanks in the HHW SAC.
Haisborough Hammond Winterton SAC	Reef	Reef- Introduction of new substrate Natural England welcomes the opportunity to confirm its position. Natural England considers that an AEoI on the Annex I feature Reef within the HHW SAC cannot be excluded beyond all reasonable scientific doubt due to the introduction of cable protection (and/or cable installation activities) However, if at the time of installation micro siting is possible, reef features are fully avoided and	The Applicant maintains its position that an AEoI can be ruled out for the worst case scenarios assessed due to the small scale of any cable protection deployment, which is in accordance with Natural England's advice note regarding consideration of small scale habitat loss within SACs in relation to cable protection [REP1-057]. The advice note states that Natural England would consider there to be no likelihood of an AEoI where any one (or more)

European site	Feature	Natural England's Comment	Applicant's Response
		no cable protection is used within fisheries management areas for the recovery of reef, then it may be possible to exclude an AEoI to this feature. Please see our Deadline 9 submissions and Annex 3 below for further detail.	of the following can be demonstrated: • That the loss is not on the priority habitat/feature/sub feature/supporting habitat, and/or • That the loss is temporary and reversible, and/or • That the scale of loss is so small as to be de minimis and/or • That the scale of loss is inconsequential including other impacts on the site/feature/sub feature. Through the various mitigation commitments made by the Applicant (including decommissioning cable protection to ensure the loss would be temporary, reducing the quantity of cable protection and avoiding priority areas to be managed as reef) the Applicant considers that all of the above are demonstrably met in the case of Norfolk Boreas. Further to the Applicant's conservative assessment of the worst case scenario, the Applicant notes that its preference at the time of installation will be to micro site if possible ensuring reef features are fully avoided. The Applicant note Natural England's comment that if all mitigation measures are implemented then it may be possible to exclude AEoI. The Applicant welcomes Natural England's recognition of this. As explained in the Applicant's Comments on Deadline 9 Submissions and Other Submissions [ExA.ASR.D10.V] row 5 of section 1.10 and row 10 of 1.9 there can be confidence in the delivery of these measures such that they can be relied on to reach a conclusion of no AEoI. The new agreed Condition 3(1)(g)(7) (see row 5 of section 1.9 that document) provides further

European site	Feature	Natural England's Comment	Applicant's Response
			confidence that the decommissioning mitigation measure would be fully delivered. The Applicant also notes that, as presented in the Integrity matrices, the introduction of new substrate should be assessed as a separate effect to that of habitat loss as new substrate has the potential to cause a number of effects such as supporting species and benthic communities that would otherwise have not been able to establish in that location) and hence it is included with the Information to Support HRA report. The Applicant also considers both habitat loss and introduction of new substrate caused by the placement of cable protection as an operational impact as it would extend over the operational period of the project and would not be limited to construction or decommissioning.
Haisborough Hammond Winterton SAC	Reef	Reef- Smothering and increased suspended sediment Natural England welcomes the opportunity to confirm its position. As set out in the Applicants Additional Mitigation Measures Documents and 8.20 SIP and CSIMP control documents there is the intention to avoid Annex I reef features by a distance of 50m and subsequently avoid smothering effects from depositing Sandwave clearance sediment. However, there remains an outstanding concern that the sediment removed during sandwave levelling should be placed in areas of similar grain size (Please see 95% similar grain size condition for Norfolk Vanguard) so that the Sandbank or Reef habitats are not significantly changed. Please see our Deadline 9 submissions and Annex 3 below for further detail.	Please see the SoCG between the Applicant and Natural England submitted at Deadline 10 [ExA.SoCG-17.D10.V4] for the latest position by both parties with regards to Natural England's outstanding concern that the sediment temporarily removed during sandwave levelling should be placed in areas of similar grain size. All parties agree that it is for the SoS to determine whether a condition is required.

