

Norfolk Boreas Offshore Wind Farm Clarification Note Optimising cable routeing through the HHW SAC

Applicant: Norfolk Boreas Limited
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Deadline 4

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Photo: Ormonde Offshore Wind Farm

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Table of Contents

1	Introduction	1
2	Plan showing seabed features of archaeological interest and Annex 1 reef features .	1
3	Optimising cable routeing through the HHW SAC to manage risks of potential additional archaeological constraints affecting the conservation objectives of the SAC.	3
3.1	Micrositing in constrained areas	3
4	Mechanisms for managing both interests	7
4.1	Archaeology and the WSI	7
4.2	Features of the HHW SAC and the HHW SAC SIP	7
5	Conclusion.....	7

Table of Figures

Figure 1	Areas to be managed as <i>S.spinulosa</i> reef and AEZs.....	2
Figure 2	Areas to be managed as <i>S.spinulosa</i> reef AEZs and A2 Anomalies	6

Glossary of Acronyms

AEZ	Archaeological Exclusion Zone
EIFCA	Eastern Inshore Fisheries and Conservation Area
HHW	Haisborough Hammond and Winterton
ISH	Issue Specific Hearing
Km	Kilometres
MMO	Marine Management Organisation
SAC	Special Area of Conservation
SIP	Site Integrity Plan
WSI	Written Scheme of Investigation

1 Introduction

1. This clarification note has been prepared in response to Hearing Action point 9 of the Norfolk Boreas Issue Specific Hearing (ISH) 4 - Offshore Effects including the draft Development Consent Order.

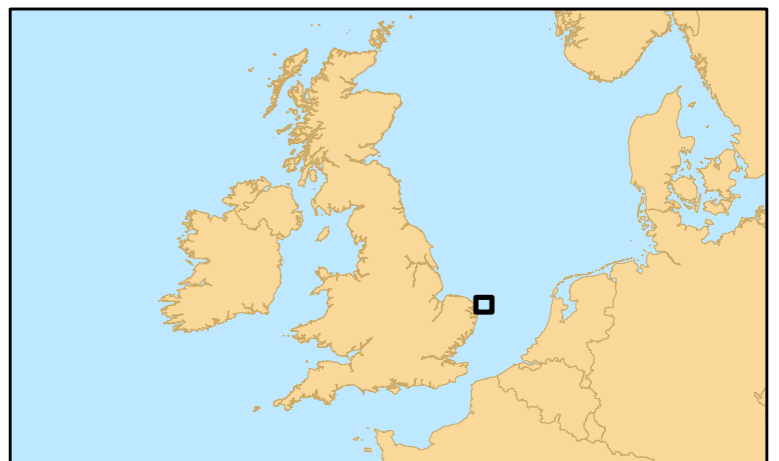
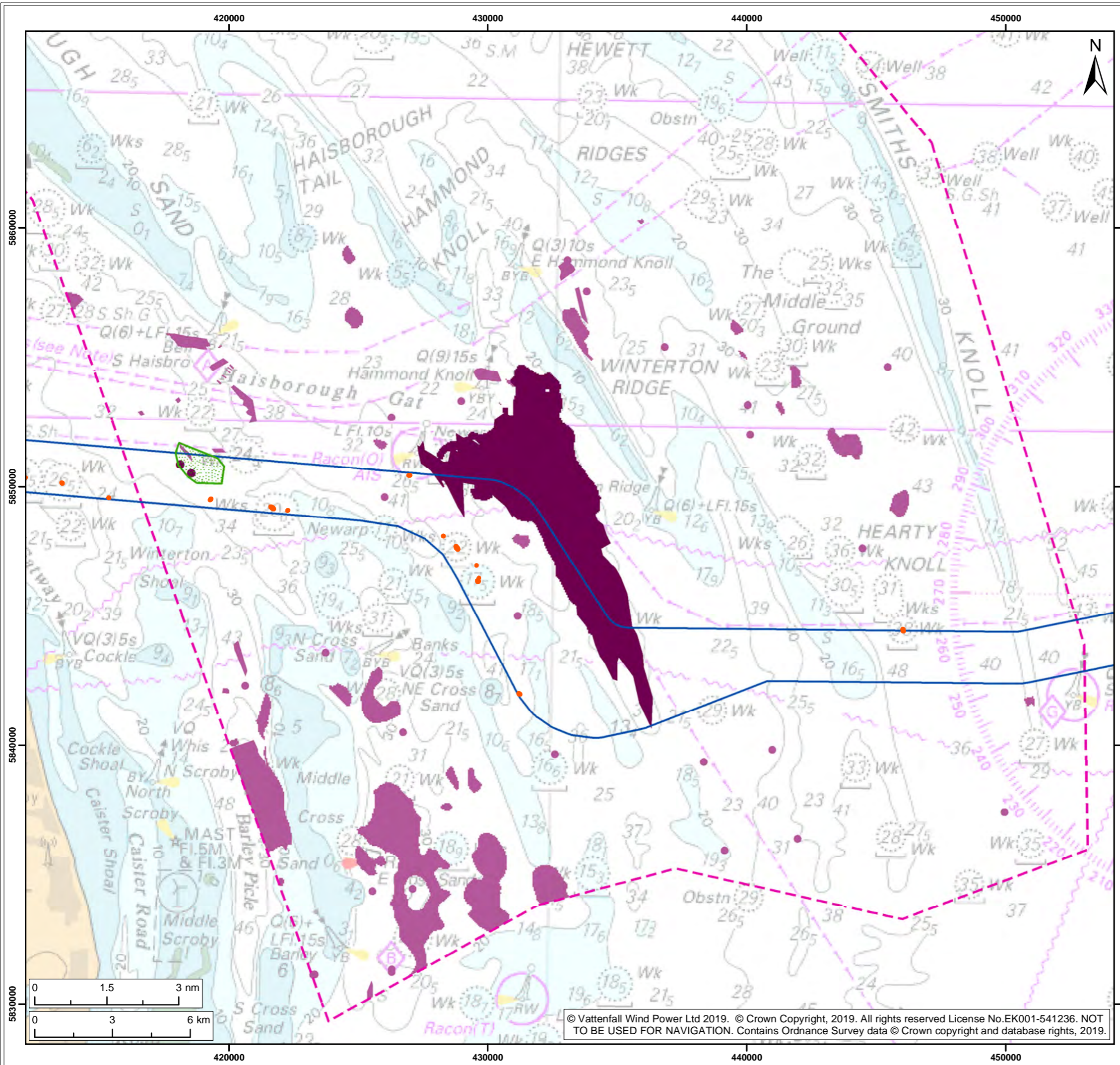
Action Point 9:

“Submit plan showing the relationship between seabed features of archaeological interest and Annex 1 reef features and note on optimising cable routeing through the HHW SAC to manage risks of potential additional archaeological constraints affecting the conservation objectives of the SAC.”

2. This clarification note contains both the plan (section 1) as requested and information on how the route will be optimised to manage risks (sections 3 and 4).

2 Plan showing seabed features of archaeological interest and Annex 1 reef features

3. Figure 1 shows areas to be managed as *S.spinulosa* reef (as defined by Natural England and JNCC) and Archaeological Exclusion Zones (AEZs). This figure was presented at Issue Specific Hearing 4 of the Norfolk Boreas Examination to allow discussions relating to the ability to microsite within the Haisborough Hammond and Winterton (HHW) Special Area of Conservation (SAC). For further detail on these discussions please see the Written Summary of the Applicant’s Oral Case at Issue Specific Hearing 4, Offshore effects, including the draft Development Consent Order (document ExA.ISH4.D4.V1).



- Legend:
- Offshore cable corridor
 - Archaeological Exclusion Zone (AEZ)
 - EIFCA Byelaw Area
 - Haisborough, Hammond and Winterton SAC¹
 - Top priority areas to be managed as *S. spinulosa* reef²
 - Area to be managed as *S. spinulosa* reef (Natural England)²

¹ JNCC, 2019.
² Natural England/MALSF, 2013/2011

Project: Norfolk Boreas	Report: Clarification Note: Optimising cable routeing through the HHW SAC
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Title:
Areas to be managed as *S. spinulosa* reef and AEZs

Figure: 1	Drawing No: PB5640-008-004-002				
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	16/01/2019	GC	DT	A3	1:145,000

Co-ordinate system: ETRS 1989 UTM Zone 31N EPSG: 25831

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3 Optimising cable routing through the HHW SAC to manage risks of potential additional archaeological constraints affecting the conservation objectives of the SAC.

