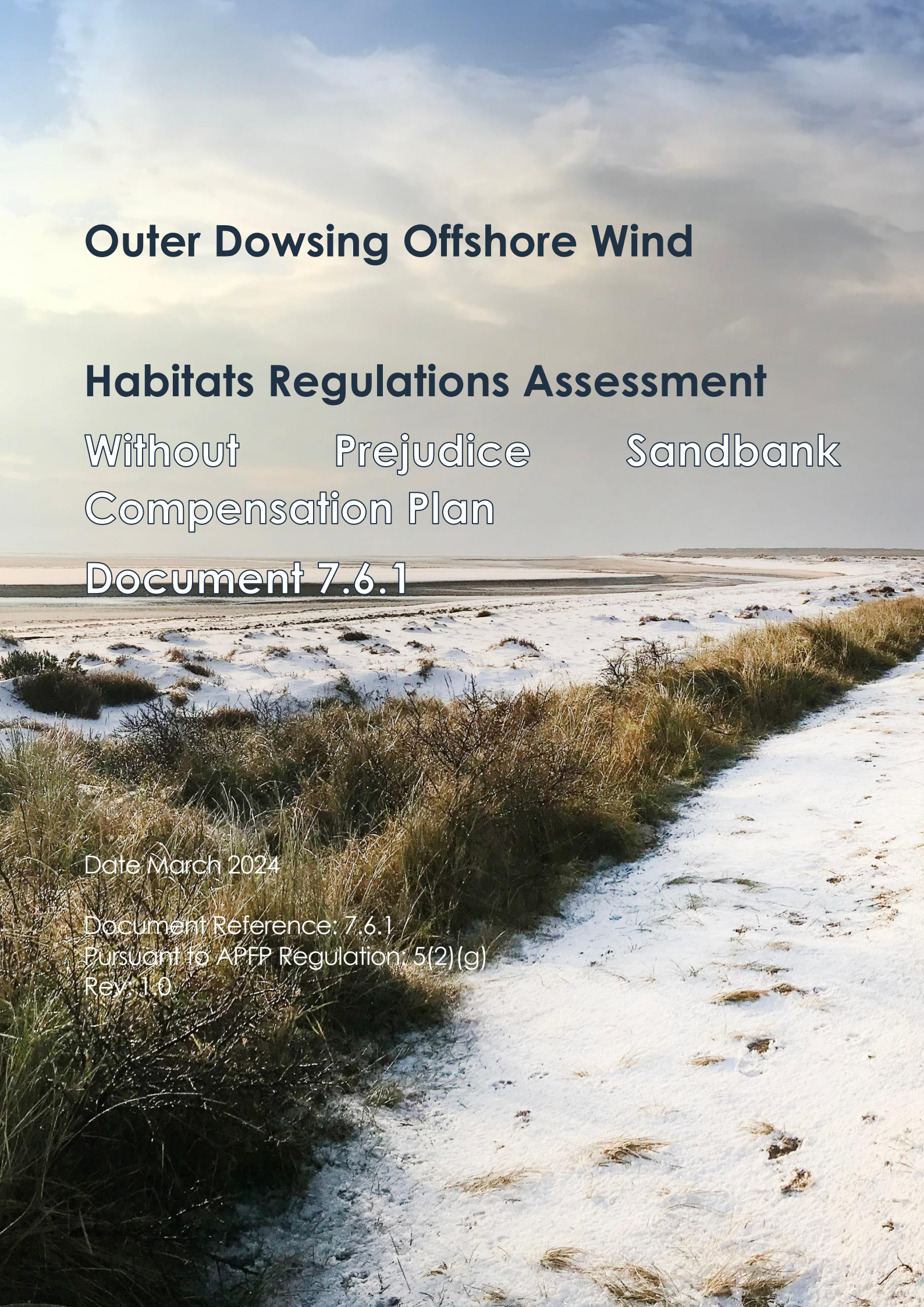


Outer Dowsing Offshore Wind

Habitats Regulations Assessment

Without Prejudice Sandbank Compensation Plan

Document 7.6.1

Date March 2024

Document Reference: 7.6.1
Pursuant to APFP Regulation: 5(2)(g)
Rev: 1.0

Company:	**Outer Dowsing Offshore Wind**	Asset:	**Whole Asset**
Project:	**Whole Wind Farm**	Sub Project/Package:	Whole Asset
Document Title or Description:	Without Prejudice Sandbank Compensation Plan		
Internal Document Number:	PP1-ODOW-DEV-CS-PLA-0029	3rd Party Doc No (If applicable):	N/A

Outer Dowsing Offshore Wind accepts no liability for the accuracy or completeness of the information in this document nor for any loss or damage arising from the use of such information.

Rev No.	Date	Status / Reason for Issue	Author	Checked by	Reviewed by	Approved by
V1.0	March 2024	DCO Application	GoBe	Outer Dowsing	Shepherd and Wedderburn	Outer Dowsing

Table of Contents

Table of Tables

Table of Figures

Acronyms & Definitions

Abbreviations / Acronyms

Abbreviation / Acronym	Description
AEoI	Adverse Effect on Integrity
ANS	Artificial Nesting Structures
BESS	British Energy Security Strategy
CBRA	Cable Burial Risk Assessment
Cefas	Centre for Fisheries, Environment and Aquaculture Science
CIEEM	Chartered Institute of Ecology and Environmental Management
COWSC	Collaboration on Offshore Wind Strategic Compensation
DEP	Dudgeon Extension Project
DESNZ	Department for Energy Security and Net Zero (formerly Department of Business, Energy and Industrial Strategy (BEIS))
DCO	Development Consent Order
DO	Dissolved Oxygen
EC	European Commission
ECC	Export Cable Corridor
EOD	Explosive Ordnance Disposal
EPP	Evidence Plan Process
ES	Environmental Statement
ETG	Expert Technical Group
HHW	Haisborough, Hammond and Winterton
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IDRBNR	Inner Dowsing, Race Bank and North Ridge
IFCA	Inshore Fisheries and Conservation Authority
JNCC	Joint Nature Conservation Committee
LWT	Lincolnshire Wildlife Trust
MBES	Multibeam echosounder
MCZ	Marine Conservation Zone
MMO	Marine Management Organisation
MPA	Marine Protected Area
MRF	Marine Recovery Fund
NFFO	National Federation of Fishing Organisations
ORCP	Offshore Reactive Compensation Platform
OWEIP	Offshore Wind Environmental Improvement Package
OWF	Offshore Windfarm
RAG	Red-Amber-Green
RIAA	Report to Inform Appropriate Assessment
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SBP	Sub-bottom Profiler
SEP	Sheringham Shoal Extension Project
SCSG	Sandbank Compensation Steering Group
SCIMP	Sandbank Compensation Implementation and Monitoring Plan

Abbreviation / Acronym	Description
SNCB	Statutory Nature Conservation Bodies
SoS	Secretary of State
SSS	Side Scan Sonar
UXO	Unexploded Ordnance

Terminology

Term	Definition
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, TotalEnergies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
Array area	The area offshore within which the generating stations (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling are positioned.
Cable Circuit	A number of electrical conductors necessary to transmit electricity between two points bundled as one cable or taking the form of separate cables, and may include one or more auxiliary cables (normally fibre optic cables).
Cable ducts	A duct is a length of underground piping which is used to house the Cable Circuits.
Compensatory Measures	Stage 3 of the Habitats Regulations Assessments (see Derogation) involves the development of compensation measures for any features which the report to inform appropriate assessment was unable to conclude no adverse effect on integrity on.
deemed Marine Licence (dML)	A marine licence set out in a Schedule to the Development Consent Order and deemed to have been granted under Part 4 (marine licensing) of the Marine and Coastal Access Act 2009.
Derogation	Stage 3 of the Habitats Regulations Assessments which is triggered once it is determined that you cannot avoid adversely affecting the integrity of a designated site. Involves assessing if alternative solutions are available to achieve the same goals as the project, if there are imperative reasons of overriding public interest, and if compensatory measures will be required.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP) from the Secretary of State (SoS) for Department for Energy Security and Net Zero (DESNZ).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of an impact with the sensitivity of a receptor, in accordance with defined significance criteria.