2.7 Applicant's Response to Natural England's Comments on Annex 3 of the RIES – Integrity matrices

10. Table 7 provides the Applicant's response to Natural England's comments on Annex 3 of the RIES.

Table 7 Applicant's Response to Natural England comments on Integrity Matrices

Section/Paragraph	Natural England's Comments	Applicant's Response
P. 72 AOE SPA LBBG	Regarding (b), as set out in our Norfolk Boreas Deadline 6 and 7 responses, REP6-049 and REP7-048, to the Applicant's positions on headroom in REP4-014 and REP6-021, Natural England advises that reductions in predicted impacts resulting from 'as-built wind farm designs' should not be given weight in an Appropriate Assessment, unless the reduction of the Rochdale Envelope has been legally secured and that updated CRM is carried out using the final turbine parameters and overall project design. To date, there is only one English OWF where these two criteria have been met: East Anglia One. Natural England considers that an AA that rests its in-combination conclusions on 'as-built' impact reductions for which are not legally secured could leave any associated consent decisions open to challenge.	The Applicant considers that the difference between consented and as-built collision predictions is an important source of over-precaution in the in-combination impact assessment and that total collision risks for most species would be around one third lower if this was taken into account [REP6-021] and therefore this should be an important consideration in the decision making process, albeit the Applicant is not reliant upon it to reach a conclusion of no adverse effect on integrity.
P. 75 FFC SPA kittiwake	Regarding (b), as set out in our Norfolk Boreas Deadline 6 and 7 responses, REP6-049 and REP7-048, to the Applicant's positions on headroom in REP4-014 and REP6-021, Natural England advises that reductions in predicted impacts resulting from 'as-built wind farm designs' should not be given weight in an Appropriate Assessment, unless the reduction of the Rochdale Envelope has been legally secured and that updated CRM is carried out using the final turbine parameters and overall project design. To date, there is only one English OWF where these two criteria have been met: East Anglia One. Natural England considers that an AA that rests its in-combination conclusions on 'as-built' impact reductions which are not legally secured could leave any associated consent decisions open to challenge.	The Applicant considers that the difference between consented and as-built collision predictions is an important source of over-precaution in the in-combination impact assessment and that total collision risks for most species would be around one third lower if this was taken into account [REP6-021] and therefore this should be an important consideration in the decision making process, albeit the Applicant is not reliant upon it to reach a conclusion of no adverse effect on integrity.
P. 77 FFC SPA gannet	Regarding (b), Natural England notes that we have agreed that an AEoI can be ruled out for in-combination collision risk when	The Applicant welcomes this comment from Natural England.

Section/Paragraph	Natural England's Comments	Applicant's Response
	Hornsea 3 and 4 are excluded. This is based on: • After 30 years the colony would still be predicted to be above the conservation objective population size of 8,469 pairs or 16,938 individuals with a growth rate of 1% per annum, and that the colony is predicted to still grow above the current mean population of 24,594 adults under any growth rate scenario from 2% to 5% per annum; and, • We considered it to be highly unlikely that the FFC gannet colony annual growth rate would be as low as 1%, and from the analysis of gannet colony growth rates we conducted the current annual growth rate of c 11% appears to be relatively high for a colony of this age and so the colony is likely to do better than a 1.3 % annual growth rate in the foreseeable future [REP4-040]. This was also the case for in-combination collision plus displacement (part h).	
P. 85 General	There is no table 3 is something missing?	N/A
P. 86 HHW SAC Sandbanks	Temporary physical disturbance during construction a) Paragraph states: The Applicant's HRA Report [section 7.3.1.5 of APP-201] confirmed that all seabed material arising from the HHW SAC during cable installation would be placed back into the SAC to ensure the sediment is available to replenish the sandbank features. It confirmed [REP4-014] that final sediment disposal strategy would be agreed with the MMO in consultation with Natural England and included within the final HHW SIP. The MMO [REP4-034] and Natural England[REP4-043] agreed this approach was appropriate Natural England is content that the Applicant has demonstrated that there are suitable disposal locations for sandwave levelling operations, which would both retain the sediment within the Sandbank system to allow for its recovery and avoid impacts to the Annex 1 Reef feature. However, changes to sediment composition at the disposal locations has not been resolved (i.e. the 95% similar sediment grain size condition).	The Applicant welcomes Natural England's agreement that it is appropriate for the final sediment disposal strategy to be agreed with the MMO in consultation with Natural England through the final HHW Control Document. The Applicant also welcomes Natural England's recognition that there are suitable disposal locations which would retain the sediment within the Sandbank system and avoid impacts to Annex 1 Reef. The SoCG between the Applicant and Natural England submitted at Deadline 10 [ExA.SoCG-17.D10.V4] provides the latest position of both parties with regards to Natural England's outstanding concern regarding changes to sediment composition at disposal locations. All parties agree that it is for the SoS to determine whether a condition is required. In response to Natural England's concerns regarding the use of the Site Integrity Plan (SIP) as a mechanism to address AEoI, the Applicant submitted an alternative to the SIP at Deadline 6, in the form of the Norfolk Boreas HHW Special Area of Conservation Outline Cable

