

**RWE Renewables UK Dogger Bank
South (West) Limited**

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South (East) Limited**

**Dogger Bank South Offshore
Wind Farms**

**Project-Level Kittiwake Artificial Nesting
Structure (ANS) Site Selection Report (Revision
2) (Clean)**

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02	13	3.2	Update regarding status of collaboration with Outer Dowsing and Hornsea Four Project.
02	23-28	4.2	GIS figure updates following later stages of site selection work.
02	28	4.2	Additional map (Figure 4-6) added illustrating location of preferred ANS area of search.
02	29	5	Section title update.
02	29	5	Update to details concerning desk-based assessments.
02	30	5	Additional consultees added to list.
02	30	5	Addition of detail regarding the down-selection of some AoS.
02	31-32	5	Presentation of the marine licence area site and rationale driving final stages of selection.
02	33	6	Next steps outlined and update on ground investigation surveys provided.
02	33	6	Update on Marine Licence application timescale.
02	34	6	Confirmation that the Crown Estate's Proximity Check and Asset and External Obligation Proximity Check Process has been completed.

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Acronyms

Acronym	Definition
AONB	Areas of Outstanding Natural Beauty
AoS	Area of Search
ANS	Artificial Nesting Structure
BRAG	Black, Red, Amber, Green
CPT	Cone Penetrometer Tests
DBS	Dogger Bank South offshore wind farms
DCO	Development Consent Order
ETG	Expert Topic Group
KSCP	Kittiwake Strategic Compensation Plan
MPA	Marine Protected Area
MoU	Memorandum of Understanding
ODOW	Outer Dowsing Offshore Wind
OEUK	Offshore Energies UK
OWF	Offshore Wind Farm
SAC	Special Area of Conservation
UK	United Kingdom
UXO	Unexploded Ordnance
ZTV	Zone of Theoretical Visibility

1 Introduction

1.1 Purpose of Document

1. This document sets out the details for the second stage of the Dogger Bank South (DBS) East and DBS West offshore wind farms (hereafter referred to as 'the Projects') project-level site selection work for the location of an offshore kittiwake artificial nesting structure (ANS). This report outlines the process which builds on initial site selection work previously undertaken by the Applicants outlined in **Appendix 1 – Project Level Kittiwake Compensation Plan** [APP-052] which expands upon the plan-level approach provided in the Kittiwake Strategic Compensation Plan (KSCP) (The Crown Estate, 2024) [APP-053].

1.2 Rationale

2. The first stage of site selection work undertaken by the Applicants to identify suitable locations for a project-led offshore ANS was to appraise a longlist of areas of search (AoS) identified by NIRAS and Outer Dowsing Offshore Wind (ODOW) in Appendix D, **Volume 6 KSCP** [APP-053]. One of the primary outcomes of the first stage of site selection work was the exclusion of AoS on the basis that several of those assessed were located in prohibitive water depths for a fixed base structure and / or located in areas of high vessel density (shipping traffic). It was concluded that a shortlist of five AoS would be subject to further investigations to assess site suitability.
3. Following the submission of **Appendix 1 – Project Level Kittiwake Compensation Plan** [APP-052] in June 2024, a review of the shortlisted AoS and data sources was undertaken. It concluded that while the five shortlisted candidate AoS had merit, they remained potentially constrained by physical conditions, soft constraints, as well as technical and logistical challenges, and that the Applicants may have limited options if only these sites were considered. An examination of the wider area of search (English waters of the southern North Sea) suggested that there may have been missed opportunities at locations with good ecological suitability that were not identified previously in **Volume 6, KSCP** [APP-053].

4. As a result, the Applicants have undertaken a second stage of site selection work with the aim of identifying and assessing the suitability of new AoS for the installation of offshore ANS alongside selected AoS presented in Appendix D **Volume 6, KSCP** [App-053]. Prior to additional site selection work being progressed, the Applicants took the opportunity to engage with The Crown Estate and outline plans to identify additional AoS for the delivery of ANS, and no objection was raised. Given the time elapsed since the publication of **Volume 6, KSCP** [App-053], the Applicants have taken the opportunity to utilise updated data sources for hard constraints and integrate additional sources that were not used in the original work by The Crown Estate (2024). The ecological criteria used to identify new potential sites remains unchanged from **Volume 6, KSCP** [APP-053].
5. The Applicants also took the opportunity to incorporate work that was ongoing on installation requirements, methods and logistical matters associated with operation and maintenance of the ANS developed in the post-submission period into the site selection process. Additional work on the design elements of the offshore ANS post-submission led to a more specific understanding of site requirements and an update in assessment criteria for AoS. Though the AoS outlined in **Volume 6, KSCP** [APP-053], have previously been subject to assessment, it was considered prudent to reassess the more favourable of these sites alongside newly identified AoS to reflect updated constraints categories. Updates to the constraints included:
 - The recategorization of the logistical constraints to include distance of AoS from established or planned RWE projects, transit routes and Operations & Maintenance (O&M) ports.
 - An adjustment of optimal and sub-optimal depth categories and revision of maximum depth from 60m to 50m based upon updated engineering advice.
6. In addition to identifying new AoS, the Applicants have also assessed the suitability of repurposing offshore infrastructure due to be decommissioned, including oil and gas platforms, as advised by Natural England in the Dogger Bank South Offshore Wind Farms: Natural England Catch-Up Call 27th July 2024. Following an examination of the decommissioning pipeline, the Applicants assessed the potential of several in situ structures and appraised the suitability of two structures theoretically suitable for repurposing as offshore ANS in greater detail: Garrow gas platform and Scroby Sands OWF. This is discussed further in section 2.

2 Assessment of In-situ Structures

7. Following communication on 27th June 2024, Natural England expressed support for the Applicants engaging with oil and gas operators to identify potential opportunities for cross-sector collaboration in the creation of ANS. Natural England stated that there may be potential to repurpose and / or maintain soon to be decommissioned oil and gas platforms as offshore ANS.
8. To identify potential opportunities for repurposing a suitable offshore structure, the Applicants researched expected timelines for decommissioning of North Sea oil and gas platforms and engaged with Offshore Energies UK (OEUK) to discuss ongoing decommissioning research. A review of the oil & gas decommissioning programme revealed which platforms were to be decommissioned within a suitable timeframe for the Projects. Where potentially suitable platforms were identified, the ecological suitability of the location was assessed, and the asset owners were contacted to discuss the decommissioning programme and the presence or absence of kittiwake on the structures. While a single potentially suitable platform was identified (Garrow gas platform), the owner confirmed that there were no kittiwake present on the structure, making it an unsuitable candidate.
9. The Garrow platform was also discounted on the basis of safety issues associated with repurposing structures at the end of their designed lifespan. Consultation with OEUK and Department for Energy Security and Net Zero (DESNZ) also revealed liability issues associated with repurposing decommissioned structures as ANS. These issues are summarised below:
 - Installations would need to be re-classified and regulated by Offshore Renewable Energy Installations (OREI) / Marine Management Organisation (MMO) under s105 of the Energy Act 2004 and it is questionable whether installations could be re-classified to offshore renewable platforms as defined by the Energy Act 2004, especially in the context of creating bird nesting sites for compensatory measures. For example, the re-purposing is not for the direct purpose of electricity generation.
 - The OSPAR Convention prohibits the dumping or leaving in place of any disused offshore installation in the marine environment. OSPAR Decision 98/3 reaffirms the prohibition and provides the provisions for the competent authority of a Contracting Party to permit a disused offshore installation to be dumped or left in place in the maritime area.
 - Under the OSPAR Convention it is possible for a disused offshore installation to be considered for another purpose, subject to authorisation or regulation by the competent authority. A repurposed offshore installation would therefore no longer be considered as an offshore installation (i.e., oil and gas installation).
 - Platforms identified for decommissioning are usually at or near the end of their design life and there have been concerns raised regarding the safety and integrity

of platforms continuing for another purpose. Previous proposals explored the option of replacing the topsides, but concerns remained on the integrity of the foundation and the liabilities that come with that.

- If an installation was to be re-purposed the offshore installation would still need to be decommissioned and 100% of the decommissioning liabilities would also transfer to the wind farm developer, including the full cost of decommissioning the asset (any tax relief (under the Petroleum Act) will not be applicable).
10. The Applicants also gauged the suitability of another in situ structure with potential to be repurposed as ANS at Scroby Sands offshore wind farm (OWF) ahead of decommissioning. However, the decommissioning timeline did not align with the Applicants' ANS installation requirement and as such this structure was discounted as an option.
 11. On the basis of the above, neither of the in situ offshore assets was considered suitable to take forward in the site selection process.

3 Identifying New Areas of Search

3.1 Data Review

12. Prior to the identification of any new AoS, a full review of data used by NIRAS to identify the AoS on behalf of The Crown Estate in **Volume 6, [APP-053]** was undertaken. All hard constraints were re-evaluated to better understand the nature of infrastructure and activities that were considered to represent areas of the seabed unsuitable for development in previous work.
13. A review was also undertaken to ensure that hard constraints were represented by the most up to date and appropriate data sources. Any new hard constraint data were added to the dataset compiled by NIRAS for **Volume 6, KSCP [APP-053]** to minimise the possibility of overlooked constraints.