Term	Definition
Export cables	High voltage cables which transmit power from the Offshore Substations (OSS) to the Onshore Substation (OnSS) via an Offshore Reactive Compensation Platform (ORCP) if required, which may include one or more auxiliary cables (normally fibre optic cables).
Habitats Regulations Assessment (HRA)	A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI) and compensatory measures.
Maximum Design Scenario	The maximum design parameters of the combined project assets that result in the greatest potential for change in relation to each impact assessed.
Mitigation	Mitigation measures, or commitments, are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
Offshore Export Cable Corridor (ECC)	The Offshore Export Cable Corridor (Offshore ECC) is the area within the Order Limits within which the export cables running from the array to landfall will be situated.
Offshore Reactive Compensation Station (ORCP)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents) housing electrical reactors and switchgear for the purpose of the efficient transfer of power in the course of HVAC transmission by providing reactive compensation
Offshore Substation (OSS)	A structure attached to the seabed by means of a foundation, with one or more decks and a helicopter platform (including bird deterrents), containing— (a) electrical equipment required to switch, transform, convert electricity generated at the wind turbine generators to a higher voltage and provide reactive power compensation; and (b) housing accommodation, storage, workshop auxiliary equipment, radar and facilities for operating, maintaining and controlling the substation or wind turbine generators
Outer Dowsing Offshore Wind (ODOW)	The Project.
Order Limits	The area subject to the application for development consent, the limits shown on the works plans within which the Project may be carried out.
Pre-construction and post-construction	The phases of the Project before and after construction takes place.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.

Term	Definition
Project Design envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.
Receptor	A distinct part of the environment on which effects could occur and can be the subject of specific assessments. Examples of receptors include species (or groups) of animals or plants, people (often categorised further such as 'residential' or those using areas for amenity or recreation), watercourses etc.
Strategic Compensation	Collaborative approach by developers and/or government departments to secure compensation for adverse effects on the conservation objectives of a protected marine area, where the scale of offshore wind delivery is likely to exceed the ability of developers to provide sufficient compensation on an individual project specific basis.
Study Area	Area(s) within which environmental impact may occur – to be defined on a receptor-by-receptor basis by the relevant technical specialist.
Subsea	Subsea comprises everything existing or occurring below the surface of the sea.
Wind turbine generator (WTG)	A structure comprising a tower, rotor with three blades connected at the hub, nacelle and ancillary electrical and other equipment which may include J-tube(s), transition piece, access and rest platforms, access ladders, boat access systems, corrosion protection systems, fenders and maintenance equipment, helicopter landing facilities and other associated equipment, fixed to a foundation

Reference Documentation

Document Number	Title
6.1.3	Project Description
6.3.3.1	Confidential Cable Burial Risk Assessment
6.1.4	Site Selection and Consideration of Alternatives
6.1.7	Marine Physical Processes
6.3.7.3	Confidential Sediment Mobility Study
6.1.9	Benthic Subtidal and Intertidal Ecology
6.1.10	Fish and Shellfish Ecology
7.1	Report to Inform Appropriate Assessment
7.5	Derogation Case
7.6	Without Prejudice Benthic Compensation Strategy
7.6.1.1	Sandbank Compensation Implementation and Monitoring Plan
7.6.3	Benthic Compensation Evidence Base and Roadmap
8.22	Outline Biogenic Reef Mitigation Plan

1 Introduction

1. GT R4 Limited (trading as Outer Dowsing Offshore Wind) hereafter referred to as the 'Applicant' is proposing to develop Outer Dowsing Offshore Wind (the Project), which will be located approximately 54km offshore from the Lincolnshire coastline in the southern North Sea. The Project will include both offshore and onshore infrastructure including an offshore generating station (windfarm), export cables to landfall, Offshore Reactive Compensation Platforms (ORCPs), onshore cables, connection to the electricity transmission network, ancillary and associated development and areas for the delivery of up to two Artificial Nesting Structures (ANS) and the creation of a biogenic reef (if these compensation measures are deemed to be required by the Secretary of State (SoS)) (see Volume 1, Chapter 3: Project Description for full details).
2. The Offshore Export Cable Corridor (ECC) will run from the array area to landfall at Wolla Bank on the Lincolnshire coast, and the total export cable length is expected to be 514.8km (for up to four cables). The Offshore ECC has been developed through extensive route selection and evaluation work, taking into consideration environmental and engineering constraints (as presented within Chapter 4: Site Selection and Alternatives (document reference 6.1.4) of the Environmental Statement (ES)). The final route passes through the Inner Dowsing, Race Bank, and North Ridge (IDRBNR) Special Area of Conservation (SAC). The Offshore ECC overlaps with 70.1km^2 of the SAC (8.3% of the total SAC).
3. As part of the Project development process, detailed engineering evaluation of the section of the Offshore ECC has been undertaken prior to the submission of a Development Consent Order (DCO), including collection and assessment of:
   - Site specific geophysical data (including multibeam echosounder (MBES), side scan sonar (SSS), and sub-bottom profiler (SBP) data);
   - Site specific shallow geotechnical samples (gravity cores and cone-penetration test); and
   - Site specific grab samples to provide information on surface sediments.
4. These data have been used to inform early-stage assessments of both the likelihood of cable burial success using multiple cable installation tools, and the risk of exposure over the lifetime of the Project. Specifically, a detailed seabed mobility study has been undertaken, which provides critical information as to the required burial depths needed to avoid cable exposures, which has then been used to inform an assessment of the likelihood of cable burial success using the tools currently available on the market.
5. Full details of the proposed project parameters and the specific engineering works to inform the cable installation through the sandbanks (and wider IDRBNR SAC) are presented within the Project Description chapter of the ES (Chapter 3; document reference 6.1.3).