Section/Paragraph	Natural England's Comments	Applicant's Response
	Natural England would like to take this opportunity to clarify that we have agreed that the use of a downfall pipe and the placement of sediment within the SAC is appropriate; however we still fundamentally disagree with the SIP as a mechanism to address AEoI issues at the time of construction. Although sandwave levelling has been proposed as a means of reducing the potential requirement for cable protection, Natural England highlights that there is insufficient evidence to demonstrate that full recovery of the Sandbank system is achievable and within the affected Annex I Sandbank systems. This is because there is insufficient certainty that there will not be a need for cable protection over the lifetime of the project. Therefore Natural England cannot currently rule out an AEoI beyond all reasonable scientific doubt to HHW SAC Sandbanks from sandwave levelling and temporary physical disturbance during construction.	Specification, Installation and Monitoring Plan [REP6-017]. As explained in the HHW position paper [REP5-057] this secures the same mitigation as provided in the SIP, however removes the requirement for the MMO to be satisfied, during the post consent stage, that there would be no AEoI on the HHW SAC, recognising that this is the key area of concern for Natural England and the MMO. With regards to Natural England's concerns that there is insufficient certainty that there will be no requirement for cable protection over the lifetime of the project, the Applicant notes that there is certainty that cable protection cannot be deployed during the O&M phase of the project without securing an additional marine licence. The Applicant maintains that an AEoI can be ruled out for all features of the HHW SAC as discussed in detail in the Applicants HHW SAC position paper [REP5-057] submitted at Deadline 5.
P.90 HHW SAC Reefs	b) Temporary physical disturbance during construction – reefs Natural England has provided further advice in response to the updated SIP and CSIMP at Deadline 9 [NE.NB.D9.03.SIP] Natural England cannot be certain that the avoidance of Annex I Reef habitats through micro-siting the cable is achievable and therefore that it wouldn't hinder the management measures put in place to restore Annex I Reef from fisheries pressures, particularly if cable protection was needed. In addition Natural England maintains that there are uncertainties in relation to the recoverability of Annex I reef from cable installation activities.	The Applicant's response to Natural England's advice on the updated SIP and CSIMP [REP9-039] is provided in Section 1.9 of the Applicant's Comments on Deadline 9 Submissions (document reference ExA.ASR.D10.V1) and further detail on the Applicant's position on micositing is provided in section 2.1 of the Applicant's HHW SAC position paper [REP5-057] submitted at Deadline 5. Further information regarding evidence of recovery is summarised below.
P. 91 HHW SAC Sandbanks and Reef	c) Temporary physical disturbance during operation – sandbanks and reef Natural England [RR-099] noted that sandwave levelling does not ensure that cables remain buried. The Applicant [AS-024] explained that the worst case scenario for the O&M phase is based upon the potential for suboptimal burial in the absence of sandwave levelling. In relation to the above statement Natural England notes that within the Control Document (8.20) the Applicant	<u>Sandbanks</u> The Applicant agrees that the worst case scenario assessed reflects potential reburial requirements should sandwave levelling not be used during installation. The cable installation method and associated opportunities to minimise potential for reburial must be agreed with the MMO in consultation with Natural England in accordance with the HHW control documents (DCO document

Section/Paragraph	Natural England's Comments	Applicant's Response

	has committed to following the reburial hierarchy if suboptimal cable burial is achieved or should repairs be required during the operational phase, which is welcomed by Natural England. In addition should further cable protection be required during the operation phase then this will subject to a further marine licence.
	
	Therefore, any Annex I sandbank recovery since construction is likely to be slowed in areas where there is repeated O&M impacts. However, please note the uncertainties Natural England has raised during examination in relation to the limited evidence of full recovery and potential site specific difference in recoverability.
	
	If the mitigation measures have achieved the desired outcome of avoiding impacts to Annex I reef at the time of construction, then any reef that has subsequently developed over the export cables during the operational phase has a high probability of recovery. However, there remains uncertainty in relation to the recoverability of established reefs if impacted at the time of construction, similarly those uncertainties remain for further O&M in those areas during the life time of the project until recovery of Reef can be proven (potentially though the afore mentioned O&M impacts to reef that has established over the cable route since construction). Natural England therefore cannot say beyond reasonable scientific doubt no AEoI to HHW SAC Sandbanks or Reefs alone and in-combination.
		8.20). In the unlikely event that short term temporary disturbance is required during O&M, the worst case scenario areas could be as follows, after which recovery is likely to commence:
		
		• Repairs
		  ○ up to 0.0003km^2 per cable repair, with an estimate of one repair per cable every 10 years in the HHW SAC. This represents 0.00002% of the 1,468km^2 SAC area and 0.00005% of the 669km^2 Annex I Sandbank area within the SAC) every 10 years.
		• Reburial
		  ○ The total worst case scenario, should pre-sweeping not be undertaken, is an area of 0.4km^2 requiring reburial over the project life. This represents 0.03% of the 1,468km^2 SAC area and 0.06% of the 669km^2 Annex I Sandbank area within the SAC), however it should be noted that this would be in small sections and so would not all be disturbed throughout the life of the project.
		  ○ If reburial is required it is likely that this would be in relatively short sections (e.g. 1km) at any one time, providing a disturbance of approximately 0.01km^2 at any one time (based on a disturbance width of approximately 10m). This represents 0.0007% of the 1,468km^2 SAC area and 0.0015% of the area of sandbanks within the SAC.
		
		Appendix 7.1 of the Information to Support HRA report (document reference 5.3.7.1) provides a study by experts ABPmer which concludes that recovery from cable installation is likely to occur within a year. Recovery from repairs and/or reburial during O&M can be