3.2 Identification of AoS

14. In alignment with the site selection work undertaken by The Crown Estate (2024), newly identified AoS were primarily limited to areas characterised by medium to high ecological potential, in water depths suitable for the installation of fixed-base ANS. Ecological suitability was assessed by taking account of the 'ecological suitability' score as outlined in **Volume 6, KSCP [APP-053]** which ranged from -1 to 14. Where possible, AoS were located in areas where medium to high (5 to 14) ecological suitability scores represented the majority, if not all of the site. Initial AoS were intentionally large to increase coverage of the seabed to ensure that a range of ground conditions are covered by each site and that there are multiple options for consideration should unsuitable conditions be identified.
15. Building on work outlined in section 9 of the **Appendix 1 – Project Level Kittiwake Compensation Plan (Revision 6) [REP6-010]** and Appendix D of **Volume 6, KSCP [APP-053]**, candidate AoS were also delineated by identifying areas that primarily avoided or minimised interactions with hard constraints and buffers (i.e. were technically deliverable) and had logistical merit.
16. Hard constraints included existing infrastructure or activities and buffers surrounding the areas where the seabed is already occupied and therefore not available, for example oil and gas platforms, cables and pipelines, aggregates, offshore wind farms (OWFs), protected monuments and wrecks, navigational channels, military areas etc. A full list of hard constraints is presented in Appendix D of the **Volume 6, KSCP [APP-053]**. While the same hard constraints were considered as those in **Volume 6, KSCP [APP-053]**, additional datasets were used and updated data sources utilised where possible.

17. In addition to hard and ecological constraints, logistical aspects were also considered when identifying new AoS. Regular monitoring and maintenance of offshore ANS will be required for the duration of the Projects' lifespan. As such, it is important to consider the time, costs, carbon emissions associated with travelling to and from an ANS location for monitoring purposes. It is likely that a structure located in an accessible location will present increased monitoring opportunity and a reduction in monitoring time lost to technical issues associated with remote monitoring in a hostile environment given that equipment repairs can be undertaken more swiftly, resulting in reduce the likelihood of lost monitoring days due to poor weather and sea conditions. Furthermore, ANS sites in accessible locations present a more favourable environmental option, with fewer associated greenhouse gas emissions due to reduced travel times and distances. The distance of potential AoS from existing and future transit routes associated with OWF projects managed by the Applicants as well as preferred operation and maintenance ports and existing project locations were all considered but were not limiting factors when drawing site boundaries.
18. A total of ten new AoS (Sites 1-10) were identified during the second stage of the site selection work and have been progressed for detailed constraints assessment (**Figure 4-1**). These have been assessed along with six sites presented in **Volume 6, KSCP** [APP-053] (of which three offshore AoS previously identified by The Crown Estate (2024) and three AoS previously proposed by ODOW).
19. It is worth noting that one of the AoS (Northwest) overlays the proposed offshore ANS location identified by Hornsea Project Four and while the wider AoS did originally overlie the proposed location being progressed by ODOW in their draft DCO, this section of the AoS was removed so that only the area covering the Hornsea 4 AoS was assessed. While the Applicants plan to deliver kittiwake compensation collaboratively with ODOW, the Applicants do not intend to install the project-led offshore ANS in the same location as that of ODOW.
20. The purpose of including the AoS proposed by ODOW and Ørsted's Hornsea Four Project is to provide information on the potential locations of offshore ANS that could be delivered collaboratively in partnership with the Applicants. The Hornsea Four Project Marine Licence application (MLA/2023/00390) was granted on 23rd October 2024, while provision for a Marine Licence is included within the ODOW draft DCO as a deemed Marine Licence (dML). Geophysical and geotechnical surveys of the final ANS site, and detailed engineering designs have been undertaken by Hornsea Four Project while site investigations, consultation and detailed design work are being progressed for ODOW.

21. Discussions with other developers have included the potential for the Applicants to take on the design and installation works previously undertaken by Hornsea Project Four. Should this be taken forward by the Applicants, it is noted that Hornsea Project Four has progressed the ANS with respect of design, licences and agreements, and has confirmed a willingness to facilitate offshore ANSs where feasible. At the time of writing, it is unlikely that the Applicants will progress with design and installation options originally developed by Hornsea Four due to the advanced nature of project-led offshore ANS package and the finalisation of a Memorandum of Understanding (MoU) with Outer Dowsing. This enables the sharing of reciprocal nesting spaces to provide collaborative compensation, as well as an exchange of design information between both parties.
22. Sites outlined in **Volume 6, KSCP** [APP-053] that were progressed for constraints assessment by the Applicant were selected on the basis of potentially suitable ecological conditions, opportunity around soft constraints (primarily vessel traffic), and physical conditions (suitable water depth).

3.3 Refinement of AoS

23. Following the identification of AoS in areas of seabed that were not prohibited by conflicting hard constraints and suboptimal ecological suitability, where possible, boundaries were reviewed and refined to account for physical site conditions such as extensive areas characterised by suboptimal water depths. As part of the boundary review process, newly identified AoS as well as AoS identified by NIRAS and ODOW during the initial site selection work were adjusted to minimise (where possible) overlaps with constraining factors identified during the earlier site selection work. For example, as shown on **Figure 4-1** the boundary for Site F was cropped to remove an intersection with the North Norfolk Sandbanks and Saturn Reef Special Area of Conservation (SAC) following advice from Natural England.
24. The boundary of Site Northwest was redrawn to exclude the southern half of the area as this is where the ODOW structure is planned to be located (while provision for a Marine Licence is included within the ODOW draft DCO as a deemed Marine Licence (dML)), therefore ensuring that the two ANS are not located too close to each other.

4 Constraints Assessment

4.1 Assessment Approach

25. Following the identification of potentially suitable AoS, a Black, Red, Amber, Green (BRAG) assessment was undertaken to quantify risks associated with both 'hard' and 'soft' constraints within each site, and to determine the potential viability of candidate locations. A total of 16 AoS were subject to investigation, representing a wider geographic spread of sites than in previous site selection work.
26. A list of the AoS progressed for constraints assessment is presented in **Table 4-1**.

Table 4-1 Areas of Search Progressed for Constraints Assessment

AoS	Identified by
Sites 1-10	DBS
Site D	KSCP (proposed by NIRAS / The Crown Estate)
Site E	KSCP (proposed by NIRAS / The Crown Estate)
Site F	KSCP (proposed by NIRAS / The Crown Estate)
East	KSCP (proposed by ODOW)
Southeast	KSCP (proposed by ODOW)
Northwest	KSCP (proposed by ODOW and Hornsea 4)

27. The Applicants have examined the constraints in **Table 4-2** to determine the suitability of the AoS and identify those suitable to take forward for further in-depth specialist studies.

Table 4-2 Constraints Analysed To Refine Long List Of AoS For Offshore ANS

Constraint category	Constraint sub-topic	Data source
Hard constraints	Infrastructure, licenced seabed activities	The Crown Estate (2024a), EMODnet (2023a; 2023b; 2023c), ESCA/ KIS-ORCA (2024), UKHO (2024), Historic England (2024), NSTA (2024)
Biological constraints	Designated Sites (e.g. SACs, SPAs, Marine Conservation Zones and Highly Protected Marine Areas)	Natural England (2023a; 2023b; 2024), JNCC (2021)
	Annex I habitats (e.g. sandbank and reef habitat)	JNCC (2019; 2021)
	Ecological suitability score	NIRAS (2024)
Physical / Engineering constraints	Bathymetry – water depth Bedform	EMODnet (2021)
Logistical constraints	Distance to RWE Projects / transit routes / O&M ports	N/A
Socio-economic constraints	Proximity to Areas of Outstanding Natural Beauty (AONB)	Natural England (2023c)
	Disposal sites	Cefas (2023)
	Dredging sites	EMODnet (2023b)
	Commercial fishing type and intensity	EMODnet (2023d)
	Shipping activity (vessel density)	EMODnet (2019)

28. Following the collation of spatial data sources, a BRAG assessment was undertaken which subjected each of the constraints to scrutiny using a standardised assessment method. The BRAG scoring system (**Table 4-3**) was used to assess the level of constraint for each of the AoS against the hard, biological, physical/engineering, logistical and socio-economic factors outlined in **Table 4-2**. AoS which scored the highest were deemed to be the most favourable based on the constraints examined.

Table 4-3 BRAG Assessment Scoring System.

Risk Category	Score	Score description
HARD, BIOLOGICAL AND SOCIO-ECONOMIC CONSTRAINTS		
Low (green)	2	No significant risk identified. No consenting risks.
Medium (amber)	1	Less favourable option. Some risks identified but there is potential to overcome / mitigate risks with relative ease.
High (red)	0	Significant risks identified. Mitigating / overcoming risks challenging. Least preferred option. Potential for option elimination.
Showstopper (black)	-1	Significant risks identified. Mitigating risks not possible. Option cannot be progressed.
PHYSICAL / ENGINEERING CONSTRAINTS – WATER DEPTH		
Low (green)	2	20-35m
Medium (amber)	1	35-45m
High (red)	0	18-20m, 45-50m
Showstopper (black)	-1	<18m, >50m
LOGISTICAL CONSTRAINTS		
Low (green)	2	Within transit route and buffer (10km)
Medium (amber)	1	<20km
High (red)	0	20km -50km
Showstopper (black)	-1	>50km

29. An initial 'pre-mitigation' BRAG score was given to each constraint for each of the AoS examined. Any mitigation which could be applied to lower any risks identified for each constraint was then considered, following which a second 'post-mitigation' score was given. This allowed for the identification of possible mitigation strategies that could lower the risks associated with the hard, biological, logistical, physical/engineering, and socio-economic constraints. For example, if a proportion of an AoS was characterised in part by high density vessel traffic, then mitigation to avoid areas of high traffic was applied. This would enable the post-mitigation BRAG rating to be reduced (e.g. from 'medium' to 'low') and the score being increased (e.g. from '1' to '2').
30. Following the scoring of individual constraints, the combined score for each constraint category within each site was calculated. The scores for each constraint category for each of the AoS were then ranked and combined which enabled the identification of the most favourable AoS based on the constraints examined.
31. The post-mitigation BRAG scores are presented in **Table 4-4**. The key constraints driving differences between the AoS included designated sites, the presence of Annex I habitats, water depths (bathymetry), distance of AoS from project-related infrastructure / transit routes / O&M ports, commercial fishing and shipping activity. These constraints are shown on **Figure 4-1** to **Figure 4-5**.
32. As shown on **Figure 4-3**, the AoS considered were characterised by water depths ranging from approximately <10m to >100m. An initial assessment of engineering feasibility suggested that industry capability in terms of vessel size, foundation design etc., would likely limit offshore ANS installation to water depths of between 18 – 60m, with shallower water depths (20 – 40m) preferred. This depth range was consulted upon during the kittiwake Expert Topic Group (ETG) in April 2024. However, further engineering assessment has confirmed that installation in water depths greater than 50m is unlikely to be practicable. This depth range was presented to the ETG in September 2024.
33. This information has informed the appraisal of the AoS with respect to water depths with shallower sites (20 – 40m) scoring most favourably. Whilst installation within water depths of 18 – 50m is considered potentially feasible at this stage, further engineering assessment (e.g. of site-specific conditions and the supply chain market) is required to confirm.