1.1 Predicted Effects

6. Within the Report to Inform an Appropriate Assessment (RIAA; document reference 7.1), the Applicant has concluded that an adverse effect on integrity (AEoI) to the IDRBNR SAC from the construction, operation and decommissioning of the Project can be ruled out, when considering the detailed project design and associated mitigations which have been committed to (Section 2).
7. Notwithstanding the confidence the Applicant maintains in the conclusions of no AEoI, the Applicant is cognisant of conclusions drawn by the SoS on previous offshore windfarm (OWF) developments (such as Hornsea Three and the Norfolk Vanguard and Boreas projects) with regard to the potential for an AEoI not being able to be ruled out to SACs with the same features as the IDRBNR SAC, specifically Annex I 'Sandbanks covered by seawater at all times', arising from the deployment of rock protection.
8. Therefore, whilst the Applicant is confident that a conclusion of no AEoI can be reached for the Project, in acknowledgement of the previous decisions and taking account of the advice provided by Natural England as to the risk of an AEoI for this site and the relevant features, a 'without prejudice' derogation case has been developed for Annex I sandbank feature of this site.

1.2 Purpose

9. This plan sets out how the compensation measures for impacts within the IDRBNR SAC on Annex 1 Sandbank can be secured at the time of the DCO being granted (should the SoS determine that compensation is required). The plan provides a suite of measures, including potential strategic measures and also resilience measures. At this stage is it important to note that the site selection, detailed design and monitoring of the proposed measures will be developed in consultation relevant stakeholders.
10. A compensation implementation and monitoring plan to deliver any required compensation for this feature will be prepared based on the strategy set out in the final version of this Plan, as secured in Schedule 22 of the Development Consent Order.

1.3 Compensation Measures

11. To allow for sufficient time to engage with stakeholders and develop robust 'without prejudice' compensation plans and supporting evidence, the Applicant investigated the feasibility of compensation options during the pre-application period. It should be noted that these workstreams are not intended to prejudice the outcome of the Habitats Regulations Assessment (HRA) process.
12. In the event that the SoS is unable to reach a conclusion of no adverse effect on the integrity of the IDRBNR SAC, the Applicant has developed 'without prejudice' compensation measures that can be applied (by the SoS) to compensate at scalable levels for the impacts caused by the Project.

13. This document details the potential compensation options to support the 'without prejudice' derogation case in relation to:

    - Potential loss of sandbanks slightly covered by sea water all the time (hereafter referred to as 'sandbanks') at IDRBNR SAC resulting from the installation of cable protection material on the offshore export cables in those parts of the SAC where they cross the designated sandbank features.

14. As part of the process of developing the 'without prejudice' derogation case, the Applicant has developed a shortlist of possible compensation options based on the existing Project proposal, recent DCO decisions that have been consented on the basis of an HRA derogation, and stakeholder feedback received to date. These shortlisted options were narrowed down from a longlist following a ranking criteria assessment (otherwise known as a Red-Amber-Green (RAG) assessment) and were discussed in the Compensation Measures Ranking Approach Note (ODOW, 2023).

15. The Applicant notes that under European Commission (EC) guidance (European Commission, 2018), the compensation should normally be in place before the effect on the designated feature takes place; however, it acknowledges that there may be situations where it will not be possible to meet this condition. The guidance states that *"best efforts should be made to ensure that compensation is in place beforehand, and, in the case that this is not fully achievable, the competent authorities should consider extra compensation for the interim losses that would occur in the meantime"*. As such, the short-listing approach has considered the feasibility of the implementation of the potential compensation measures as part of the evaluation of the different measures, alongside other aspects recommended by Natural England in the identification and selection of compensation measures.

16. The Project has proposed compensation for the potential loss of sandbanks. The measures below are proposed on a 'without prejudice' basis.

    - SAC extension
        - Alternative protection methodologies
    - Creation of biogenic reef
    - Anthropogenic pressure removal
        - Redundant infrastructure removal
        - Aggregate pressure removal
        - Marine debris removal/ awareness
    - Seagrass bed habitat creation/restoration.

1.4 Stakeholder Engagement

17. The Applicant has undertaken extensive consultation with the relevant stakeholders (namely, Natural England, , Marine Management Organisation (MMO), the Planning Inspectorate, The Crown Estate, the Wildlife Trusts, Defra, the National Federation of Fisherman's Organisations (NFFO) and relevant Inshore Fisheries and Conservation Authorities (IFCAs)).
18. The Applicant recognised the potential need to develop without prejudice compensatory measures for impacts arising from the Project from an early stage of the development. Consequently, at the outset of the Evidence Plan Process (EPP), an Expert Technical Group (ETG) was developed to cover derogation and compensation matters (addressing both benthic and ornithological receptors). This ETG was later split out to enable topic specific compensation discussions to progress within the topic specific ETGs, with benthic compensation considered within the Marine Ecology and Marine Processes ETG. The ETG members were consulted on the longlist and the shortlist of compensation options throughout their development. The ETG members are Natural England, the MMO (with their advisors from the Centre for Fisheries, Environment and Aquaculture Science (Cefas)), and Lincolnshire Wildlife Trust (LWT).
19. Latest feedback on the Benthic Compensation Short-List received from the ETG members and Defra is summarised in Table 1.1.
20. Following consultation with the ETG, each of the shortlisted compensation options have been further explored and developed within this document.
21. The engagement through the Projects Evidence Plan Process and bilateral consultation is detailed in Technical Consultation Report (document reference 6.1.6).
22. If the SoS determines that compensation is required, following the DCO being made, the Project will engage with relevant stakeholders, which would include the establishment of a Sandbank Compensation Steering Group (SCSG), to work collaboratively in the development of a Sandbank Implementation and Monitoring Plan (SIMP) for the chosen compensation option.

Table 1.1 Consultation responses from the benthic compensation Discretionary Advice Service (DAS) [1]

Consultee	Comment	The Project Response
Defra, Meeting, February 2024	Defra stated that they had recommended to the new SoS that there was ecological merit in SAC extensions and that due consideration was being given for inclusion of this measure within the MRF. Defra also informed the Project that this measure would be expected to only be undertaken once, but that it would be delivered strategically once it was clear the total compensation potentially required.	Since discussions with Defra, that Applicant is aware through engagement with Defra and the OWIC derogation group that the SoS has approved SAC extensions being included as a strategic measure for Round 4 and extension projects, with Defra supporting this position. This compensation strategy has been updated to support this advance.
Natural England January 2024 ODOW & Natural England Compensation Workshop	<u>Site Extension</u> Natural England agrees that a designated site extension as a benthic compensation measure would provide the required ecological functionality. While we recognise there are currently policy constraints with progressing this measure, we advise the Project submits a detailed proposal fully demonstrating how this mechanism could work to successfully deliver compensation and what the project contribution would be, noting that it is likely to be delivered strategically.	This is noted by the Project and has been considered. Site extension as a benthic compensation measure is outlined in Section 6.1 – SAC Extension. It is recognised that the delivery of this measure would be outside of the Project's control. However, the Applicant notes that the Defra SoS has now approved designation and extension of Marine Protected Areas (MPAs) in English waters as a strategic compensation measure and confirmed this in writing to the Department for Energy Security and Net Zero (DESNZ) SoS, the Offshore Wind Industry Council and The Crown Estate on 1st February 2024. It is understood that Defra will start work to identify potential areas for designating new sites or extending

[1] Note that only the most recent consultation advice is included within this table as some of the preceding advice is outdated by latest advice.

