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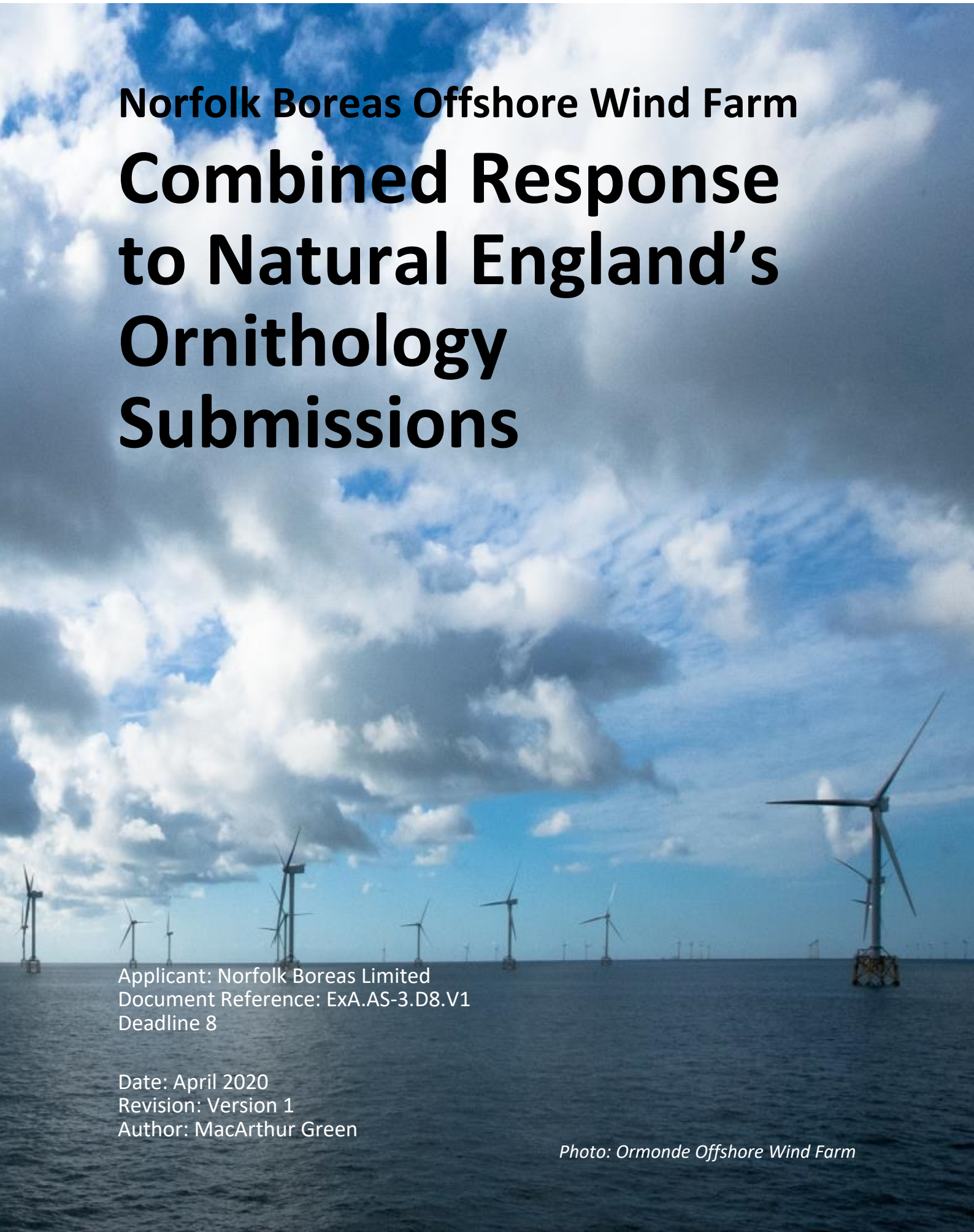

Norfolk Boreas Offshore Wind Farm

Combined Response to Natural England's Ornithology Submissions

Applicant: Norfolk Boreas Limited
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Deadline 8

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Glossary of Acronyms

AEoI	Adverse effect on integrity
CRM	Collision risk modelling
DCO	Development consent order
FFC	Flamborough and Filey Coast
HRA	Habitats Regulations Assessment
LBBG	Lesser black-backed gull
MW	Megawatt
PVA	Population viability analysis
SPA	Special protection area

1 Introduction

1. This document provides the Applicant's response to points raised by Natural England in the following Deadline 7 submissions:

   - REP7-047 Natural England's advice on Norfolk Boreas' updated cumulative (EIA) and in-combination (HRA) collision risk offshore ornithological assessment;
   - REP7-048 Natural England's Updated Ornithology Advice; and,
   - REP7-052 Updated Ornithology Collision Risk Modelling Advice.