Section/Paragraph	Natural England's Comments	Applicant's Response
		expected to be within similar timeframes. The small scale and short term potential disturbance during O&M will not affect the form and function of the large scale sandbank system or the associated communities which are habituated to disturbance as a result of the mobile nature of the sandbanks, therefore there will be no AEoI. <u>Reef</u> There is sufficient evidence from the aggregates dredging industry to indicate that impacted Annex 1 reef can rapidly recover from cable installation. Studies have shown that established *S. spinulosa* reef rapidly recovers after dredging operations (Pearce *et al* 2007). As discussed in the Information to Support HRA report (document 5.3) evidence suggests that recovery of thin encrusting reefs may commence rapidly, as demonstrated by surveys on the North Yorkshire coast whereby areas of *S. spinulosa* reef that had been lost due to storms had recolonised up to the maximum thickness (2 - 3cm) during the following summer (Holt, 1998). Studies within the Hastings Single Bank aggregate extraction area also found there to be rapid recolonisation of reefs (Pearce et al., 2007) On the basis of the example evidence presented here and further details in the Information to Support HRA Report (document 5.3), the Applicant maintains that any Annex I *S. spinulosa* reef disturbed during construction or O&M can be expected to recover and therefore Norfolk Boreas would not hinder the conservation objectives of the HHW SAC, therefore an AEoI can be ruled out.
P. 85 HHW SAC Sandbank and Reef	Habitat loss d) Cable protection In Natural England's view, even with the proposed reduction in the number of export cables from six to two by using a High Voltage Directional Current (HVDC), reduced amount of cable protection from 10% -5% and avoidance of reef in priority areas the remaining proposed levels of cable protection would constitute a lasting and potentially irreversible impact on both designated site features, thereby	The Applicant suggests that Natural England's position regarding potential lasting impacts on Annex I Reef and Sandbank as a result of cable protection (with a maximum area of 0.028km^2) following decommissioning of Norfolk Boreas is disproportionate and inconsistent when Natural England expects extensive recovery of *S. spinulosa* reef following extensive and repeated commercial fisheries dredging, should

Section/Paragraph	Natural England's Comments	Applicant's Response
	hindering the conservation objectives of the site. Annex I Sandbanks and Reefs features within the site, which are both in unfavourable condition. Consequently Natural England cannot be certain that cable protection will not adversely affect the integrity of the HHW SAC site Whilst Natural England can agree that decommissioning cable protection would change the impact from permanent to temporary if concrete mattress (or similar type product) are used there is still a further consideration of significant temporal impacts from a lasting impact for >30 years. There is no empirical evidence presented of what the impacts are likely to be on Annex I habitats and the sites conversation objectives from such a temporally long time and whether habitat recovery is achievable to its pre-impacted state. Therefore, we advise due to the uncertainties, that the proposed mitigation measure would not rule out AEoI to HHW SAC Annex I feature Sandbanks or Reef beyond all reasonable scientific doubt.	fisheries closure areas be adopted in the HHW SAC. The Applicant has provided an assessment, reflecting various additional mitigation measures, including decommissioning of cable protection, in the Additional information for the HHW SAC position paper, Annex 2 Assessment of Additional Mitigation in the HHW SAC (Version 2) submitted at Deadline 6 (REP6-019). This assessment reflects the long-term temporary nature of the habitat loss and given the small scale and likely recovery (as summarised above), the Applicant is confident that an AEoI can be ruled out. (Note this assessment has been updated for Deadline 10 [to reflect the recent commitment by the applicant to reduce the number of cable crossings [ExA.AS-1.D10.V3]. The Applicant would also refer to the fact that Natural England have requested that the Applicant commit to concrete mattress (or a similar product) within the DCO (see the Applicant's Comments on Deadline 9 Submissions and Other Submissions [ExA.ASR.D10.V1]). The Applicant believes this is, at least partly due to a desire to restrict the height of cable protection to ~ 50cm in order to *have the benefit of enabling natural processes to occur.* (see Natural England's REP9-044). As described in ExA.ASR.D10.V1, the Applicant consider that cable protection has been limited to 50cm as stated in Chapter 5 of the ES [APP-218] as used throughout the assessment. Natural England do not appear to have taken this into consideration when forming their opinion of possible impacts to Annex I Sandbanks. Following further consultation with Natural England the commitment has been made within the DCO (Condition 3(1)(g) of the Transmission DMLs (Schedule 11 and 12of the DCO) to not employ rock or gravel dumping within the HHW SAC. This is to ensure that the type of cable protection chosen is suitable for decommissioning
P.93 HHW SAC Sandbanks	e. Permanent habitat loss during operation – sandbanks	The Applicant's Additional information for the HHW SAC position paper, Annex 2 Assessment of Additional Mitigation in