Consultee	Comment	The Project Response
		existing sites to provide compensation for unavoidable damage to benthic habitats. Defra envisage that this process will be undertaken once (as opposed to multiple designations) to account for projects anticipating the need to use MPA designation as strategic compensation. Suitable areas will be identified based on ecological benefit to ensure that the overall coherence of the National Site Network is maintained, and Defra will use advice from Natural England and the Joint Nature Conservation Committee (JNCC). The extent of the area proposed to be designated in comparison to the potential area lost to cable protection is large. The proposal allows consideration for both the uncertainty around delivering this measure and any possible time lag between the impact occurring and the implementation of compensation. Details of the ecological functionality of proposed extension areas are also presented. The Applicant is clear that the preferred option for compensation (if required) is for strategic compensation in the form of SAC extension .
	<u>Alternative Protection Methodologies</u> Given the legislative changes that would be required, Natural England does not consider this option is viable within the Project's timeframe and therefore	The Project notes that Natural England considers this may become an option in the future and so has included it for completeness.

Consultee	Comment	The Project Response
	advises the Project against pursuing this compensation option	Alternative Protection Methodologies as a benthic compensation measure is outlined Section 6.2 – Alternative Protection Methodologies.
	<u>Redundant Infrastructure</u> Natural England advises that the removal of surface laid/exposed infrastructure has ecological merit as a compensation measure. However, there is no evidence that redundant telecoms cables are causing significant impact on the Annex I Sandbank feature of the IDRBNR SAC or other benthic designated sites. Unless further supportive detailed evidence is provided, Natural England does not consider their removal to constitute suitable compensation as a primary measure.	The Project has put forward the removal of telecommunication 'telecoms' cables as a potential compensation strategy as detailed within Section 6.3. The measure highlights the current constraints of removing other surface laid infrastructure, such as oil and gas pipelines. The potential benefits of removing telecoms cables is detailed within Section 6.3.
	<u>Removal of Aggregate Industry Pressures</u> Natural England is supportive of the option for percentage buyout of aggregate licence(s) as a compensation measure and would encourage further detail to be included at application	The Project anticipates that a reduction in aggregate removal across the site would benefit supporting features and processes of the SAC and proposes to explore aggregate licence holders appetite for a percentage buy out of total licenced aggregate removal quantities. It is assumed that this would have to represent an area as well as a volume to facilitate a benefit to the SAC and a compensation measure for the area impacted by cable protection. Removal of Aggregate Industry Pressures as a benthic compensation measure is outlined Section 6.4 - Removal of Aggregate Industry Pressures

Consultee	Comment	The Project Response
	Marine Debris Removal Natural England is not supportive of this measure. Please see the joint SNCB published paper (Statutory Nature Conservation Body joint advice on marine debris removal as compensation for impacts to benthic habitats from development (jncc.gov.uk)). In addition, evidence is emerging that strongly supports our position of this not being progressed for projects moving forward. This position is supported by Collaboration on Offshore Wind Strategic Compensation (COWSC) research project and consistent with the Round 4 strategic compensation discussions.	The Applicant understands that this measure has limited support from stakeholders and is challenging to implement in the field but notes that this is the only measure approved by the SoS for benthic compensation to date. It is also noted that the inclusion of this measure in the long-list and short-list for the Project predates confirmation from the Defra SoS of MPA designations/SAC extensions being available as a strategic measure. Marine Debris Removal has therefore been retained as a benthic compensation option for the Project and is discussed in Section 6.5.
	Biogenic Reef Creation Natural England does not consider Annex I biogenic Reef restoration/creation as sufficiently 'like for like' for impacts to Annex I Sandbank and advises the Project does not put this forward as a compensation for impacts to Annex I Sandbank. Therefore, no further detailed advice to this measure is provided at this stage.	The strategy for benthic compensatory measures for Annex I sandbank habitat within the IDRBNR SAC considers the creation of biogenic reef, either in the form of blue mussel *Mytilus edulis* beds or reefs of the native oyster *Ostrea edulis*, as capable of compensating for an AEoI to the IDRBNR SAC, where rock-based cable protection may be required over the cables on the sandbank features. The conservation objectives of the IDRBNR SAC include ensuring that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying

Consultee	Comment	The Project Response
		features, by maintaining or restoring their structure and function (including typical species). Creation of new and additional sandbank habitat is not considered possible (other than through the SAC extension option), as artificially created banks can be easily eroded by natural hydrodynamics. Therefore, creation of biogenic reef (the other feature of the SAC) is being pursued as a non-like-for-like measure (in line with Defra, 2021b). In terms of the new compensation hierarchy that is out for consultation (Defra, 2024), this measure can be classed as number 6: "*taking no account of local circumstances where the risk to the feature is predicted to occur, delivered at a distance to the area affected by the plan or projec*t". The creation of blue mussel *M. edulis* beds or reefs of the native oyster *O. edulis*, as a compensation measure is outlined in Section 6.7- Creation of Biogenic Reef.
	<u>Seagrass Bed Habitat Creation/Restoration</u> Subtidal seagrass is not known to be present within the IDRBNR SAC and historic evidence suggests that subtidal seagrass has never been found east of the Solent. Therefore, it is Natural England's view that this proposal should only be included as a very small part (<10%) of a package of measures.	Defra (2021b) guidance indicates that if 'like for like' benthic compensation cannot be provided, then the next stage is the provision of non-like-for-like compensation. The Applicant considers that the restoration or creation of habitat, that whilst not classified as the same as sandbank habitat, has a similar or identical ecological function. Seagrass beds are a sub-types of Annex I habitat "Sandbanks slightly covered by sea water all the time". In terms of the new

Consultee	Comment	The Project Response
		compensation hierarchy that is out for consultation (Defra, 2024), this measure can be classed as number 6: "*taking no account of local circumstances where the risk to the feature is predicted to occur, delivered at a distance to the area affected by the plan or projec*t". The primary objective in relation to the Project would be to undertake off-site creation or restoration of subtidal seagrass bed(s) which provide a similar ecological feature to the sandbank feature that is potentially lost to ensure that the integrity of the site is maintained or restored as appropriate. It should be noted that areas of the IDRBNR SAC have been identified as an area which provided high habitat suitability for seagrass beds (Ward *et al*., 2022). The Applicant acknowledges Natural England's position but does not believe that there would be a need to include seagrass bed restoration in addition to any other of the options identified as potential compensation measures should compensation be required (e.g. other measures would be sufficient to deliver the compensation in isolation). Seagrass Bed Habitat Creation/ Restoration as a compensation measure is outlined in Section 6.8 - Seagrass Bed Habitat Creation/ Restoration.

Consultee	Comment	The Project Response
MMO, Letter response to proposed benthic compensation, October 2023	The MMO notes that ODOW have queried how the creation of biogenic reef within the SAC may impact the IDRBNR byelaw. Additionally, ODOW have queried whether the byelaw can be extended to include newly created reef of *M. edulis* (blue mussel) beds. MMO stated that the byelaw could feasibly be extended/a new byelaw put in place, in principle. If the new reef is considered a feature of the site by Statutory Nature Conservation Bodies (SNCBs) then this would fall under our MPAs process. The byelaw states specific areas which are based on those which SNCBs have advised us should be managed as reef features. So, if SNCBs advise that new areas should be managed in this way then the MMO would do so. The MMO would be looking to the Department for Environment, Food and Rural Affairs (DEFRA) as to whether byelaws can be used for compensation purposes. MMO byelaws require formal consultation and confirmation from the Secretary of State before coming into force. The MMO advises that we would need to know exactly when we would be likely to	The Applicant welcomes that the MMO support the possible proposals of byelaw extension/creation if SNCB's support the cause and appreciate further understanding of the consultation requirements.