34. AoS considered in the BRAG assessment had a wide geographic spread with some sites in accessible locations, and others in isolated areas with fewer reliable access options for maintenance and monitoring vessels. An assessment of the locations of assets owned and planned by the Applicants, established and planned transit routes, and preferred operation and maintenance ports concluded that AoS intersecting or in the vicinity of these features represented more favourable options. ANS sites in accessible locations present a more favourable environmental option, with fewer associated greenhouse gas emissions due to reduced travel times and distances, as well as reduced risk of opportunities being lost. Therefore, AoS within transit routes and buffer (10km) scored most favourably, though sites up to 50km from RWE routes and projects were also considered viable based upon predicted travel times. Given the widespread nature of OWF assets owned by the Applicants within the wider search area, and the number of ports from which project related vessels may mobilise, the categorisation of this constraint was not considered to be an overly limiting factor in the identification of a suitable ANS site.

4.2 Results

35. Following the BRAG assessment, the following AoS were discounted and have not been progressed for further consideration due to constraints present within each site as outlined in detail in **Table 4-4**:
- Sites 1-2, 3, 8-10
 - Site E
 - East
 - Southeast
36. All remaining AoS have been taken forward for further consideration.
37. Sites 1 – 2 and Site E were primarily discounted due to interactions with protected sites designated for sensitive benthic features (North Norfolk and Saturn Reef SAC) (**Figure 4-2**) while Sites 8, 9 and 10 were discounted due to high marine traffic density within site boundaries (**Figure 4-5**). 'East', 'Southeast' and Site 3 were discounted on the basis of low ecological suitability scores and their isolated locations which would make accessing any ANS challenging and time consuming for monitoring and maintenance purposes (**Figure 4-1**), especially in the early years of monitoring when surveys may be as frequent as several times per breeding season.

Table 4-4 Post-Mitigation BRAG Assessment Scores and Descriptions. AoS Ranked in Order of BRAG score. Options Not Progressed Shown in Grey.

AoS	Post-mitigation score	Score description
Site 5	21	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present. Moderate to good ecological suitability score. Limited pockets of optimal depth across AoS; evidence of sandwaves. Low to moderate vessel traffic, low commercial fishing activity. Accessible location for monitoring and maintenance.
Site D	21	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present. Moderate to good ecological suitability score. Limited pockets of optimal depth across AoS; evidence of sandwaves. Low to moderate vessel traffic, low commercial fishing activity. Accessible location for monitoring and maintenance.
Area 3	20	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present. Low - moderate ecological suitability score. Optimal depth across majority of site; no sandwaves. Low to moderate vessel traffic, low commercial fishing activity. Inaccessible location for monitoring and maintenance.
Site 4	20	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present. Moderate ecological suitability score. Small pockets of the AoS optimal depth; no sandwaves. Low to high vessel traffic, low commercial fishing activity. Relatively accessible location for monitoring and maintenance.
Site 6	20	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present. Good ecological suitability score. Parts of site optimal depth; no sandwaves. Moderate to high vessel traffic, low to medium commercial fishing activity. Accessible location for monitoring and maintenance.
Site 7	20	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present. Moderate ecological suitability score. Fairly large areas of suboptimal depth but not a showstopper; no sandwaves. Moderate to high vessel traffic, low commercial fishing activity. Relatively accessible location for monitoring and maintenance.

AoS	Post-mitigation score	Score description
Northwest	19	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present. Moderate ecological suitability score. Location of proposed Hornsea Project 4 ANS. Majority of site optimal depth; no sandwaves. Moderate to high vessel traffic, low commercial fishing activity. Relatively accessible location for monitoring and maintenance.
Site F	19	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present, though reef present to the west. Good ecological suitability score. Optimal depth; no sandwaves. Low to high vessel traffic, moderate to high commercial fishing activity (beam trawling). Relatively accessible location for monitoring and maintenance.
Southeast	19	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitats present. Low ecological suitability score. Optimal water depth; no sandwaves. Moderate to high vessel traffic, low commercial fishing activity. Inaccessible location for monitoring and maintenance.
Site 9	19	Does not overlap with any MPAs designated for benthic features, evidence of Annex I reef within AoS. Moderate ecological suitability score. Optimal depth; no sandwaves. Very high vessel traffic, high commercial fishing activity (beam trawling) in east of site. Relatively accessible location for monitoring and maintenance.
Site 10	19	Does not overlap with any MPAs designated for benthic features, no evidence of Annex I habitat. Moderate ecological suitability score. Majority of site optimal water depth; no sandwaves. Very high vessel traffic, low commercial fishing activity. Relatively close to Suffolk Coast & Heaths Area of Outstanding Natural Beauty (AONB) – likely within zone of theoretical visibility (ZTV). Accessible location for monitoring and maintenance.
Site 8	18	Does not overlap with any MPAs designated for benthic features, evidence of Annex I sandbank within AoS. Moderate ecological suitability score. Majority of site optimal water depth; no sandwaves. Very high vessel traffic, low commercial fishing activity. Relatively inaccessible for monitoring and maintenance.

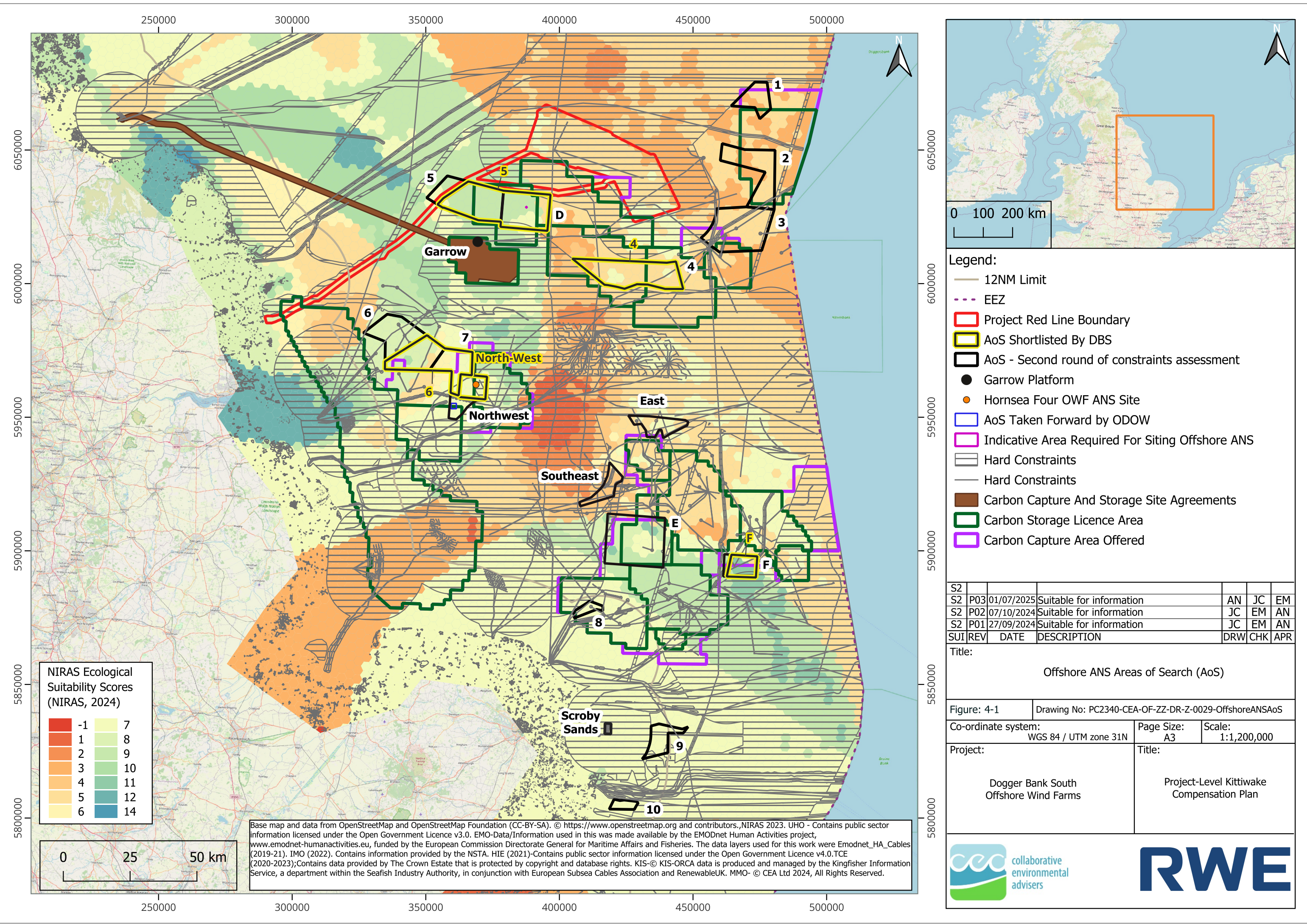
AoS	Post-mitigation score	Score description
East	18	Does not overlap with any MPAs designated for benthic features, no evidence of Annex habitat. Lower ecological suitability score. Optimal water depth; no sandwaves. Low to high vessel traffic, low commercial fishing activity. Inaccessible location for monitoring and maintenance.
Site 1	17	Entirely within Dogger Bank SAC, Annex I sandbank present. Moderate ecological suitability score. Majority of site optimal water depth; no sandwaves present. Low vessel traffic, low commercial fishing activity. Relatively inaccessible location for monitoring and maintenance.
Site 2	17	Entirely within Dogger Bank SAC, Annex I sandbank present. Moderate ecological suitability score. Majority of site optimal water depth; no sandwaves present. Low to high vessel traffic, low commercial fishing activity. Relatively inaccessible location for monitoring and maintenance.
Site E	16	Entirely within North Norfolk Sandbanks and Saturn Reef SAC, Annex I reef present, full extent unknown. Majority of site optimal depth; sandwaves present. Moderate to high vessel traffic, low to high commercial fishing activity (beam trawling). Inaccessible location for monitoring and maintenance.