Section/Paragraph	Natural England's Comments	Applicant's Response
	Whilst Natural England recognises that the placement of any cable protection within Annex I sandbanks is likely to be a persistent i.e. sometimes exposed/buried. The WCS must be assessed which is that the cable protection is exposed and there is a change to Annex I habitat therefore hindering the conservation objectives of the site for the life time of the project and beyond as recovery will not be immediate or guaranteed. As this impact is lasting/long term and site recovery wouldn't be assured, Natural England's view is that reasonable scientific doubt remains regarding the impact of the proposals on the conservation objectives for the site. Accordingly a precautionary approach is required. If it is considered that certain types of cable protection could be modified to enable a greater success of recovery/removal at decommissioning, whilst reducing wider designated site impact, then we advise that this would need to be reflected in the DCO/DML to ensure this mitigation is secured.	the HHW SAC (Version 2) submitted at Deadline 6 (REP6-019), provides a worst case scenario of habitat loss over the project life (rather than Natural England's recognition that this will only be persistent, i.e. sometimes buried). The total habitat loss within the HHW SAC associated with Norfolk Boreas could be up to 0.028km^2. This represents 0.0019% of the 1,468km^2 SAC area and 0.004% of the 678km^2 area of sandbanks within the SAC. This scale of habitat loss is comparable with (or less than) the scale of Annex I habitat loss on a number of other European sites for which AEoI was ruled out and development consent granted, as summarised in Natural England (2016) and outlined in the Applicants response to Natural England's comment on P. 98 (HHW SAC Reef) below. The Applicant is therefore confident that an AEoI can be ruled out. The commitment to agree the type of cable protection and ensure that cable protection will be decommissioned is secured through the HHW SAC control documents (DCO document 8.20), which state: • "*Prior to installation, the location, extent, type and quantity of any cable protection must be agreed with the MMO in consultation with Natural England";* and • *"Norfolk Boreas Limited has made a further commitment to decommission cable protection at the end of the Norfolk Boreas project life where it is associated with unburied cables due to ground conditions"* • *"Following further consultation with Natural England the commitment has been made within the DCO (Condition 3(1)(g) of the Transmission DMLs (Schedule 11 and 12of the DCO) to not employ rock or gravel dumping within the HHW SAC. This is to ensure that the type of cable protection chosen is suitable for decommissioning"*
P. 94 HHW SAC Reefs	f. Permanent habitat loss during operation – reefs	As discussed above, there is sufficient evidence from the aggregates dredging

Section/Paragraph	Natural England's Comments	Applicant's Response
	The impact to Annex I Reef is lasting/long term and site recovery wouldn't be assured, Natural England's view is that reasonable scientific doubt remains regarding the impact of the proposals on the conservation objectives for the site. Accordingly a precautionary approach is required. If it is considered that certain types of cable protection could be modified to enable a greater success of recovery/removal at decommissioning, whilst reducing wider designated site impact, then we advise that this would need to be reflected in the DCO/DML to ensure this mitigation is secured. Please see our Position Statement [NE.NB.D9.09.PS] for further details.	industry to indicate that impacted Annex 1 reef can rapidly recover from cable installation. Studies have shown that established *S. spinulosa* reef rapidly recovers after dredging operations (Pearce *et al* 2007). As discussed in the Information to Support HRA report (document 5.3) evidence suggests that recovery of thin encrusting reefs may commence rapidly, as demonstrated by surveys on the North Yorkshire coast whereby areas of *S. spinulosa* reef that had been lost due to storms had recolonised up to the maximum thickness (2 - 3cm) during the following summer (Holt, 1998). Studies within the Hastings Single Bank aggregate extraction area also found there to be rapid recolonisation of reefs (Pearce et al., 2007) The Applicant has provided an assessment, reflecting additional mitigation measures including decommissioning of cable protection in Additional information for the HHW SAC position paper, Annex 2 Assessment of Additional Mitigation in the HHW SAC (Version 2) submitted at Deadline 6 (REP6-019). This assessment reflects the long-term temporary nature of the habitat loss and given the small scale and likely recovery (as summarised above), the Applicant is confident that an AEoI can be ruled out. The commitment to agree the type of cable protection and ensure that cable protection will be decommissioned is secured through the HHW SAC control documents (DCO document 8.20), which state: • "*Prior to installation, the location, extent, type and quantity of any cable protection must be agreed with the MMO in consultation with Natural England";* and • "*Norfolk Boreas Limited has made a further commitment to decommission cable protection at the end of the Norfolk Boreas project life where it is associated with unburied cables due to ground conditions"*

Section/Paragraph	Natural England's Comments	Applicant's Response
		• *"Following further consultation with Natural England the commitment has been made within the DCO (Condition 3(1)(g) of the Transmission DMLs (Schedule 11 and 12of the DCO) to not employ rock or gravel dumping within the HHW SAC. This is to ensure that the type of cable protection chosen is suitable for decommissioning"*
P. 94 HHW SAC Sandbanks	g. New substrate during operation – The RIES states that the Applicant's conclusions have not been disputed by any Interested Parties. Natural England understands that the introduction of new substrate or cable protection during the operational phase would be subject to a separate marine licence.	Agreed
P. 95 HHW SAC Reefs	h) New substrate during operation - reefs Natural England understands that the introduction of new substrate or cable protection during the operational phase would be subject to a separate marine licence.	Agreed
P. 95 HHW SAC Reefs	i). Increased suspended sediment and smothering during construction – reef Natural England welcomes the opportunity to confirm its position. As set out in the Applicants Additional Mitigation measures documents and 8.20 control documents there is the intension to avoid Annex I reef features by a distance of 50m, therefore avoiding smothering effects from depositing Sandwave clearance sediment. However, there remains an outstanding concern that the sediment should be placed in areas of similar grain size (95% similar grain size condition for Norfolk Vanguard) so the habitats are not significantly changed and/or impact on other site features. Please see our Deadline 9 response for further detail.	Please see the SoCG between the Applicant and Natural England submitted at Deadline 10 [ExA.SoCG-17.D10.V4] for the latest position by both parties with regards to Natural England's outstanding concern that sediment removed during sandwave levelling should be placed in areas of similar grain size. All parties agree that it is for the SoS to decide if a condition is required.
P. 97 HHW SAC Sandbanks	j). Increased suspended sediment and smothering during construction Within the EIA the Applicant have considered deposition effects from Sandwave levelling etc. so there is an impact pathway and therefore a LSE during construction. As there is a LSE	As discussed in paragraph 75 of the Information to Support HRA report (document 5.3), increased suspended sediment (i.e. turbidity) and smothering would not have a physical impact on the sandbank as the material resuspended would be the same as that currently