Consultee	Comment	The Project Response
	receive such a request to advise on when management could be in place.	

2 Mitigation Strategy

2.1 Natural England Advice on Benthic Mitigation

23. Natural England has produced strategic aims and objectives for offshore wind impact mitigation (Natural England, 2021) based around the impact 'mitigation hierarchy' of avoid, mitigate, and compensate, outlined by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018) with the aim of "development leaving nature in a better state, including through emerging mechanisms for nature improvement and enhancement".
24. As part of the pre-application consultation process, Natural England advised that the impacts on sensitive features of the IDRBNR SAC could be avoided, reduced and mitigated by implementing (but not exclusively) a number of mitigation measures. The suggested mitigation measures and detail of whether these measures could be implemented by the Project are outlined in Table 2.1 below.

Table 2.1 Natural England suggested mitigation measures

Mitigation measure	Implemented by the Project and justification if not
Avoid Designated Sites – e.g., Hornsea Three altered their project design to remove infrastructure from Markham's Triangle Marine Conservation Zone (MCZ)	This has not been implemented - the choice of cable route followed a comprehensive site selection process, details of which are provided in Volume 1, Chapter 4: Site Selection and Consideration of Alternatives. Due to existing infrastructure, only cable routes which had gone north from the array area could have theoretically avoided the IDRBNR SAC, however, these routes were deemed unfeasible as this would have required extensive cable crossings in shallow, inshore waters, that would have been likely deemed a navigational hazard, to reach the landfall location. All routes leaving from the south of the array area could not avoid routing through the SAC, therefore the Project selected the route which had the least impact on the SAC (i.e. shortest route, avoiding known areas of biogenic reef, noting it would not have been possible to avoid all areas of sandbank habitat).
Reduce the number of export cables though the use of high voltage direct current (HVDC) system or coordinated approach with other projects – e.g., Hornsea Three, Norfolk Vanguard and Norfolk Boreas projects	Implemented in part – the Project has committed to the use of high voltage alternating current (HVAC) cable technology only. HVAC cabling has been used for the majority of UK OWFs, including all those commissioned to date. The supply chain for HVDC technology is currently much more constrained and so would have compromised the construction schedule intended to meet operation by 2030.

Mitigation measure	Implemented by the Project and justification if not
	During design discussions, and in line with the mitigation hierarchy, the number of HVAC circuits required has been reduced from six to four; this number is comparable to the number of HVDC circuits used in similar sized projects, e.g. Norfolk Vanguard. It should also be noted that HVDC systems may have a reduced number of circuits compared to HVAC, however this does not necessarily result in a reduced number of cables as multiple cores are required to form a circuit which as a minimum would be 2 circuits with 2 single core cables and a separate fibre optic cable each, this results in a minimum of 6 separate cables. Although likely to be in bundled configuration, there is the possibility that they may not be and installed in separate trenches instead, especially through challenging areas or depending on contractor capability. In addition any subsea joint, pull-in, landfall or repair will be separated out a minimum of 150m either side where applicable resulting in additional remedial protection and likelihood of unburied cable. The use of HVAC technology also helps to reduce impacts associated with onshore infrastructure, specifically in relation to the size of the substation. HVDC also requires a significantly more costly solution for technical and regulatory compliance.
Reduce the number of cable crossings within a designated site to avoid the requirement for cable protection – e.g., Hornsea Three	Yes – the cable routing for the Project ensures that there are no cable crossings required within the SAC.
Cutting and removing sections of disused cables to avoid cable crossings – e.g., Norfolk projects	Yes – if any disused cables are identified during pre-construction works, these will be cut to avoid the need for a cable crossing.
Micro siting cables around reef and other features of ecological importance – all projects post Lincs OWF consent (2008)	Yes – the Project has committed to micro-siting the cable around known *Sabellaria spinulosa* reef. This commitment is secured through the Outline Biogenic Reef Mitigation Plan (document reference 8.22).
Sand wave levelling to reduce risk of free spanning cables and requirement for external cable protection – all projects since 2016 have included an element of this	Yes – sand wave levelling prior to cable installation to reduce the risk of later cable exposure and spanning is embedded into the project design.

Mitigation measure	Implemented by the Project and justification if not
Adoption of the reburial hierarchy with external cable protection being the last resort – all projects	Yes – this is embedded into the project design. Laying the cables following sandwave levelling should reduce the requirement for reburial.
At the pre-consent stage, finalise CBRA using geotechnical data to focus cable protection requirements to areas where cables are likely to be sub-optimally buried (e.g. areas with mixed sediment) – all projects since Norfolk Vanguard	Yes – all offshore cables will be buried to a sufficient depth below the seabed, as far as practicable, with target burial depth determined by the findings of a CBRA as part of the final project design process.
Use of guard vessels and/or advance mapping to avoid sub-optimally buried/surface laid cables negating the need for physical cable protection e.g., the Lincs cable in the Wash	This has not been implemented - the Project cannot commit to this measure; the final choice of cable route and installation methodology aims to facilitate the greatest chance of cable burial.
Requirement to install cable protection with the minimal footprint e.g., pinning – TWT cable corridors work	This has not been implemented – the Project cannot commit to this measure at this stage; cable protection must be sufficient to ensure the integrity of the asset. Additionally, the Applicant has not been able to obtain a copy of this report and as such cannot directly evaluate the measures proposed within it.
Requirement to install cable protection with the greatest likelihood of removal e.g., rock bags at the Norfolk projects	Yes – the Project has committed to only using removable cable protection over the sandbanks within the SAC (Volume 1, Chapter 9: Benthic Subtidal and Intertidal Ecology).
Not using jack up barges/vessels along export cable routes through benthic SACs – e.g., Norfolk projects	Yes – this measure is embedded into the project design.
No cable protection in fisheries byelaw areas to avoid hindering reef recovery, noting that cable may still go through the outskirts of these areas – e.g., Norfolk projects	Yes – this measure is embedded into the project design. Whilst the ECC includes an area to be managed as reef, this will be avoided for all construction works, as detailed within the Outline Biogenic Reef Mitigation Plan (document reference 8.22).
Design rock armouring to mirror the structure and function of geogenic reef – this was advised for the Viking Link interconnector	Yes – whilst not directly relevant for the features in the SAC, the option for ecologically designed rock protection has been included within the project design envelope; the final design for any rock protection will be discussed with the MMO and its advisors pre-construction, where agreement will be sought on whether the use of ecological rock protection is appropriate based on evidence at the time.
Detonation of unexploded ordnance (UXO) outside of designated sites to avoid the	The Project is not including UXO clearance within its DCO Application. The feasibility of this measure

Mitigation measure	Implemented by the Project and justification if not
creation of a crater – suggested for Dudgeon Extension Project (DEP) and Sheringham Shoal Extension Project (SEP)	would be a decision for an Explosive Ordnance Disposal (EOD) expert in the field and would be dependent on this being safe and feasible.