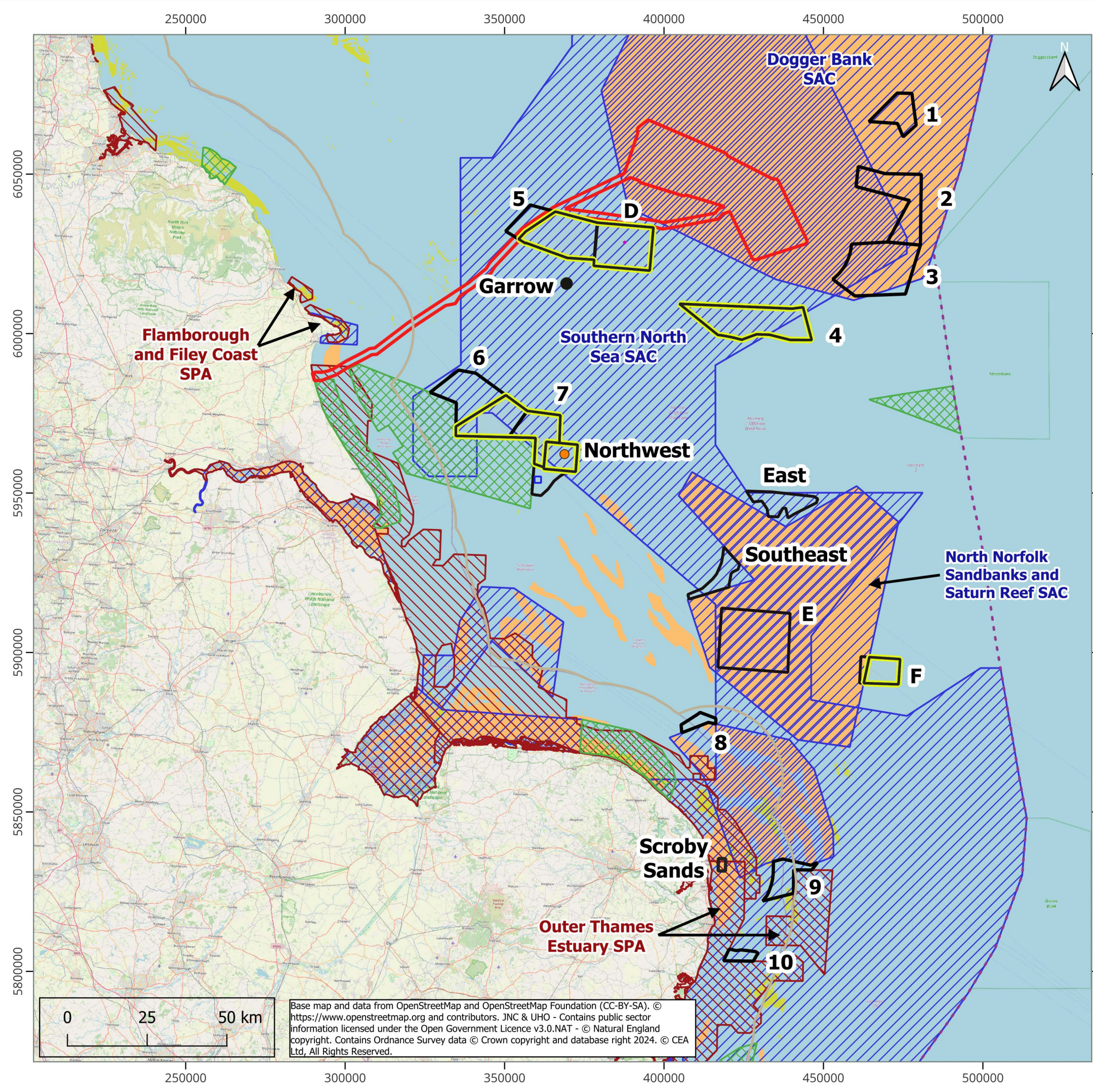
38. The final stage of the analysis was to combine the post-mitigation BRAG scores with the ecological suitability scores generated by NIRAS to determine which areas may be most favourable ecologically. An approximate average ecological suitability score for each of the AoS was derived from the NIRAS GIS layer. The results of this analysis are presented in **Table 4-5**.

Table 4-5 Final Appraisal Scores For Offshore ANS AoS Taken Forward By The Applicants For Further Consideration.

AoS	Post-mitigation BRAG score	Approximate average ecological suitability score	Total Appraisal Score
4	20	5.0	25
5	21	9.0	30
6	21	8.0	28
7	20	7.0	27
D	21	8	29
F	20	9	29
Northwest	20	7	27

39. AoS to be taken forward for the next stage of desk-based investigations represent a combination of sites identified by the Applicants and by NIRAS and ODOW in Appendix D of **Volume 6, KSCP** [App-053]. Each of these is considered to be a viable option based upon work undertaken to date. However, further assessment is required to ascertain the suitability of each of these sites in terms of ground conditions, other sea users, potential hazards and conflicts.





Legend:

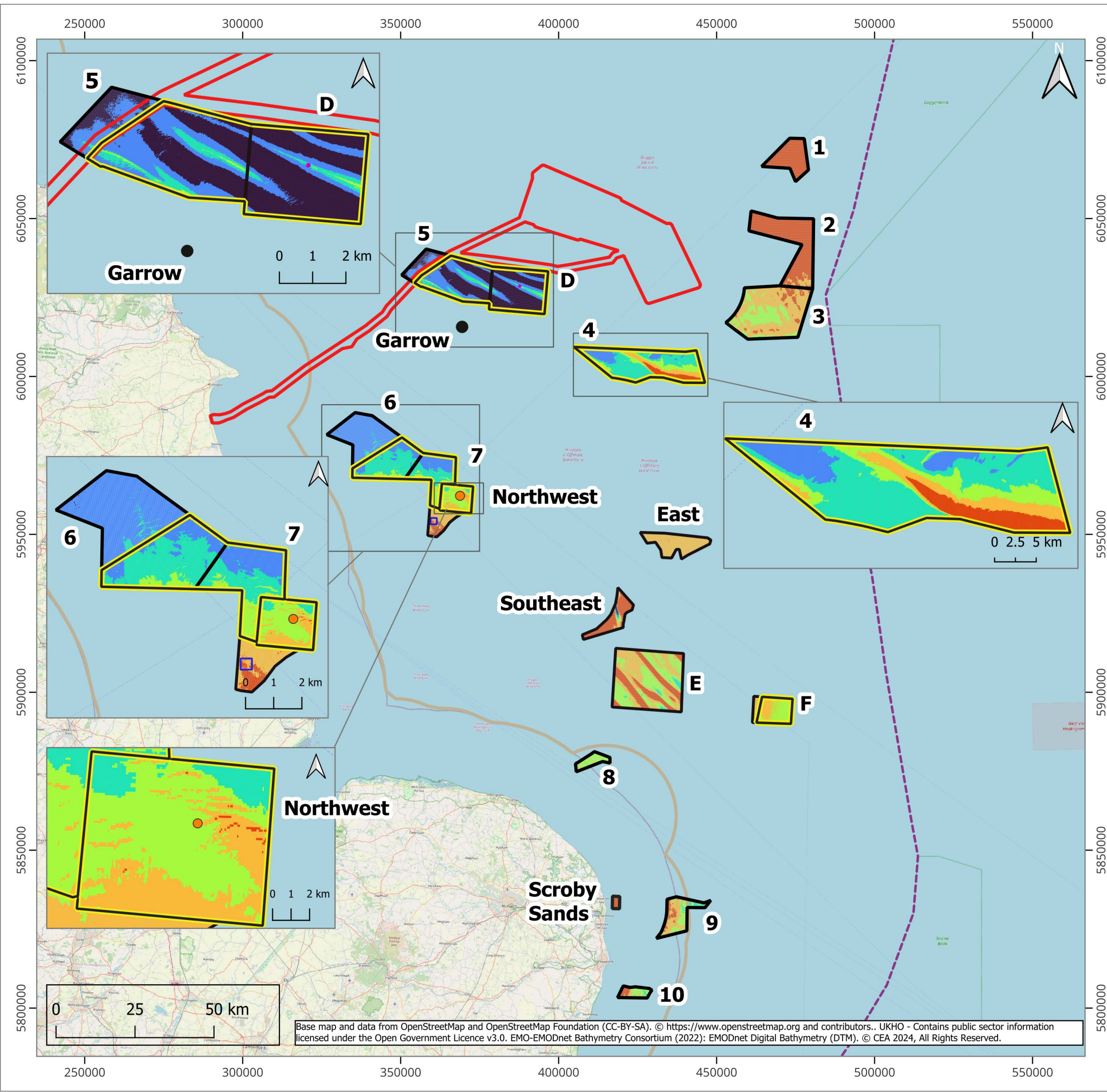
- 12NM Limit
- EEZ
- Project Red Line Boundary
- Shortlisted ANS Areas Of Search
- AoS - Second Round Of Constraints Assessment
- Garrow Platform
- Hornsea Four OWF ANS Site
- Indicative Area Required For Siting Offshore ANS
- AoS Taken Forward by ODO
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Marine Conservation Zone (MCZ)
- Annex I Sandbank
- Annex I Reef