Section/Paragraph	Natural England's Comments	Applicant's Response
	pathway smothering should be considered in the HRA Integrity Matrices. Natural England provided further advice at D9. For Annex I sandbank features we believe based on the information provided by the Applicant that there is unlikely to be an AEoI from smothering and increased suspended sediment as a result of site preparation works and construction activities as the benthic communities have a high tolerance to smothering and increased suspended sediments.	present and the communities associated with the sandbank are habituated to this sediment type, therefore the Applicant maintains that there would be no LSE. While the Applicant notes Natural England's disagreement regarding screening out of increased suspended sediment and smothering on Annex I Sandbanks, the Applicant welcomes Natural England's position that there will be no AEoI on Annex I Sandbanks resulting from increased suspended sediment and smothering.
P. 97 HHW SAC Sandbanks Reef	k) Decommissioning Natural England welcomes the opportunity to clarify its position in relation to AEoI on HHW SAC from decommissioning. The Applicant has drawn up a decommissioning plan that provides evidence on the feasibility of the removal of cable protection, which it suggests is more likely to be possible for concrete mattresses (or similar type product). Natural England welcomes the potential to successfully remove any cable protection. If removal could be achieved, then whilst the impacts would no longer be permanent, which is welcomed, they will still last for the lifetime of the infrastructure (30 years) and potentially longer as a residual impact. Therefore, because this impact is lasting/long term and site recovery wouldn't be assured, Natural England's view is that reasonable scientific doubt remains regarding the impact of the proposals on the conservation objectives for the site. Accordingly a precautionary approach is required. If it is considered that certain types of cable protection could be modified to enable a greater success of recovery/removal at decommissioning, whilst reducing wider designated site impact, then we advise that this would need to be reflected in the DCO/dML to ensure this mitigation is secured. Overall, whilst the additional work undertaken to refine the project parameters is welcomed and serves to considerably reduce the impacts of the project on the interest features of HHW SAC and the likelihood thereof, Natural England's overall position remains that an	As discussed above, the Applicant suggests that Natural England's position regarding potential lasting impacts on Annex I Reef and Sandbank as a result of cable protection (with a maximum area of 0.028km^2) following decommissioning of Norfolk Boreas is disproportionate and inconsistent when Natural England expects extensive recovery of *S. spinulosa* reef following extensive and repeated commercial fisheries dredging, should fisheries closure areas be adopted in the HHW SAC. The Applicant has provided an assessment, reflecting various additional mitigation measures including decommissioning of cable protection in Additional information for the HHW SAC position paper, Annex 2 Assessment of Additional Mitigation in the HHW SAC (Version 2) submitted at Deadline 6 (REP6-019). This assessment reflects the long-term temporary nature of the habitat loss and given the small scale (0.0016% of the SAC) and likely recovery (as summarised above), the Applicant is confident that an AEoI can be ruled out. The commitment to agree the type of cable protection and ensure that cable protection will be decommissioned is secured through the HHW SAC control documents (DCO document 8.20), which state: • *"Prior to installation, the location, extent, type and quantity of any cable protection must be agreed with the MMO in consultation with Natural England";* and • *"Norfolk Boreas Limited has made a further commitment to*

Section/Paragraph	Natural England's Comments	Applicant's Response
	AEoI to HHW SAC Sandbanks and Reefs cannot be excluded beyond all reasonable scientific doubt.	*decommission cable protection at the end of the Norfolk Boreas project life where it is associated with unburied cables due to ground conditions"* • *"Following further consultation with Natural England the commitment has been made within the DCO (Condition 3(1)(g) of the Transmission DMLs (Schedule 11 and 12of the DCO) to not employ rock or gravel dumping within the HHW SAC. This is to ensure that the type of cable protection chosen is suitable for decommissioning"*
P. 97 HHW SAC Sandbanks	m) In-combination effects – sandwaves For the avoidance of doubt the Annex I feature is 'Sandbanks' and not Sandwaves, which are the mobile part of the Annex I sandbanks. In considering the in combination effects on the Sandwaves Natural England has concluded that an AEoI on the Sandbank feature of HHW SAC cannot be excluded beyond all reasonable scientific doubt.	The Applicant's position regarding concluding no AEoI either alone or in-combination is explained in the Information to Support HRA report (document 5.3) and the Additional information for the HHW SAC position paper Annex 2 Assessment of Additional Mitigation in the HHW SAC (Version 2) submitted at Deadline 6 (REP6-019). The worst case scenario in-combination effects for Norfolk Boreas and Norfolk Vanguard are based on 4.9km^2 short term temporary disturbance area during installation (0.3% of the SAC) and 0.05km^2 long term temporary habitat loss associated with cable protection (0.003% of the SAC), this scale of effect is comparable with habitat loss on a number of other European sites for which AEoI was ruled out and development consent granted, as summarised in Natural England (2016), including: • Hinkley Point C - habitat loss of a small area of potential Sabellaria reef within the rock armour barge berthing and unloading area. This area equated to less than 0.05% of the SAC reef feature and was not considered significant. • Walney Extension - habitat loss of intertidal mudflats and sand flats due to cable installation and rock armour. 0.41% of overall 600ha of feature was affected and the Appropriate Assessment concluded no AEoI. • Kentish Flats Extension - habitat loss of 0.003% of Special
P. 98 HHW SAC Reef	n) In-combination effects – Reef In considering the in combination effects on the Annex I feature Reefs within the HHW SAC Natural England have concluded that an AEoI on the Annex I Reef feature cannot be excluded beyond all reasonable scientific doubt.	