3 Guidance

3.1 European Commission Guidance

25. The Project has taken into consideration the Defra 2021 Guidance (Defra, 2012a), Draft Best practice guidance for developing compensatory measures in relation to Marine Protected Areas (in consultation) (Defra 2021b), European Commission (EC) 2019 Managing Natura 2000 sites (European Commission 2019) and the Inspectorates Advice Note 10 (Planning Inspectorate 2022).
26. It should be noted that an update to the Defra compensation guidance has been published (Defra, 2024), although this is still in consultation and was received during document finalisation, so has not been relied on to inform the development of the strategy but has been considered where possible. .
27. Should the SoS conclude that an AEoI cannot be ruled out, there are no alternative solutions and that imperative reasons of overriding public interest apply, Article 6(4) of the Habitats Directive *"requires that all necessary compensatory measures are taken to ensure the overall coherence of the network of European sites as a whole is protected."*
28. As mentioned previously, ideally compensation should be functioning before the effects take place, although it is recognised that this may not always be possible, as stated in the EC Guidance (2012): *"in principle, the result of implementing compensation has normally to be operational at the time when the damage is effective on the site concerned. Under certain circumstances where this cannot be fully fulfilled, overcompensation would be required for the interim losses."*
29. The (2023) National Policy Statement for Renewable Energy Infrastructure (EN-3) states that applicants should refer to the latest Defra compensation guidance. Defra (2021a) sets out the following principles that compensation should satisfy:
30. Link to the conservation objectives for the site or feature and address the specific damage caused by the permitted activity;
31. Focus on providing the same ecological function for the species or habitat that the activity is damaging OR, where this is not technically possible, provide functions and properties that are comparable to those that originally justified designation;
    - Not negatively impact on any other sites or features;
    - Ensure the overall coherence of designated sites and the integrity of the MPA network; and
    - Be able to be monitored to demonstrate that they have delivered effective and sustainable compensation for the impact of the project. The monitoring and management strategy must require further action to be taken if the compensation is not successful.
32. In relation to the Defra (2021b) guidance, this provides a hierarchy approach shown in Table 3.1.

Table 3.1 Compensation hierarchy (Source: Defra, 2021b) [2]

Hierarchy of Measures	Description
1. Address same impact at same location.	Address the specific impact caused by the permitted activity in the same location (within the site boundary)
2. Same ecological function different location	Provide the same ecological function as the impacted feature; if necessary, in a different location (outside of the site boundary)
3. Comparable ecological function same location	Provide ecological functions and properties that are comparable to those that originally justified the designation in the same location as the impact (within the site boundary)
4. Comparable ecological function different location	Provide ecological functions and properties that are comparable to those that originally justified designation; if necessary, in a different location (outside of the site boundary)

33. The guidance states that the compensation should be secured before the impact takes place, recognising that ideally the compensation would be functioning prior to construction but that this is not always possible: *"Where this is not possible, it is important that necessary licences are in place, finances are secured, and realistic implementation plans have been agreed with the appropriate bodies to demonstrate that the compensatory measure is secured."*

34. As stated within Natural England's DAS advice letter (January, 2024): *"Natural England wishes to ensure that the habitats found at this site and their current condition are at the forefront of decision making when considering compensation package proposals. Within the framework of the current compensation hierarchy guidance (DEFRA, 2021), Natural England's advice is presented in the context of maintaining the ecological function of the designated feature being lost to development. By ecological function, Natural England means the natural processes, products and services that living and non-living environments provide within or between species, ecosystems and landscapes".*

35. The current consultation held as part of Defra's Offshore Wind Environmental Improvement Package (OWEIP) focusses on 'ecological effectiveness' and 'local circumstances' as the primary consideration when identifying compensatory measures, with measures that benefit the specific feature at risk being encouraged over measures that would benefit different qualifying features at risk but which could provide 'functional equivalence'.

[2] New guidance was published whilst this document was being finalised (https://consult.defra.gov.uk/offshore-wind-environmental-improvement-package/consultation-on-updated-guidance-for-environmental/supporting_documents/090224%20OWEIP%20Consultation%20on%20updated%20policies%20to%20inform%20guidance%20for%20MPA%20assessments_.pdf). Whilst the Applicant is aware of this documentation it is noted that (1) the documentation is still out for consultation and (2) the Project delivery programme did not allow for full inclusion of the recommendations.

4 Inner Dowsing, Race Bank and North Ridge SAC

4.1 Overview

36. The IDRBNR SAC covers an area of 845km^2 and is located off the south Lincolnshire coast, extending eastwards and north from the Burnham Flats on the North Norfolk coast, occupying the Wash Approaches. As this site straddles the 12nm limit, advice is jointly delivered between the JNCC and Natural England.
37. The IDRBNR SAC encompasses a wide range of sandbank types and biogenic reef (JNCC and Natural England, 2010) and has therefore been designated for two Annex 1 habitat protected features:
    - Annex I "Sandbanks slightly covered by seawater all of the time" (Annex I Sandbanks); and
    - Annex I "biogenic reef" (Annex I reef)
38. The main sandbank features, which is the focus of this plan, occur within the Wash Approaches, the Race Bank-North Ridge-Dudgeon Shoal system and at Inner Dowsing. The tops of the sandbanks are characterised by communities of polychaetes and amphipods. The trough areas between these sandbank features are composed of mixed and gravelly sands. The sandbanks are characterised by their sub-features: Subtidal Coarse Sediment, Subtidal Sand and Subtidal Mixed Sediment.
39. In 2022, the MMO enforced spatial restrictions within the SAC by placing a byelaw to specifically protect sandbank and reef features in the SAC from fishing pressures (Figure 4.1). The establishment of the byelaw was informed by the MMO fisheries assessment of the SAC (Joyce *et. al.,* 2021), which concluded that the preferred means of protection of the SAC would be via implementation of a (now active) byelaw to ensure the risk of adverse effect on site integrity is removed by prohibiting bottom towed fishing gear over the sandbank and reef features and prohibiting static gears over the reef features.

4.2 Conservation Objectives

40. The conservation objectives apply to the site and individual species and/or assemblage of species for which the site has been classified (the Annex 1 habitat features listed above). The 'Supplementary Advice on Conservation Objectives'[3] that was published in May 2023 reveals that for both 'Reefs' and 'Sandbanks which are slightly covered by sea water all the time' the target is to restore these features.

[3] https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030370&SiteName=race+bank&SiteNameDisplay=Inner+Dowsing%2c+Race+Bank+and+North+Ridge+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=

41. The conservation objectives for the site are therefore to ensure that, subject to natural change, the integrity of the site is restored, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by restoring:

- the extent and distribution of qualifying natural habitats and habitats of the qualifying species;
- the structure and function (including typical species) of qualifying natural habitats;
- the structure and function of the habitats of the qualifying species;
- the supporting process on which qualifying natural habitats and the habitats of qualifying species rely;
- the population of each of the qualifying species; and
- the distribution of qualifying species within the site.