S2	P04				
S2	P03				
S2	P02	07/10/2024	Suitable for information	JC	EM AN
S2	P01	27/09/2024	Suitable for information	JC	EM AN
SUI	REV	DATE	DESCRIPTION	DRW	CHK APR

Title:
Ecological Constraints

Figure: 4-2		Drawing No: PC2340-CEA-OF-ZZ-DR-Z-0020-EcologicalConstraints	
Co-ordinate system: WGS 84 / UTM zone 31N		Page Size: A3	Scale: 1:1,200,000
Project: Dogger Bank South Offshore Wind Farms		Title: Project-Level Kittiwake Compensation Plan	

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0 100 200 km

Legend:

- 12NM Limit
- EEZ
- Project Red Line Boundary
- Shortlisted ANS Areas of Search
- AoS - Second Round Of Constraints Assessment
- Garrow Platform
- Hornsea Four OWF ANS Site
- AoS Taken Forward by ODOW
- Indicative Area Required for Siting Offshore ANS

Bathymetry (m)

- 18 To -20
- 20 To -25
- 25 To -30
- 30 To -35
- 35 To -40
- 40 To -50
- Below -50

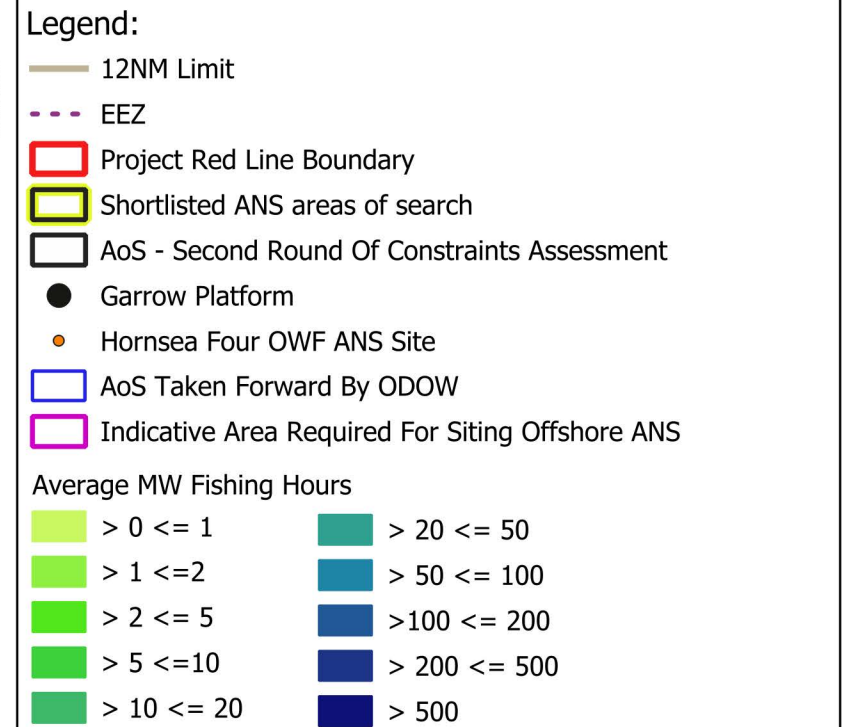
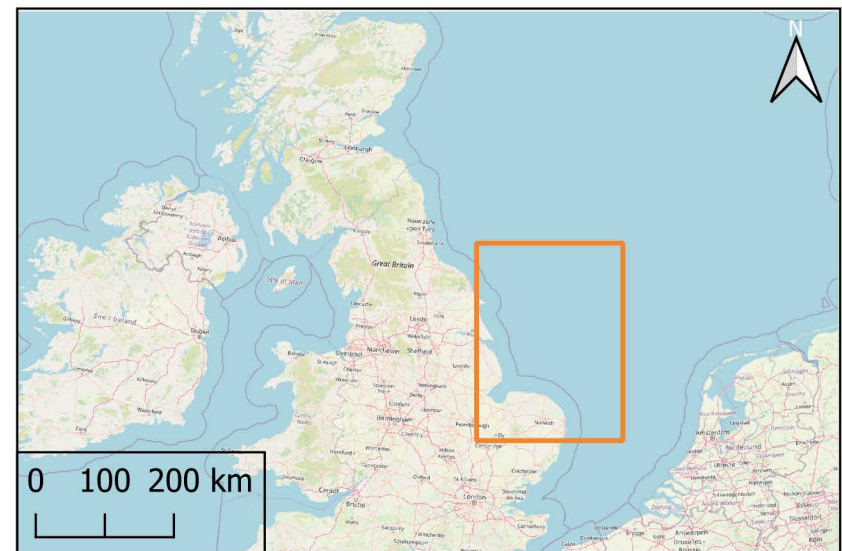
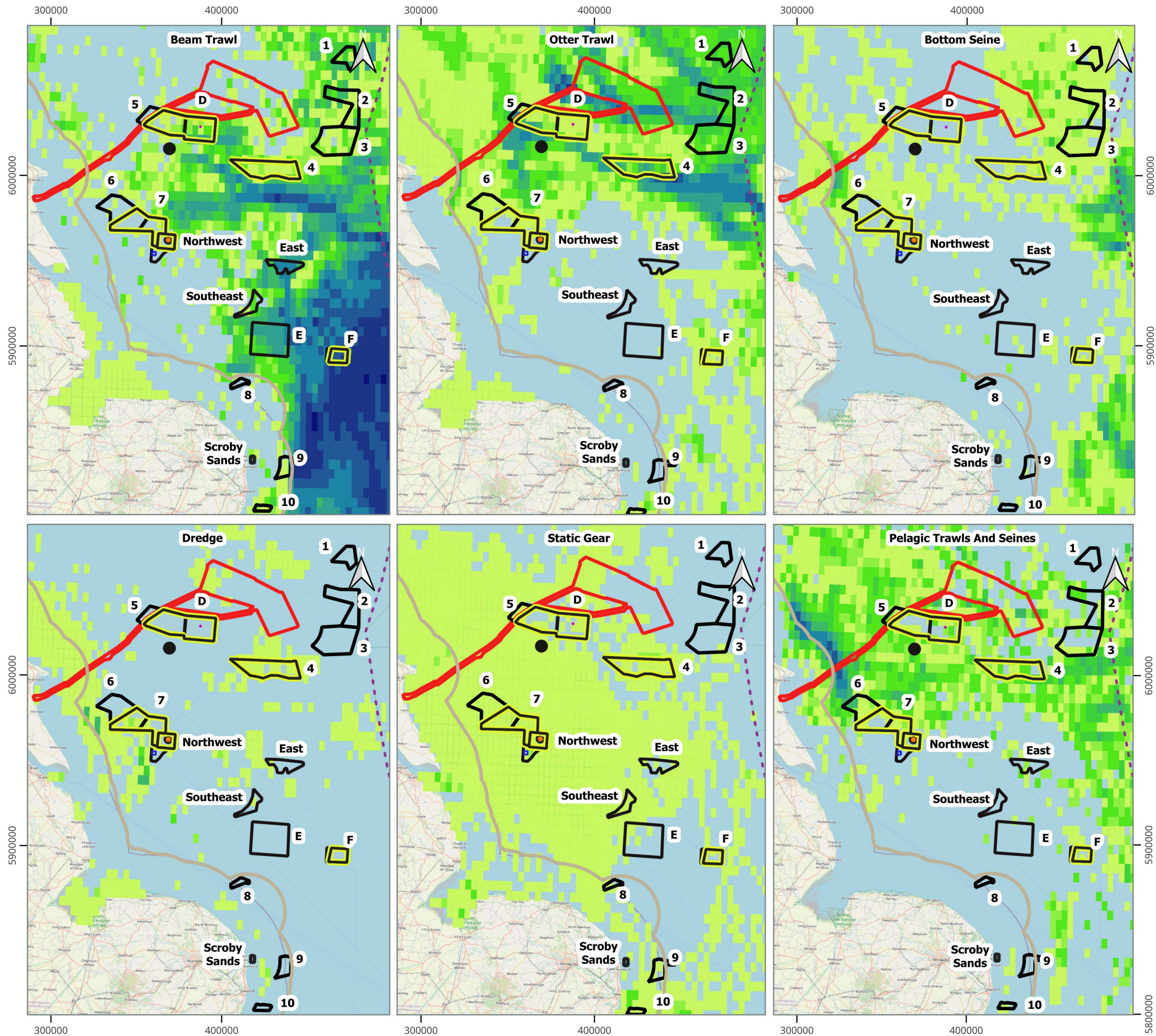
S2	P05				
S2	P04				
S2	P03				
S2	P02	07/10/2024	Suitable for information	JC	EM AN
S2	P01	27/09/2024	Suitable for information	JC	EM AN
SUI	REV	DATE	DESCRIPTION	DRW	CHK APR

Title:

Bathymetry

Figure: 4-3	Drawing No: PB2340-CEA-OF-ZZ-DR-Z-0019-Bathymetry	
Co-ordinate system: WGS 84 / UTM zone 31N	Page Size: A3	Scale: 1:1,200,000
Project: Dogger Bank South Offshore Wind Farms		Title: Project-Level Kittiwake Compensation Plan