Section/Paragraph	Natural England's Comments	Applicant's Response
		Protection Area (SPA). The Secretary of State (SoS) and Natural England agreed this loss to be negligible. The Applicant therefore maintains that an AEoI can be ruled out for Norfolk Boreas alone and in-combination.

2.8 Applicant's Response to Natural England's Appendices 1 to 3

Table 8 Applicant's Response to Natural England Appendices in Natural England's comments on the Report on the Implications for European Sites (RIES)

Appendix no.	Natural England's Appendix title	Applicant's Response
1	Natural England's comments on Norfolk Boreas Habitat Regulation Assessment Screening and Integrity Matrices	The Applicant notes that Natural England's Deadline 7 submission (REP7-050) has been incorporated in the RIES where appropriate, which the Applicant responded to at Deadline 9 (REP9-010).
2	Natural England's advice to SoS in in relation to Hornsea Project 3 OWF	The Applicant welcomes the sharing of information from other projects however considers that all key points of relevance have been reflected in Natural England's submissions regarding Norfolk Boreas. The Applicant has therefore not provided detailed responses to all comments in Appendices 2 and 3.
3	Natural England's advice to SoS in relation to Norfolk Vanguard OWF	

3 Applicant's Response to RSPB's Comments

Table 9 Applicant's Response to RSPB Comments

Section of RSPB response	RSPB's Comment	Applicant's Response
5.1	The RSPB has reviewed the RIES and considers it represents an accurate overview of the offshore ornithology discussions. It helpfully summarises the key points being debated and clearly sets out the areas of agreement and disagreement. There are, however, a few areas that we wish to provide comments on in order to clarify our position or ensure accuracy:	The Applicant has no comment on this.
a) Comments on the Applicant's Screening matrices submitted at Deadline 6		
5.2	The RSPB notes the comment made by the Applicant with regards the Galloper Offshore Wind Farm impacts on the lesser black-backed gull population of the Alde-Ore Estuary SPA. For clarity, the RSPB was not able to conclude no adverse effect on integrity for that project based on the	The Applicant has been unable to identify the comment the RSPB is referring to in the Screening matrices. The only reference to the Galloper wind farm that the Applicant has found was the final sentence in the footnote

Section of RSPB response	RSPB's Comment	Applicant's Response
	collision risk modelling that was presented. The reasons for our concerns remain, as the population continues to be unfavourable and ongoing work continues to be required to restore the population in line with the Alde-Ore Estuary SPA conservation objectives.	of the Alde-Ore Estuary SPA Integrity matrix [REP6-007]: *It is also of note that the Galloper wind farm was consented on the basis of in-combination collision risk estimates of between 119 (the applicant's estimate) and 357 (Natural England's estimate), which even at the lower end is twice the current in-combination estimate of 54.* Thus, while the Applicant acknowledges the RSPB's comment, it notes that the Secretary of State was able to conclude no AEoI.
b) Offshore features for which there is not agreement that AEoI can be ruled out (p.30).		
5.3	The RSPB notes that Natural England have concluded no AEoI (alone or in-combination) for gannet, guillemot, razorbill and the seabird assemblage if Hornsea Three and Four are excluded from the in-combination assessment. The RSPB accepts a reduction in potential impact following the further mitigation measures, but still considers there to be sufficient scale of impact that an in-combination AEoI on gannet and the seabird assemblage cannot be ruled out. We set out our reasons for this in Section 2 above.	The Applicant notes this disagreement in conclusions between those reached by the RSPB and those reached by Natural England and the Applicant.
c) Headroom (p.34)		
5.4	The RSPB notes the Natural England position summarised in paragraphs 4.8.18 and 4.8.19 (p.34), which highlights the continued level of uncertainty inherent within the assessment process. The RSPB supports Natural England's position that until an agreed approach is developed assessments must be based on the consented designs. The Scottish Government agency Marine Scotland Science has recently awarded a tender for the Production of Cumulative Effects Framework for Key Ecological Receptors and it is anticipated that this will help to address the need for an agreed approach to cumulative assessment in terms of consented and as-built designs. Clearly, however, the results of this work will not be available before the end of the Boreas examination.	The Applicant welcomes the RSPB's agreement that collision impacts should be updated to reflect as-built designs rather than consented ones and agrees that the Marine Scotland Cumulative Effects Framework will provide a useful method to do this. However, since this project has only just commenced and has a projected two year timetable, there is a need to take this into account more urgently than that project will be able to.
5.5	The RSPB continues to have concerns about the concept of headroom as we consider it runs counter to the principles of sustainable development. The industry should be aiming to achieve maximum capacity for	The Applicant agrees that presenting re-established cumulative collision totals is the key priority. However, the Applicant considers that the concept of headroom is appropriate from a decision-making perspective as it