2. Note that the Applicant has provided responses to the other Natural England Deadline 7 ornithology submissions elsewhere as follows:

   - ExA.ASR-NE.D8.V1: Applicant's Response to Natural England's REP7-045 and REP7-046; and
   - ExA.WQR-3.D8.V1: Applicant's Comments on Responses to the Examining Authority's Third Round of Written Questions.

1.1 REP7-047 Natural England's advice on Norfolk Boreas' updated cumulative (EIA) and in-combination (HRA) collision risk offshore ornithological assessment

1.1.1 Main comments

1.1.1.1 1.1 Updated cumulative and in-combination collision figures presented by the Applicant in REP6-024

3. The Applicant welcomes Natural England's 'broad agreement' with the updated cumulative and in-combination totals and assessment. The Applicant considers that in fact Natural England and the Applicant are in agreement with the assessment methods and estimated figures, and it is only the conclusions of some of the cumulative and in-combination assessments that remain to be agreed. In the following sections the Applicant has provided responses to points on which the Applicant and Natural England have not reached agreement with additional clarification as necessary.

4. Natural England has commented on the sea level reference point used in relation to turbine draught height (i.e. which sea level datum is used) and the wording to be used in the DCO to ensure the assessed project design is secured. These comments have been addressed by the Applicant in the Applicant's Deadline 7 Submission - Offshore Ornithology Update - Response to Natural England's Submission EV9-003 and Further Comments to REP4-040 (REP7-031).

5. Natural England recommended that in Table 2.2 of REP6-024 (kittiwake cumulative and in-combination collisions) the total row which includes Hornsea Project Three is

checked. The Applicant has checked this row and has noted an error in the summing which has been corrected.

6. In addition Natural England recommended that the Spring and Autumn apportioning rates for gannet from Flamborough and Filey Coast Special Protection Area (SPA) be checked for the Norfolk Boreas and Norfolk Vanguard projects. The rates (6.2% and 4.8%, respectively) had been applied the wrong way around. This error has now been corrected.

7. In order to simplify the documents REP6-024 has been re-submitted in its entirety (as a revised version; ExA,AS-4.D8.V2) at Deadline 8 with these errors corrected. For neither kittiwake nor gannet do these updates have any material effect on the assessment conclusions (and this was also noted by Natural England in REP7-047).

8. With respect to Natural England's comments on headroom, the Applicant set out its position in REP6-021 and has also responded to additional written questions on this topic (REP7-017) and provided responses to points made by Natural England in ExA.WQR-3.D87.V1 and ExA.ASR-NE.D8.V1.

1.1.2 Summary of Natural England Advice

9. The Applicant welcomes Natural England's agreement that the project alone will not have any significant impact on any species at the EIA scale and will not result in any Adverse Effects on Integrity (AEoI) of Special Protection Area (SPA) populations due to collision risk (note that Natural England has also agreed this for all displacement impacts: REP4-040 and REP7-045).

10. However, Natural England considers that, even after the mitigation presented in REP5-059, which reduced collision estimates by between 63% and 74% compared with the original submission, the project still makes '*a meaningful contribution*' to the cumulative and in-combination effects on several seabird species at both the EIA scale and with respect to Special Protection Area (SPA) colonies.

11. The Applicant considers Natural England's position over-states the level of contribution from Norfolk Boreas. Total (i.e. EIA scale) collisions have been reduced to:

- Gannet - **1%** of the cumulative total (including and excluding the Hornsea Projects);
- Kittiwake - **1.5%** of the cumulative total (excluding the Hornsea Projects and **1.3%** including them);
- Lesser black-backed gull – **2.7%** of the cumulative total (excluding the Hornsea projects and **2.5%** including them);

- Herring gull – **less than 1%** of the cumulative total (including and excluding the Hornsea Projects); and
- Great black-backed gull – **3.6%** of the cumulative total (excluding the Hornsea projects and **3.4%** including them).