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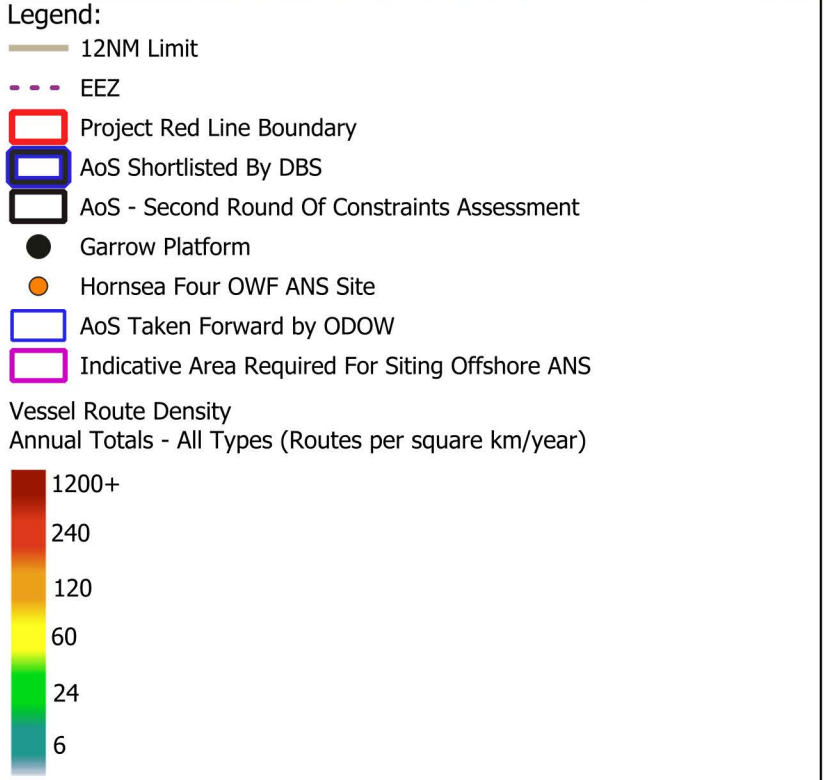
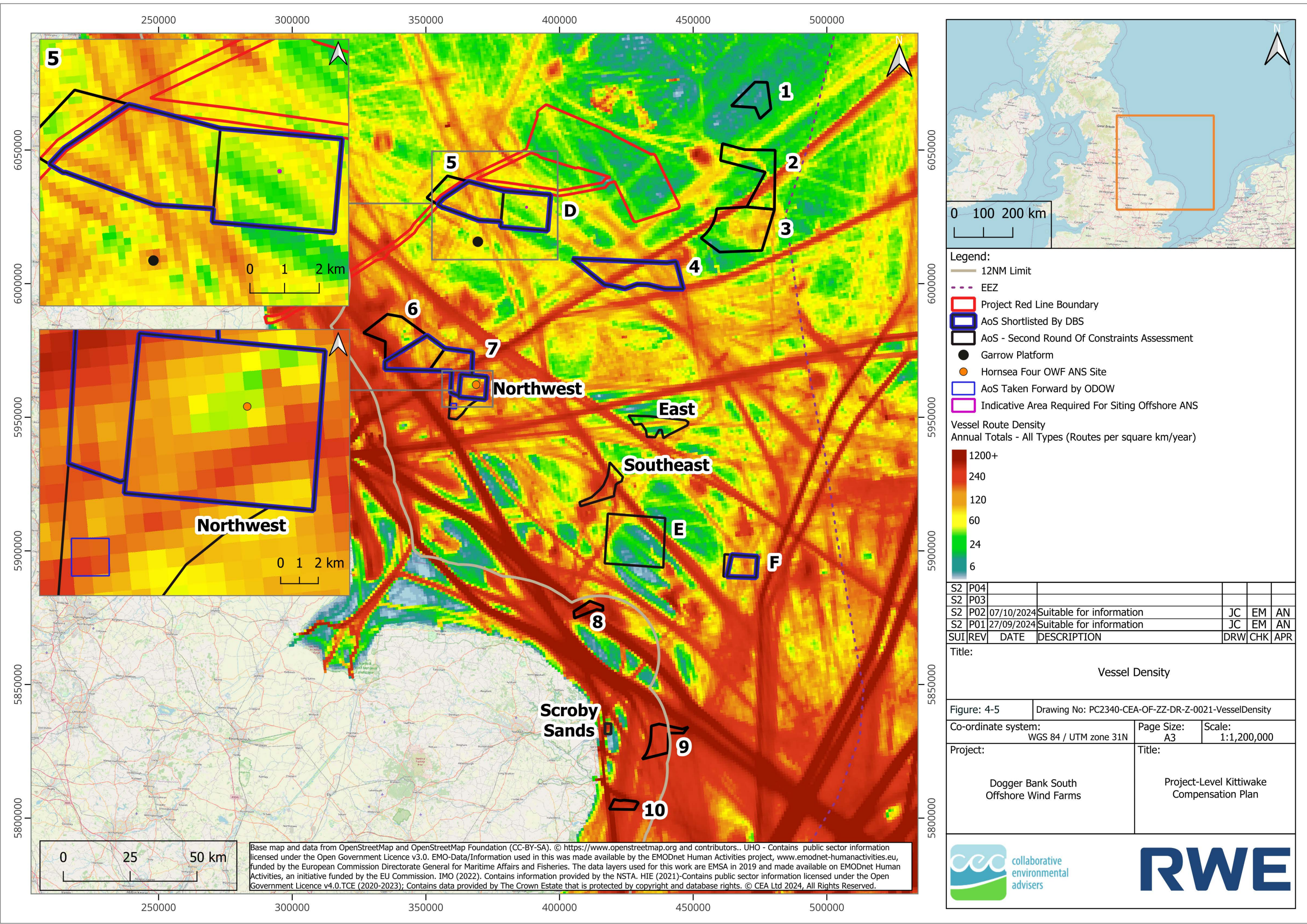


S2	P04				
S2	P03				
S2	P02	07/10/2024	Suitable for information	JC	EM AN
S2	P01	27/09/2024	Suitable for information	JC	EM AN
SUI	REV	DATE	DESCRIPTION	DRW	CHK APR

Title:			
Average Fishing Hours			
Figure: 4-4		Drawing No: PB2340-CEA-OF-ZZ-DR-Z-0022-AvFishingHours	
Co-ordinate system: WGS 84 / UTM zone 31N		Page Size: A3	Scale: 1:2,318,052
Project: Dogger Bank South Offshore Wind Farms		Title: Project-Level Kittiwake Compensation Plan	



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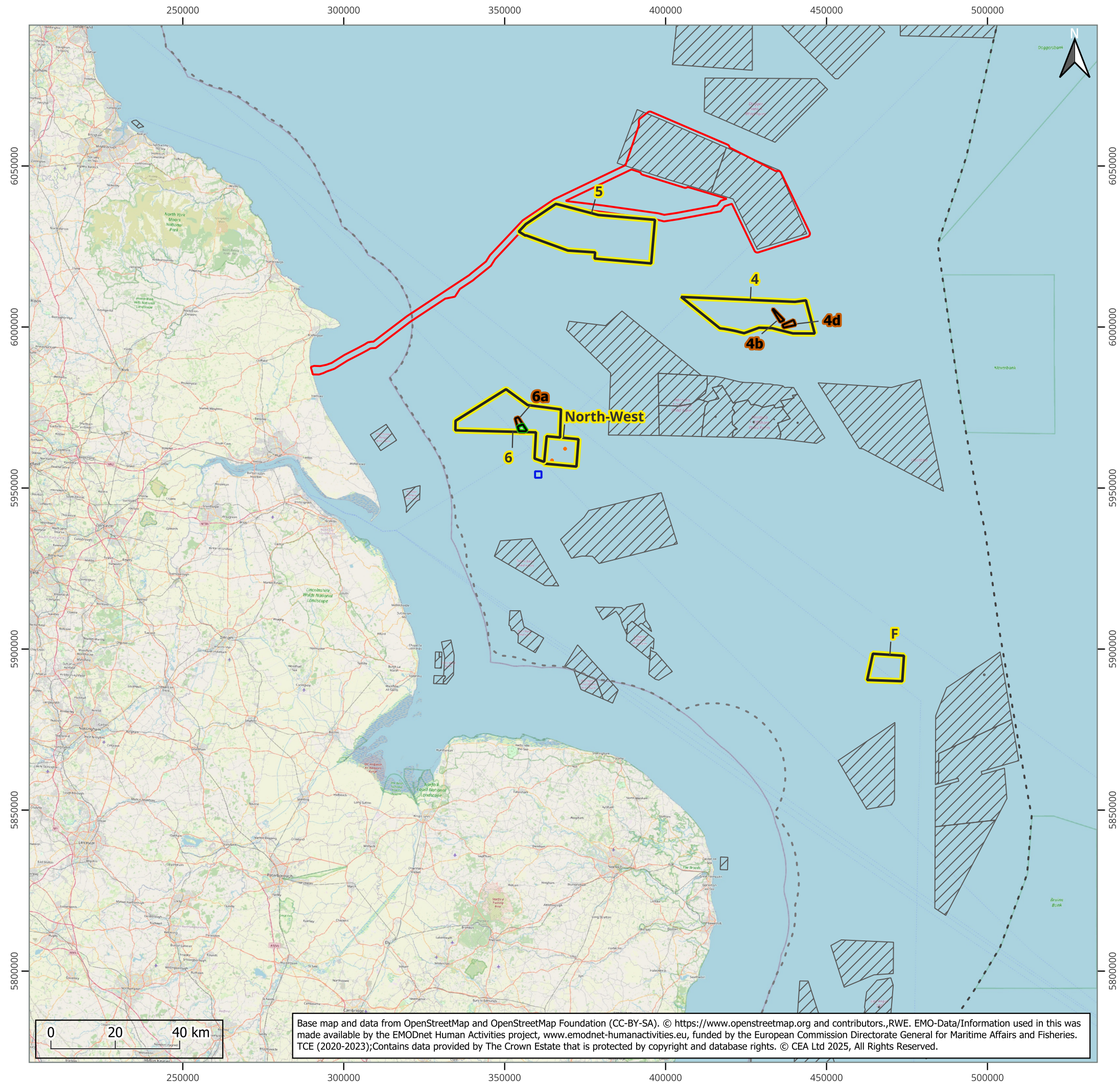