4. The final cable route will need to be located to mitigate for many different constraints. For this reason, the offshore cable corridor has been designed to allow for flexibility to mitigate impacts through avoidance. The corridor is between 2km and 4.7km wide which offers flexibility to route the one or two export cables required for Norfolk Boreas and the two export cables required for Norfolk Vanguard to avoid all sensitivities (as demonstrated in section 3.1 below). As described in the Environmental Statement (Chapter 5 [APP-218]) the width of disturbance caused by the installation of each export cable would be up to 30m.
5. Within the HHW SAC and at the point which has been identified by Natural England as one of the Priority Areas to be managed as *S.spinulosa* reef (the large dark purple area in Figure 1), the offshore cable corridor is up to 4.7km wide. This will allow more flexibility for micrositing in what would otherwise be one of the more constrained sections of the corridor.
6. The most constrained area within the SAC when considering *S.spinulosa* reef and archaeological interest is where the proposed Eastern Inshore Fisheries and Conservation Authority (EIFCA) byelaw area is located (the green area shown in Figure 1). This much smaller Priority Area to be managed as *S.spinulosa* reef is identified by the smaller dark purple areas within the green byelaw area in Figure 1.

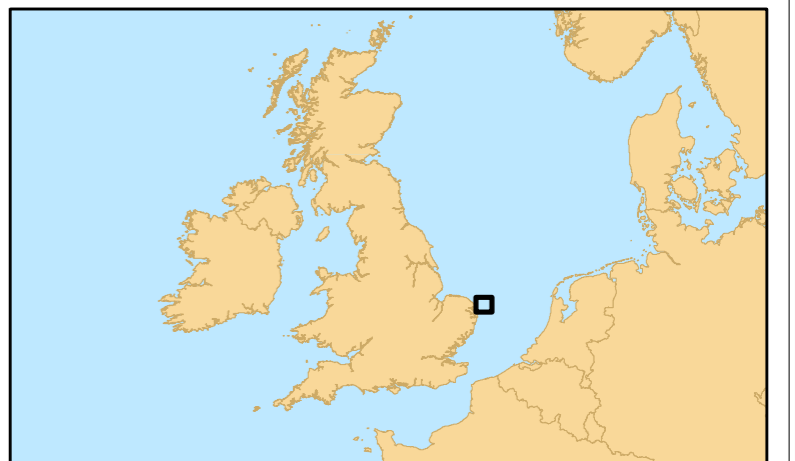
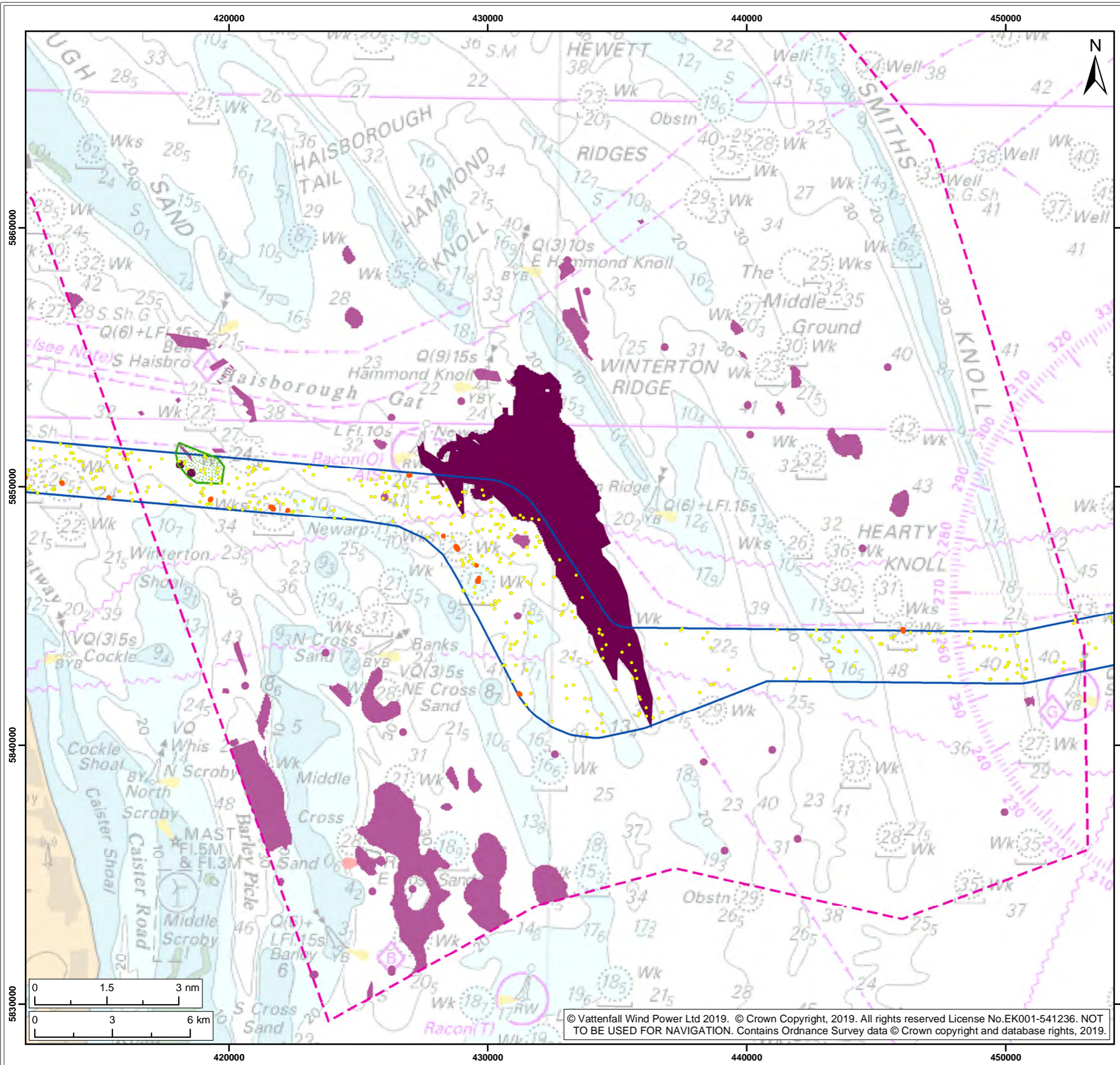
3.1 Micrositing in constrained areas