Section of RSPB response	RSPB's Comment	Applicant's Response
	least environmental effect, not simply looking to fully exploit the perceived available environmental capacity. The report implies that the calculated 'headroom' for each species is simply expendable. As would be expected, we strongly disagree with this proposition, especially when considering protected species. A more appropriate approach would be to simply present the re-established cumulative totals, without referring to any available headroom. It is for the decision-maker to determine whether predicted impacts of any future proposals are acceptable.	provides context for decisions in relation to past decisions.
5.6	Currently projects are being examined and consented without strategic oversight to determine which projects would be least environmentally damaging and therefore most appropriate to consent. There appears to be a growing need to develop such an approach to ensure offshore wind commitments will be met in the most sustainable way, but regrettably this is not yet in place.	The Applicant acknowledges the RSPB's comment on this issue, and considers it very important to highlight that Norfolk Boreas has very low ornithological impacts, a fact acknowledged by Natural England (e.g. REP9-045: 'it is recognised that the Projects contributions to the in-combination mortality totals is small, when compared to other projects'), and therefore the project should satisfy the RSPB's proposed requirements for being appropriate to consent. In addition, in Norfolk Boreas' firm opinion the revised collision estimates for all species are now comparable to, or lower than, those for consented projects and on a per megawatt basis, Norfolk Boreas's impacts are an order of magnitude lower than those for most North Sea offshore wind farms consented in the last five years
d) Kittiwake flight speeds (pp.35-36)		
5.7	The RSPB has provided detailed comments on this in Section 2 above. We support the position set out by Natural England that speeds are variable and the evidence does not support the proposed amendment by the Applicant, as it risks underestimating potential collision impacts.	The Applicant has provided a response to this point in ExA.ASR.D10.V1. Table 1.22.
e) Kittiwake tracking data (paragraph 4.8.33, p.36)		
5.8	The RSPB has set out in our response in our comments on the Offshore Ornithology Assessment update (AS-041) why the Applicant's concerns about the tracking data is inaccurate. We do not have anything further to add, but request that our position be noted fully in the RIES.	The Applicant has been unable to find any mention of tracking data in AS-041. However the Applicant has provided responses in REP3-007 to comments on this topic made by the RSPB in their Relevant Representation (RR2-096).
Concluding Comments		

Section of RSPB response	RSPB's Comment	Applicant's Response
6.1	The RSPB welcomes the further mitigation measures proposed by the Applicant during the examination process and we have revised our position in light of the updated impact assessments based on the increased turbine draught height. It is with regret, however, that despite the predicted reductions in impacts to the SPA qualifying features, the scale of change predicted as a consequence of the Boreas development, in-combination with other projects, compared to unimpacted populations, remains such that the RSPB finds it impossible to conclude no adverse effect on integrity on the Flamborough and Filey Coast SPA and the Alde-Ore Estuary SPA as a result of collision mortality. We therefore welcome the Applicant's 'In Principle Habitats Regulations Derogation Provision of Evidence', submitted at Deadline 7, which we will provide comments on by Deadline 10.	The Applicant notes the RSPB's position, but disagrees with the conclusions reached on in-combination impacts for the reasons set out above and in previous submissions (e.g. REP2-035, REP5-059, REP6-024). The Applicant also looks forward to receiving the RSPB's comments on the Derogation submission [REP7-024].

4 Conclusion

11. Based on the Information to Support HRA report (document 5.3) and various additional submissions to the Examination, the Applicant maintains the position that Norfolk Boreas will have no AEoI, either alone or in-combination, on any European sites screened into the HRA, taking into account mitigation measures which are secured through the DCO and associated certified documents.

5 References

Holt, T.J., Rees, E.I., Hawkins, S.J. & Seed, R. (1998). Biogenic reefs (volume IX). An overview of dynamic and sensitivity characteristics for conservation management of marine SACs. Scottish Association for Marine Science (UK Marine SACS Project). 170 pp.
Natural England (2016) Small-scale effects: How the scale of effects has been considered in respect of plans and projects affecting European sites - a review of authoritative decisions. Available at: http://publications.naturalengland.org.uk/file/5158169750798336
Pearce, B., Taylor, J., Seiderer, L.J. (2007) Recoverability of Sabellaria spinulosa Following Aggregate Extraction: Marine Ecological Surveys Limited.