S2	P04					
S2	P03					
S2	P02	07/10/2024	Suitable for information	JC	EM	AN
S2	P01	27/09/2024	Suitable for information	JC	EM	AN
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:			
Vessel Density			
Figure: 4-5		Drawing No: PC2340-CEA-OF-ZZ-DR-Z-0021-VesselDensity	
Co-ordinate system: WGS 84 / UTM zone 31N		Page Size: A3	Scale: 1:1,200,000
Project: Dogger Bank South Offshore Wind Farms		Title: Project-Level Kittiwake Compensation Plan	



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0 150 300 km

Legend:

- Project Red Line Boundary
- Marine Licence Area
- Candidate Sites
- Shortlisted ANS Area of Search
- AoS Taken Forward by ODOV
- Hornsea 4 OWF ANS Sites
- Offshore Wind Site Agreements
- EEZ
- 12NM

S2	P04					
S2	P03					
S2	P02					
S2	P01	01/07/2025	Suitable for information	AN	EM	EP
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:

Figure 4-6: ANS Candidate Sites

Figure: 0019	Drawing No: PC2340-CEA-OF-ZZ-DR-Z-0032-OffshoreANSAoS-P01	
Co-ordinate system: WGS 84 / UTM zone 31N	Page Size: A3	Scale: 1:1,200,000
Project: Dogger Bank South Offshore Wind Farms	Title: Project-Level Kittiwake Compensation Plan	

5 Site Selection Refinement

40. To streamline the desk-based assessments, certain shortlisted AoS have been merged with neighbouring AoS which has resulted in five, rather than seven sites being progressed for desk-based assessments. The final five AoS to be progressed are presented in **Table 5-1**.

Table 5-1 Shortlisted AoS To Be Subject To Further Desk-based Assessments and Component Sites.

Shortlisted AoS subject to desk-based assessment	Component AoS
4	4
5	5 & D
6	6 & 7
F	F
Northwest	Northwest

41. The next stage of the site selection process was to undertake a more detailed technical assessment of certain constraints. This exercise has been undertaken in alignment with the programme outlined in **Table 5-2**.
42. As well as establishing further constraints and stakeholder interactions, desk-based assessments have allowed refinement of the AoS by identifying areas with suitable conditions appropriate for ANS development, and eliminating areas where conditions are unfavourable.
43. Desk-based assessments have included:
- A ground conditions study
 - A shipping and navigation assessment
 - A metocean study
 - Unexploded ordnance (UXO) risk analysis.
44. This next stage of the appraisal process has been undertaken in consultation with key stakeholders including:
- The Crown Estate
 - The Ministry of Defence (MoD)
 - Maritime and Coastguard Agency (MCA)
 - Trinity House

- Oil & Gas operators
 - MMO
 - Historic England
 - Interconnector asset owners
 - Carbon capture storage (CCS) operators; and the
 - National Federation of Fishermen's Organisations (NFFO).
 - Cable operators
45. Following the completion of the shipping and navigation assessment, desk-based ground conditions study, UXO risk assessment and consultation with stakeholders including the Crown Estate, the MCA and Trinity House, the Applicants selected three candidate sites within the two preferred AoS to progress for Site Investigation surveys to confirm the suitability of ground conditions. Of the candidate sites being progressed, two are within Site 4 (4b and 4d) and one is within Site 6 (6a). The locations of the candidate sites are presented in **Figure 4-6**.
46. Site 5, Site F, and Northwest were discounted on the following basis:
47. **Site 5:** This site was excluded on the basis of extremely limited opportunity due to water depth and potentially high risk associated with key navigational routes including those used by commercial ferry operators within the pockets of suitable depth. There were additional concerns relating to engineering constraints that were insurmountable including bedrock expected within the foundation depth, suspected high bed mobility (sandwaves superimposed on sand banks) and the presence of subsurface boulders. This location would also require a long transit from the nearest port if a service vessel were required for operations and maintenance activities - this presents significant environmental (greenhouse gas emissions), HSE and logistical difficulties.
48. **Site F:** This AoS was excluded on the basis of elevated risk associated with the distance from the Projects and associated ports and service vessels. The isolated nature of this location coupled with the distance from safe harbour presents unacceptable risk in relation to HSE concerns. These include elevated transit times to medical assistance, major accident hazard assessment risks in relation to emergency planning for a serious event, and increased risk of illness (sea sickness) and fatigue for personnel requiring access to the ANS for monitoring and maintenance activities. The shipping and navigation risk assessment also identified that there is a potentially unacceptable level of proximity risk on vessels in the east of the site, potentially unacceptable impacts on oil and gas operations associated with the Bessemer gas field and Corvette gas field, the former of which is located within Site F, and potentially unacceptable impacts on the maintenance of subsea pipelines associated with these oil and gas fields. This location would also be associated with elevated greenhouse gas emissions due to increased transit time.

49. **Northwest:** This site was down-selected due to engineering constraints across much of the site which include a highly limited area of drivable ground as well as its proximity to the proposed ANS sites for ODOW and Hornsea 4. The ground conditions in this area presented significant challenges for Hornsea 4 which they could not overcome and put the project at risk. A gravity base would be required for any offshore ANS placed within this location – this would be associated with a significant cost increase for the Projects and would have implications for the design base case adopted by the Applicants to date.
50. The candidate sites which are refined in scale compared to the initial AoS were determined following a process to identify discrete areas within the AoS characterised by low shipping and navigation risk, and suitable ground conditions. These smaller areas were then subjected to further interrogation to assess suitability from a health and safety, operations and maintenance, and engineering perspective. Soft constraints such as ecological suitability were also considered further in the final stages of down-selection, though all locations were considered suitable on the basis of previous assessments.
51. During the later stages of the site selection process, the Applicants continued to engage with the Crown Estate who raised concerns regarding the co-location of an ANS within CCS licence areas CS-006, and CS-007 which overlap the entirety of Site 4. It was initially understood that due to the subsurface nature of the CCS projects being delivered by bp, that the two projects could co-exist, but following engagement with bp and the Crown Estate, it was apparent that progressing any candidate sites within Site 4 would present a significant consenting risk.
52. Following a review of the suitability of candidate sites and advice from the Crown Estate, sites 4b and 4d have been discounted from further consideration.
53. The Applicants marine licence area which will be progressed for offshore ANS delivery is a refined portion of Site 6a. This site is considered to present the lowest risks in terms of consenting, kittiwake collisions potentially related to offshore wind projects, shipping and navigation, health and safety (distance to safe harbour) and accessibility for monitoring and maintenance. Lower risks at Site 6a are balanced with good predicted ecological conditions for kittiwake (including connectivity with FFC SPA and avoidance of highly utilised foraging area for FFC SPA kittiwake), suitable bedform conditions, and optimal water depths. In accordance with principles outlined in **Round 4 KSCP [APP-053]** this location is approximately 61km from the FFC SPA, and between 12.8km and 15.2km from the proposed location of the Outer Dowsing ANS, dependent on the final location of the ANS within the candidate site.

54. The Applicants completed a geophysical survey of Site 6a in May 2025. The outputs of the survey confirmed the presence of suitable conditions for ANS installation in terms of water depth, sediment formation and subsurface rock depth for piling. Data collected during the initial geophysical survey has allowed for further refinement of Site 6a to a 4km² area which will be progressed in the marine licence application. The marine licence area excludes the northern portion of Site 6a, where water depths are greater, and subsurface rock is closer to the seabed surface. The marine licence area includes a >250m buffer around the perimeter of the Holderness Offshore MCZ to avoid any interaction with the protected benthic features within this site during the installation process for the offshore ANS. Refinement of Site 6a to exclude the northern portion of the site also reduces the potential for interaction with fishers given that this is the most utilised area within the candidate site, based on the fishing gear scouting surveys which took place in April 2025.
55. Cone penetrometer tests (CPT) locations were identified from the geophysical data and three CPT locations were surveyed was completed in June 2025. These tests found concluded that piling likely to be achievable within this refined area.
56. The Applicants' proposed marine licence application area within Site 6a was presented to Natural England on 28th May 2025. The selection of Site 6a addresses concerns expressed by Natural England in their response to Examiners Questions on 23rd May 2025 (REP5-062: OR.2.15) where they stated that the proximity of sites 4b and 4d to the Hornsea zone and the Projects may have resulted in increased collision mortality for kittiwakes breeding on ANS in these locations.