12. Despite the fact that the generating capacity for the wind farm (1800MW) is one of the largest for any wind farm included in the assessment the above collision estimates are all less than 4% of the relevant totals. On this basis it is the Applicant's firm position that the Norfolk Boreas project does not make a meaningful contribution to cumulative totals for any of the relevant sea bird colonies.

13. The Applicant also considers it highly relevant that in the final statement of common ground (SoCG) for the consented East Anglia THREE Wind Farm (East Anglia THREE SoCG, Table 5 – Offshore Ornithology; ExA.ASR-NE.D8.V1, Appendix 1), Natural England stated that:

- An in-combination collision mortality of 58 lesser black-backed gulls would not result in an adverse effect on the integrity (AEoI) for the Alde-Ore Estuary SPA, with East Anglia THREE contributing 1.8 to this total; and,
- Although an AEoI could not be ruled out for an in-combination collision mortality of 319 kittiwakes from the Flamborough and Filey Coast SPA, the contribution from East Anglia THREE of 7.8 while not de minimis was so small as to not materially alter the significance or likelihood of an AEoI.

14. For lesser black-backed gull these mortality estimates are almost identical (and the in-combination is slightly higher) to those for Norfolk Boreas (alone 1.6 – 2.1 and in-combination 54.2), while for kittiwake the project alone estimate for East Anglia THREE (7.8) is higher than the Applicant's estimate for Norfolk Boreas (6.1) and only 6 higher than the precautionary value estimated by Natural England (14), with the in-combination total increased to 363 (when the Hornsea projects are excluded).

15. On this basis, and noting that that Norfolk Boreas has very similar impact magnitudes to those for the consented East Anglia THREE Wind Farm, it is the Applicant's firm position that the Norfolk Boreas project does not make a meaningful

or material contribution to cumulative impacts at the wider scale nor to in-combination totals for any of the relevant SPA sea bird colonies.

1.1.3 Appendix 1: Natural England detailed comments/conclusions on Norfolk Boreas updated cumulative (EIA) collision risk offshore ornithological assessment, submitted at Deadline 6 [REP6-024]

16. The Applicant has provided responses to Natural England's interpretation of the Population Viability Analysis (PVA) in response to WQ 3.2.1.1 in ExA.WQR-3.D8.V1, and this includes justifications for reaching conclusions of no significant impacts.

17. The Applicant reiterates the consideration in REP2-035, further demonstrated following the design mitigation to reduce collision risks (REP5-059 and REP6-024), that the project will not result in any significant adverse effects as a result of cumulative collisions for any species.

1.1.4 Appendix 2: Natural England detailed comments/conclusions on Norfolk Boreas updated in-combination (HRA) collision risk offshore ornithological assessment, submitted at Deadline 6 [REP6-024]

18. The Applicant welcomes Natural England's agreement that AEoI can be ruled out for all SPA features due to the project alone and also in-combination with other plans and projects when Hornsea Project Three and Four are excluded for all species with the exception of kittiwake and lesser black-backed gull.

19. The Applicant has provided responses to Natural England's interpretation of the Population Viability Analysis (PVA) in response to WQ 3.2.1.1. in ExA.WQR-3.D8.V1, which includes justifications for reaching conclusions of no AEoI.

20. The Applicant reiterates the consideration in REP2-035, further demonstrated following the design mitigation to reduce collision risks (REP5-059 and REP6-024), that the project will not result in any significant adverse effects as a result of in-combination collisions with other plans or projects for any species.

1.2 REP7-048 Natural England's Updated Ornithology Advice

1.2.1 Advice on Norfolk Boreas Offshore Ornithology Assessment Update: Project Alone Collision Risk Modelling

1.2.1.1 General Comments

21. The Applicant welcomes Natural England's review and agreement with the updated project alone collision risk assessment (REP5-059). Natural England has requested that the complete set of input parameters for the Collision Risk Model (CRM) is included in this document, and this was submitted in a revised version of this submission at Deadline 7 (REP7-029).

1.2.1.2 EIA collision impacts from Norfolk Boreas alone

22. The Applicant welcomes Natural England's agreement that collision risk at Norfolk Boreas will have no significant adverse impact at the EIA scale for all species.