4.2.1 Favourable Condition

42. 'Favourable condition' is the term used in the UK to represent 'Favourable Conservation Status' for the interest features of SACs. For an Annex 1 habitat, 'Favourable Conservation Status' occurs when:

- its natural range and the area it covers within that range are stable or increasing;
- the specific structure and function, which are necessary for its long-term maintenance, exist and are likely to continue to exist for the foreseeable future; and
- the conservation status of its typical species is favourable.

43. Favourable condition of Annex I Sandbanks which are slightly covered by seawater all the time and Annex I Reefs is based on the long-term maintenance of the following (JNCC and Natural England, 2013):

- extent of the habitat (and elevation and patchiness for reef);
- diversity of the habitat;
- community structure of the habitat (population structure of individual species and their contribution to the function of the habitat); and
- natural environmental quality (e.g., water quality, suspended sediment levels.

4.2.2 Existing Pressures on the IDRBNR SAC

44. The IDRBNR sandbank features are currently vulnerable (medium to high risk) to:

- Abrasion/disturbance of the substrate on the surface of the seabed – e.g. aggregate dredging, oil and gas, fishing, OWFs, cables, vessel anchorages, outfalls, coastal development;
- Barrier to species movement (Reefs only) – e.g. outfalls, coastal development;
- Changes in suspended solids (water clarity) (sandbanks only) – e.g. aggregate dredging, oil and gas, fishing, cables, outfalls, coastal development;

- Habitat structure changes – removal of substratum (extraction) – e.g. aggregate dredging, oil and gas, OWFs, outfalls;
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion – e.g. aggregate dredging, oil and gas, fishing, OWFs, cables, vessel anchorages, outfalls, coastal development;
- Physical change (to another seabed type) – e.g. oil and gas, OWFs, cables;
- Physical change (to another sediment type) – e.g. aggregate dredging, oil and gas, OWFs, cables, outfalls, coastal development;
- Physical loss (to land or freshwater habitat) – e.g. OWFs, outfalls;
- Removal of non-target species – e.g. aggregate dredging, fishing;
- Smothering and siltation rate changes (sandbanks only) – e.g. aggregate dredging, oil and gas, fishing, OWFs, cables, outfalls, .coastal development;

45. Therefore, to fulfil the conservation objectives for these Annex I features, the Competent Authorities for this area are advised to manage human activities within their remit such that they do not result in further deterioration or disturbance of the site's features from the pressures outlined above (JNCC and Natural England, 2013).

4.2.3 Targets for Achieving Favourable Condition

4.2.3.1 Annex I Sandbanks

46. Natural England's Supplementary Advice Targets[4] of relevance to the Project for Annex I sandbanks are outlined in Table 4.1.

Table 4.1 Supplementary advice targets for sandbanks of relevance to the Project.

Attribute	Target
Distribution: presence and spatial distribution of biological communities	Restore the presence and spatial distribution of subtidal sandbank communities.
Extent and distribution	Restore the total extent and spatial distribution of subtidal sandbanks to ensure no loss of integrity, while allowing for natural change and succession.
Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species, to enable each of them to be a viable component of the habitat.
Structure: non-native species and pathogens	Restrict the introduction and spread of non-native species and pathogens, and their impacts.

4 https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030370&SiteName=inner+dowsing&SiteNameDisplay=Inner+Dowsing%2c+Race+Bank+and+North+Ridge+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&NumMarineSeasonality=%2c0

Attribute	Target
Structure: sediment composition and distribution	Restore the distribution of sediment composition across the feature (and each of its subfeatures).
Structure: species composition of component communities	Maintain the species composition of component communities.
Structure: topography	Maintain the presence of topographic features, while allowing for natural responses to hydrodynamic regime, by preventing erosion or deposition through human-induced activity.
Structure: volume	Maintain the existing (where no previous evidence exists) or best-known (where some evidence exists) volume of sediment in the sandbank, allowing for natural change.
Supporting processes: energy / exposure	Maintain the natural physical energy resulting from waves, tides and other water flows, so that the exposure does not cause alteration to the biotopes and stability, across the habitat
Supporting processes: physico-chemical properties (habitat)	Maintain the natural physico-chemical properties of the water
Supporting processes: sediment contaminants	Restrict surface sediment contaminant levels to concentrations where they are not adversely impacting the infauna of the feature (and each of its subfeatures)
Supporting processes: sediment movement and hydrodynamic regime (habitat)	Maintain all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered or prevented from responding to changes in environmental conditions
Supporting processes: water quality - contaminants (habitat)	Reduce aqueous contaminants to levels equating to High Status according to Annex VIII and Good Status according to Annex X of the Water Framework Directive, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data
Supporting processes: water quality - dissolved oxygen (habitat)	Maintain the dissolved oxygen (DO) concentration at levels equating to High Ecological Status (specifically ≥5 mg/L (at 35 salinity) for 95 % of year) avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data
Supporting processes: water quality - nutrients (habitat)	Maintain water quality at mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features, avoiding deterioration from existing levels. This target was set using the Environmental Agency 2019 water body classifications data
Supporting processes: water quality - turbidity (habitat)	Maintain natural levels of turbidity (e.g. concentrations of suspended sediment, plankton and other material) across the habitat

4.3 Quantification of Effect on the IDRBNR SAC

47. The offshore ECC for the Project passes due east-west through the IDRBNR SAC, crossing the North Ridge sandbank system at the eastern extent of the SAC and the Inner Dowsing sandbank at the western edge.
48. In the RIAA, the Applicant provides an assessment of both habitat loss and habitat disturbance for Annex I Sandbanks. Habitat loss associated with cable protection would be long term, for the duration of the project, which is expected to be approximately 35 years, whereas habitat disturbance would be short-term.
49. Any material dredged from within the SAC will be deposited back within the SAC. Following re-settlement of the deposited sediments, they will be immediately available again for transport at the naturally occurring rate and direction, controlled entirely by natural processes. As such, the sediment will have immediately re-joined the natural sedimentary environment within the local area and so by definition is not 'lost from the system' due to the dredging/spoil disposal process. Due to the dynamic nature of the sandwaves, these morphological features are considered to have moderate levels of recoverability (Chapter 7: Marine Physical Processes (Document Reference 6.1.7)). Furthermore, the Confidential Sediment Mobility Study (Document Reference 6.3.7.3) for the Project, based on the geophysical and geotechnical surveys undertaken, has confirmed that natural sediment mobility in the offshore ECC is sufficient to ensure remobilisation of sediments within the sandbank system to allow the reformation of the sandbanks following cable installation.
50. As detailed within Chapter 9: Benthic Subtidal and Intertidal Ecology (Document Reference: 6.1.9), the patterns of processes governing the overall evolution of the systems (the flow regime, water depths and sediment availability) are at a much larger scale than, and so would not be affected by, the proposed local works. As a result, the proposed clearance is not likely to influence the overall form and function of the system and eventual recovery via natural processes is therefore expected. The rate of recovery would vary in relation to the rate of sediment transport processes, faster infill and recovery rates will be associated with higher local flow speeds and more frequent wave influence (Chapter 7: Marine Physical Processes (Document Reference 6.1.7). Pre- and repeated post-construction monitoring of the Race Bank offshore cable route (DONG Energy, 2017) has demonstrated partial recovery of sandwave crest features, following sandwave clearance, within a four-month period for which data are presently available. The sediment type and distribution are anticipated to return to the pre-impacted state over time, therefore it is considered that there will be no adverse effect on the conservation objectives for the sandbanks which are slightly covered by sea water all of the time feature of the IDRBNR SAC.