6 Next Steps

57. Borehole sampling will be undertaken in Q3 2025. This will provide data at locations identified following a review of geophysical site investigation data. The CPT locations within the marine licence area are located between 13.6km and 17.2km from Outer Dowsing's offshore ANS location, and 12.7km to 14.4km from Hornsea Four's offshore ANS location. It is anticipated that a marine licence application will be submitted to the MMO in July 2025, with a refined area of approximately 4km². The Applicants are continuing to engage with The Crown Estate regarding the details of the Seabed Lease agreement and carrying out ongoing consultation with fisheries organisations and other key stakeholders in the interim.
58. A final location will be selected within the marine licence area for installation following analysis of the borehole and CPT data, and the site characteristics are defined. The final site decision will be made on the basis of suitable ground conditions that will ensure ease of instalment and structural integrity of the ANS as well as avoidance of any sensitive features (including archaeological finds) identified in further geophysical surveys.
59. Additionally, the Applicants continue to take account of new information from other developers (ODOW and Hornsea 4 projects) as it emerges. For example, the DCO application for ODOW at the time of writing is subject to determination by the SoS following their examination. The outcome may influence the onward delivery programme for ODOW and its offshore ANS proposal. These factors have potential implications for the Projects offshore ANS implementation timescales if delivered in collaboration with ODOW.
60. The Proximity Check and Asset and External Obligation Proximity Check Process has been completed by The Crown Estate for the areas covered by the three candidate sites. Following appraisal of the Proximity Checks, the Applicants conclude that none of the agreements triggered within the assessed portfolios represent feasible risks to the implementation of the offshore ANS locations provided to The Crown Estate within Site 6a. However, the Applicants continue to engage with oil and gas operators in the vicinity as courtesy and as a precaution to ensure their understanding of any future risks which may be associated with the development when it is complete. Engagement with The Crown Estate leasing team will continue as the delivery programme progresses. A Letter of Comfort from The Crown Estate on the process for an Agreement for Lease (AfL) for offshore ANS is provided in Appendix A of this report. The Crown Estate Proximity Check documentation is restricted and cannot be shared publicly due to the highly confidential nature of such documents.

61. In addition to the ANS being delivered by the Applicants in the marine licence application area, the Projects have committed to sharing nesting spaces and compensation benefits attached to Outer Dowsing's offshore ANS. The location of this structure is presented on **Figure 4-6**.

Table 6-1 Outline Implementation and Delivery Roadmap for Project-led Offshore ANS.

Timing	Indicative date	Activity/milestone	2024	2025	2026	2027	2028	2029
Pre-consent	2024 (Q1 – Q2)	Development of project-led offshore ANS proposal (including AoS appraisal) following publication of Volume 6, KSCP (application ref: 6.2.1.1) and in consultation with Kittiwake ETG.						
Pre-consent	2024 (Q2)	Projects' DCO application submitted to SoS						
Pre-consent	2024 (Q2) – 2025 (Q1)	Further technical and engineering assessment work undertaken to refine the offshore ANS AoS shortlist. Develop offshore ANS design.						
Pre-consent	2024 (Q4)	Down-selection of shortlisted AoS to final site(s) to be progressed for Site Investigation surveys.						
Pre-consent	2024 (Q2) – 2025 (Q1)	Ongoing stakeholder engagement regarding the design and siting of offshore ANS as well as marine licensing, consents and lease application requirements.						
Pre-consent	2025 (Q1 – Q3)	Secure necessary licences, consents, and seabed lease.						
Year 0	2026 (Q1)	Anticipated DCO consent granted for the Projects						
Year 0	2026-2027	Fabrication of offshore ANS						
Year 0	2027 (Q4)	Installation of offshore ANS.						

Timing	Indicative date	Activity/milestone	2024	2025	2026	2027	2028	2029
Year 1 - 3	2028 - 2029	Kittiwake compensation monitoring – Year 1 & 2						
Year 4	2029 (Q4)	Earliest first power for DBS. Continue compensation and annual monitoring programme as per the Kittiwake CIMP (if required in addition to the KSIMP), and any necessary adaptive management.						

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Appendix A

1 St James's Market
London
SW1Y 4AH

Tel:
Web:



Development Project Manager
RWE Renewables UK Dogger Bank South (East) Limited
RWE UK Dogger Bank South (East) Limited
Windmill Hill Business Park,
Whitehill Way,
Swindon, Wiltshire
SN5 6PB

29th October 2024

By Email Only

RE: Dogger Bank South Offshore Wind Farms Project Habitats Regulations Assessment Compensation Measures

SUBJECT TO CONTRACT

Dear

The Crown Estate Commissioners (referred to in this letter as “we” or “us”) have been approached by RWE Renewables UK Dogger Bank South (West) Ltd and RWE Renewables UK Dogger Bank South (East) Ltd (referred to in this letter as the “Applicants” or “you”) to seek confirmation that, for specific areas of seabed and foreshore, those areas (i) fall within our ownership or (ii) are areas over which we can grant rights, in order to deliver compensation measures identified in the Development Consent Order (“DCO”) application for the Dogger Bank South Offshore Wind Farms Project. This is sought by the Applicants as they must provide sufficient confidence to the Secretary of State that the compensation measures required by the Project are available, securable and deliverable. We are responding on the matter of whether rights are currently available from us. It is for the Applicants, and not The Crown Estate, to demonstrate that they are securable and deliverable.

About The Crown Estate

The Crown Estate’s management powers on the foreshore and within 12 nautical miles

The territorial seabed (which extends to **12 nautical miles** as measured from the baselines established by Order in Council), and around half of the foreshore of, England, Wales and Northern Ireland belong to the Crown. Such territorial seabed and foreshore falls under the management of The Crown Estate by virtue of the Crown Estate Act 1961. As a result, subject to certain exclusions, TCE manages the grant of interests within the same, in much the same way as TCE manages on-shore assets, where such land/interests vest in TCE on behalf of the Crown.

The Crown Estate’s management powers outside 12 nautical miles up to the outer limit of the “Renewable Energy Zone”

Beyond the territorial waters, by virtue of the Energy Act 2004 and secondary legislation, **within the area known as the “Renewable Energy Zone” (or the “REZ”)**, the right to exploit the

Renewable Energy Zone for the production of energy from water or winds or for other purposes connected with such exploitation belongs to the Crown. These rights are for TCE to manage on behalf of the Crown (pursuant to the Crown Estate Act 1961 (as supported by other sources)) in relation to the REZ adjacent to England, Wales and Northern Ireland.

About Dogger Bank South Offshore Wind Farms Project

We understand that The Dogger Bank South Offshore Wind Farms project comprises the two offshore wind farms (Dogger Bank South West and Dogger Bank South East), and associated offshore and onshore infrastructure including offshore and onshore high voltage electricity cables, onshore and offshore electricity substation(s), connection(s) to the National Grid and ancillary and temporary works. Compensation has been concluded to be required in relation to certain effects of its development in-combination with other projects and we understand that the Applicants are considering a number of measures including Offshore Artificial Nesting Structure(s).

Dogger Bank South Offshore Wind Farms Project Habitats Regulations Assessment Offshore Artificial Nesting Structures ("Offshore ANS")

We understand that:

- (a) For kittiwake (*Rissa tridactyla*) from the Flamborough and Filey Coast Special Protection Area (FFC SPA), the Applicants' Volume 6, Report to Inform Appropriate Assessment (RIAA) (application ref: 6.1) concludes that Adverse Effects On Integrity (AEol) cannot be ruled out as a result of predicted collision mortality, when considered in-combination with other offshore wind farms (OWFs). This conclusion is consistent with the outcome of The Crown Estate's Plan Level Habitats Regulations Assessment.
- (b) The Applicants have put forward, as part of their consent application, measures to compensate for the predicted impacts of the Projects, which are described in this Project-Level Kittiwake Compensation Plan. This document forms part of the Applicants' overarching Volume 6, Habitats Regulations Derogation: Provision of Evidence (application ref: 6.2).
- (c) the use of Offshore ANS forms the primary compensation measure for kittiwakes. The Applicant is therefore considering constructing an Offshore ANS **within the REZ** to provide additional nesting space for relevant bird species and to encourage formation of new offshore colonies.

The Crown Estate confirms that, as at the date of this letter, we have the ability to grant the rights which we would anticipate being required in respect of the construction of the proposed Offshore ANS site(s) **within the REZ**, where:

- (a) the grant of such rights would not be inconsistent with existing third-party rights and/or interests in the Offshore ANS site(s); and

- (b) the construction of the Offshore ANS site(s) does not interfere with public rights, save to the extent permitted by law (which, where applicable, may be by the grant of relevant consents and/or permissions from, and/or the adoption of measures by, the relevant authorities),

and such grant would be subject to:

- (c) securing appropriate proximity checks results as regards the rights of others;
- (d) the Applicants having obtained all necessary consents and/or permissions from the relevant authorities (and compliance with all relevant legislation); and
- (e) contract and commercial agreement.

The Crown Estate Summary Position Statement

It is understood that the Applicants would secure the necessary consents to deliver the compensation measures, and that the implementation of the compensation measures would be conducted in accordance with the relevant compensation plan and post-consent Compensation Implementation and Monitoring Plan (CIMP) document. Furthermore, the compensation measures would follow established standards and best practice guidelines and would be conducted in close collaboration with stakeholders and restoration experts.

The position of The Crown Estate, as to the availability of the relevant interests and/or rights from us, is as set out above. For the avoidance of doubt:

1. we are not yet in a position to enter into any legal documentation with the Applicants but the Applicants has requested this letter of comfort as an interim measure to assist with the DCO process;
2. subject to the above-mentioned matters and subject to contract, we can confirm that it is our current intention to continue to work with the Applicants in good faith to assist the Applicants in finding appropriate areas in which compensations measures can be facilitated within the necessary timescales;
3. this letter is intended to be a statement of The Crown Estate's present intention only and accordingly shall not be construed as constituting a promise or warranty as to future conduct; and
4. nothing expressed or implied in this letter is intended to create legal relations between The Crown Estate, the Applicants and/or any third party. In addition, this letter does not constitute any variation to the terms of any of the Project's documents nor shall it be treated as the provision of consent.

Yours sincerely



Head of Nature & Environment (Marine)

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