7. There are nine locations where AEZs have been proposed within the HHW SAC. One of these is located to the south of the proposed EIFCA fisheries management byelaw area. The Applicant understands a proposal for this will be submitted in March/April 2020 and that it would then come into effect sometime in the Autumn of 2020 [WQ8.5.4. REP2-069].
8. Although at this location the AEZ and the Priority Areas to be managed as *S.spinulosa* reef may restrict the room available for micrositing the Applicant maintains that there is sufficient space (given the space required as described in paragraph 4) for a route to be identified between the two constraints.
9. It should be noted that the Applicant has now committed to not placing cable protection within the "Priority Areas" to be managed as *S.spinulosa* reef (dark purple areas in Figure 1) and although Priority Areas are located within the smaller EIFCA byelaw area they do not extend across its full extent. However, it should also be noted that the further study undertaken (Reported in Appendix 3 of the updated

outline HHW SAC SIP [REP1-033]) indicates that no cable protection would need to be placed within the EIFCA byelaw area.

10. As illustrated in Plate 5.2, section 5.2.1 of the outline HHW SAC SIP [REP1-033] the width required to install the four export cables required for Norfolk Boreas and Norfolk Vanguard would be up to 490m if cables were installed side by side in water depths of 48m. The equivalent width required to install Norfolk Boreas cables side by side is 250m. The proximity at which one cable can be installed to another is governed by water depth with deeper water meaning greater separation distances have to be maintained. 48m is the maximum water depth within the offshore cable corridor and hence 490m is the maximum possible width of the cable route should it combine all Norfolk Boreas and Norfolk Vanguard cables installed side by side.
11. As discussed above the most restricted part of the offshore cable corridor is likely to be between the smaller Priority Area located within the proposed EIFCA byelaw area and the AEZ to the south. The water depth here is around 35m and therefore the cables could be installed closer together in this area if required such that the space required to install all cables side by side would be reduced.
12. Alternatively cables may be routed separately to avoid impacts, for example, three cables may pass to the north of an AEZ and one cable may pass to the south or two cables may pass to the north and two to the south and so on. As stated above the space required to install a single cable while avoiding sensitive features would be up to 30m.
13. The area between the southern boundary of the EIFCA byelaw area and the AEZ is approximately 542m and therefore there would be adequate room for installing the Norfolk Boreas and Norfolk Vanguard cables side by side within this area as that would require an area of up to 490m. There is also an area between the AEZ and the southern boundary of the offshore cable corridor of 244m which would be enough space to install both Norfolk Boreas cables given the water depth at this location.
14. Therefore there are a number of options available for micro-siting both the Norfolk Vanguard and Norfolk Boreas cables to avoid both the AEZ, the areas to be managed as *S.spinulosa* reef and any additional *S.spinulosa* reef identified as part of the pre-construction surveys.
15. As set out above, it should be noted that the Applicant has committed to avoiding installing cable protection within the Priority Areas (shown as dark purple in Figure 1) which does not extend across the entire EIFCA byelaw area, and that the AEZs are not a hard constraint and can with the appropriate mitigation be modified or removed.