1.2.1.3 HRA collision impacts from Norfolk Boreas alone

1.2.1.3.1 Flamborough & Filey Coast (FFC) SPA: Gannet

23. The Applicant welcomes Natural England's agreement that an Adverse Effect on Integrity (AEoI) of the Flamborough & Filey Coast Special Protection Area (SPA) can be ruled out for gannet collisions due to the project alone and also for collisions and displacement combined.

1.2.1.3.2 Flamborough & Filey Coast (FFC) SPA: Kittiwake

24. The Applicant welcomes Natural England's agreement that an Adverse Effect on Integrity (AEoI) of the Flamborough & Filey Coast SPA can be ruled out for kittiwake collisions due to the project alone.

1.2.1.3.3 Alde-Ore Estuary SPA: Lesser black-backed gull (LBBG)

25. The Applicant welcomes Natural England's agreement that an Adverse Effect on Integrity (AEoI) of the Alde-Ore Estuary SPA can be ruled out for lesser black-backed gull collisions due to the project alone.

1.2.1.4 Detailed Comments

1.2.1.4.1 Increases to draught height

26. Natural England has requested clarification on the sea level datum used to define rotor draught height. A detailed explanation of draught height, sea level datums and how these are used in collision risk modelling was provided by the Applicant at Deadline 7 (REP7-031). The assessment is unaffected by these clarifications and the Applicant considers that this has provided all the additional data requested by Natural England.

1.2.1.5 Minor Comments

27. The Applicant provided responses to Natural England's minor comments (which were first provided in EV9-003) in the Deadline 7 submission (REP7-031). No further clarifications are therefore required.

1.2.1.6 Advice on Norfolk Boreas Review of Kittiwake Flight Speed for use in Collision Risk Modelling

28. The Applicant welcomes Natural England's review of the kittiwake flight speed review submitted at Deadline 5 (REP5-060) and the generally supportive comments provided.

29. The Applicant notes that Natural England has suggested that kittiwake collision risks are presented using '*the currently used value from the literature (i.e. 13.1m/s) and the value from the work undertaken by the Norfolk Boreas consultants in REP5-060 are used in the CRM'.* Natural England also suggest that one of the values reported (from Masden 2015) is not included on the basis that this may have been unreliable. With this value removed the mean flight speed estimate is 11.3m/s, while with this value included (as presented in REP5-060) the mean is 10.8m/s. The difference in collision risk using both of these mean flight speed estimates when compared with the current standard are provided below.

30. The Applicant has applied this adjustment in the collision risk modelling as suggested by Natural England to provide an indication of how reducing the kittiwake flight speed from 13.1m/s to 10.8m/s (as estimated in REP5-060) and 11.3m/s (as suggested by Natural England) affects the mortality estimates (Table 1.1).

31. Adjusting the flight speed parameter reduces the collision mortality estimates by 9% to 11.5%, with the total annual decreasing from 57.5 to 52.2 (using 11.3m/s) and 50.8 (using 10.8m/s) and the number apportioned to the Flamborough and Filey Coast SPA from 14 to 12.7 and 12.4 respectively (using Natural England's methods) and from 6.1 to 5.5 and 5.4 respectively (using the Applicant's methods). Note that using the lower collision values this would reduce the percentage of the cumulative total noted above (section 1.1.2) from 1.3% to 1.1% (excluding the Hornsea Projects) and from 1.4% to 1.3% (including the Hornsea Projects).

32. This further highlights the degree of precaution in the collision risk for this species.

Table 1.1 Comparison of kittiwake collision risk estimates for flight heights of 13.1m/s and 10.8m/s. These were calculated using the same parameters as presented in REP7-029.

Flight speed (m/s)	EIA total annual collisions	Flamborough and Filey Coast SPA	
		Natural England preferred method	The Applicant's preferred method
13.1	57.5	14	6.1
11.3	52.2	12.7	5.5
10.8	50.8	12.4	5.4

1.3 REP7-052 Natural England's Updated Ornithology Collision Risk Modelling Advice

1.3.1 Natural England's Advice on Norfolk Boreas Offshore Ornithology Assessment Update: Project Alone Collision Risk Modelling [as set out in REP5-059 from the Applicant]

1.3.1.1 General Comments

33. The comments from Natural England in this submission were the same as those in REP7-048. Responses to these were submitted by the Applicant at Deadline 7 (REP7-031) and are also summarised above in section 1.2.