16. There are also numerous A2 anomalies within the SAC; as shown in Figure 2. As stated in the Written Scheme of investigation “*AEZs have not been proposed for the A2 anomalies. Additional work will be required to further investigate the nature and extent of anomalies, to establish the archaeological interest and to record them prior to removal, if they cannot be avoided through micro-siting of design*”.
17. It should also be noted that the A2 anomalies presented in Figure 2 are single data points and do not represent a geographical area on the map. Therefore, the map appears more congested than would be the case on the ground.
18. Through comparison with other offshore wind farm projects it is considered that following archaeological investigations, only a small percentage of A2 anomalies are likely to be confirmed as being of archaeological interest, with an even smaller number being given protection by AEZs. Thus the A2 anomalies presented in Figure 2 do not represent a hard constraint. In the event that an A2 anomaly could not be avoided then other mitigation, as agreed with Historic England, would still be possible.
19. There are a number of A2 anomalies to the south of the EIFCA byelaw area. Due to the reduced area for cable routeing in this area, it is likely that these will require further investigation as the cable route is likely to interact with these features. Further investigation will take the form of the pre-construction geophysical and drop down video surveys as outlined in the In Principle Monitoring Plan [REP1-029].
20. Given current available evidence, the Applicant considers that it will be possible to microsite to avoid both areas to be managed as *S.spinulosa* reef and AEZs. However should at the time of construction there have been a significant increase in the extent of *S.spinulosa* reef and a high number of A2 anomalies given AEZs, it would still be possible to proceed without significant impact for the following reasons:
 - As stated in the outline WSI [APP-697] “*where anomalies or AEZs cannot be avoided or where unexpected discoveries are encountered and reported through the protocol. This may include measures to further investigate the nature and extent of anomalies and/or discoveries, to establish the archaeological interest and to record them prior to removal.*”; and
 - As described in the HHW SAC SIP [REP1-033] the Applicant has committed to micrositing where possible. Should *S.spinulosa* reef be so extensive at the time of construction that micrositing to avoid reef completely is not possible, routeing will then be undertaken to minimise effects as far as possible (see Appendix 1 of the HHW SAC SIP) and in this situation the area of reef affected would be so small as to not cause an adverse effect on integrity



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 - A2 Anomalies

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Project: Norfolk Boreas	Report: Clarification Note: Optimising cable routing through the HHW SAC
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Title:
Areas to be managed as *S. spinulosa* reef and AEZs
and A2 Anomalies.

Figure: 2	Drawing No: PB5640-008-004-003				
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: ETRS 1989 UTM Zone 31N EPSG: 25831

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4 Mechanisms for managing both interests

21. Many offshore wind farm projects to date have had a commitment to microsite to avoid Annex 1 habitats where possible as well as a commitment to avoid AEZs. To date, the Applicant is not aware of any instances where it has not been possible to microsite so as to minimise impacts on both interests.

4.1 Archaeology and the WSI

22. As stated in the outline WSI [APP-697], prior to the acquisition of further survey data during the pre-construction phase it is recommended that a *“data review is undertaken by a suitability qualified and experienced archaeological contractor.”*
23. Furthermore, the WSI states that Historic England will be consulted on the scope of all further geophysical surveys undertaken for the project in order to ensure that the data generated are sufficiently robust to meet these archaeological objectives and to enable professional archaeological interpretation and analysis.
24. The final pre-construction WSI as secured in Condition 9 (2) of the Transmission DMLs (Schedules 11 and 12) will contain the detailed project design including the exact position of the export cables, all agreed AEZs and all final mitigation for avoiding these. This will have been agreed with Historic England and submitted to the MMO for approval.

4.2 Features of the HHW SAC and the HHW SAC SIP

25. The key document for agreeing how potential effects of the project on the HHW SAC will be managed is the HHW SAC SIP [an outline of which was submitted at deadline 1; REP1-033]. This is required under Condition 9 (1) (h) of the Transmission DMLs (Schedules 11 and 12). The document will contain the detailed project design including the exact position of the export cables, all agreed *S.spinulosa* reef and areas to be managed as *S.spinulosa* reef and all final mitigation for avoiding these areas where possible.
26. The SIP would be produced in parallel with the final preconstruction WSI and both documents would be submitted to the MMO at approximately the same time.

5 Conclusion

27. In conclusion the offshore cable corridor has been designed to allow sufficient room to microsite export cables to avoid impacts to both Annex 1 *S.spinulosa* reef and features of Archaeological interest. Areas of seabed have been identified where the space available is potentially limited, however even at these locations there is sufficient room to route export cables to avoid all sensitivities.

28. In the unlikely scenario where significantly more features of Archaeological interest are identified and Annex 1 *S.spinulosa* reef has increased to an extent to which it spans the entire 2 to 4.7km width of the offshore cable corridor, routeing will be undertaken to minimise effects as far as possible.