51. The Greater Gabbard OWF constructed arrays across two sandbanks known as the Inner Gabbard and the Galloper sandbanks, however post-construction monitoring revealed sediment types and distribution remained the same, with only minor changes likely brought on by storm events and the resulting fluctuations in mud content, and faunal communities remained generally similar throughout the survey (CMACS, 2014).
52. The sediment characteristics and macrofauna of offshore sandbanks were studied before and after construction (2005–2010) of six gravity-based foundations in an OWF in the North Sea (Coates *et al*., 2015). The sandbanks were identified as highly heterogeneous with *Nephtys cirrosa*, *Oncaea borealis* and *Glycera lapidum* communities predominating with low species abundance and diversity (Coates *et al*., 2015). During construction, appreciable differences in community composition were observed, with a higher total abundance and an overall increase of the opportunistic species *Spiophanes bombyx* (Coates *et al*., 2015). From six to eight months post-construction, there were few to no changes in the median sediment grain size, possibly as a result of a quick recovery of the sedimentological characteristics (Coates *et al*., 2015). Further demonstrating how resilient and well-adapted the sandbanks are to physical disturbances. The macrofaunal community rapidly recovered post-construction, with recolonisation of the initial community 1.5 years after construction activities (Coates *et al*., 2015). Overall, the benthic ecosystem quality index indicator had an acceptable status score for the benthic characteristics between the impact and control areas over the course of the long-term monitoring, indicating that dredging had minimal effects on the benthic soft sediment community (Coates *et al*., 2015).
53. Natural England's marine condition assessment (available within the online conservation advice package reports) is that 33% of the sandbank feature has been categorised as 'unfavourable' status, due to the presence of the Race Bank OWF on the Race Bank sandbank (Natural England, 2023) based on the limited attributes that were assessed (not limited to 'restore' attributes). Specifically, this appears to be due to the failure of the conservation site to achieve its general management targets set as restoring the total extent and spatial distribution of subtidal sandbanks, restricting surface sediment contaminant levels, and maintaining all hydrodynamic and physical conditions such that natural water flow and sediment movement are not significantly altered. As demonstrated by the worst case scenario, the scale of the impacts of this Project cannot be considered to be of the scale and characteristic of those from Race Bank OWF.

4.3.1 Cable Protection Worst Case Scenario

4.3.1.1 Sandbanks

54. Based on the information presented within the (Confidential) Cable Burial Risk Assessment (CBRA) (document reference 6.3.3.1), it is highly likely that ground conditions will allow burial of the export cable across the sandbank features of the IDRBNR SAC and therefore no cable protection is expected to be required as a result of partially buried cables on these features. However, this cannot be confirmed until cable installation has been completed and therefore a worst-case scenario for cable protection has been established (to e.g. account for tool failure during construction, or other installation challenges).
55. The predicted worst-case scenario set out below relating to the potential effect of the deployment on the IDRBNR SAC incorporates the mitigation strategy as detailed within Section 3. It should be noted that the Project has committed to cable protection (should it be required) on Annex I sandbanks that could be removed at the end of the life of the cables.

Footprint of Cable Protection within the IDRBNR SAC on Sandbanks

56. It is anticipated that, if cable protection is required, the worst-case area of impact within the IDRBNR SAC would be 2,880m^2 (0.288 hectares) over each sandbank (North Ridge sandbank and the Inner Dowsing sandbank). The total worst-case maximum impact on sandbank features within the SAC is 5,760 m^2 (0.576 hectares), which equates to 1.84% of the sandbanks feature within the SAC. Full details of the proposed works through the SAC are detailed within Part 6, Volume 1, Chapter 3: Project Description (document reference 6.1.3).
57. The Project has committed to removing cable protection at the end of the life of the cables across Annex I sandbank features, where required.

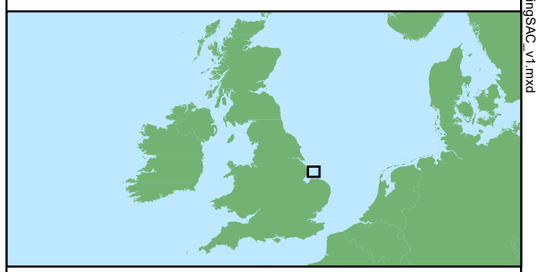
340000
360000
5920000
5900000
N

Legend

- 6nm Limit
- Indicative Box (2,880m^2)
- Offshore Export Cable Corridor
- Inner Dowsing, Race Bank and North Ridge Special Area of Conservation

SAC Components

- High Confidence Sandbank Habitat
- Annex I Sandbank
- Annex I Reef - Biogenic
- Areas Managed As Reef (MMO)
- Areas Managed As Reef (JNCC)



Coordinate System: WGS 1984 UTM Zone 31N

0 5 10 km

Scale: 1:150,000

A3 Page Size

IDRBNR SAC boundaries, showing the location of the Project offshore ECC and designated habitat features
(Annex I sandbanks and biogenic reefs)

Figure 4.1

OUTER DOWSING OFFSHORE WIND

Date: 06/03/2024
Produced By: BPHB
Revision: 0.1

GoBe

5 Benthic Compensation Approach

5.1 Longlist

58. The first stage of the "without prejudice" benthic compensation strategy involved reviewing all OWF projects that have proposed equivalent compensatory measures to date; associated consultation responses and relevant research projects were also considered. A longlist was collated based, in part, on the compensation provided as part of previous UK OWF derogation cases. This focused primarily on projects that have submitted DCO applications within the southern North Sea region as these are located within the same geographic regions as the Project and are likely to impact similar features and sites.

5.2 Shortlist Ranking System

59. The longlist options for sandbanks were grouped into four compensation themes: habitat improvement, habitat creation, reserve creation and threat reduction.

60. Table 5.1 shows the initial RAG assessment results for the longlist options for IDRBNR SAC.

61. Of the compensation options aimed at compensating for sandbanks specifically, seven were ranked as red (low scoring), four as amber (intermediate scoring) and five as green (high scoring). Initially, only the green options were taken forward to the shortlist; however, following consultation with Natural England, aggregate dredging pressure removal was added as an option to the short list.

Table 5.1 RAG scores for sandbank compensation options

Compensation option	RAG Score
Extend an SAC	GREEN
Redundant infrastructure removal	GREEN
Marine debris removal	GREEN
Marine debris reduction awareness and engagement	GREEN
Creation of biogenic reef	GREEN
Further fisheries management	AMBER
Marine activity restrictions	AMBER
Aggregate dredging activity management	AMBER
Removing marine non-native species	AMBER
Extend the IDRBNR SAC - *S. spinulosa* reef	AMBER
Enhancement of *S. spinulosa* reef	RED
Enhancement of sandbanks	RED
Establish a new site (with appropriate management)	RED
Management of physical and chemical processes	RED
Management of navigational and maintenance dredging methods	RED

62. Following consultation, two additional compensation options were added: designation of a byelaw/other protections to protect a feature outside an SAC ; and seagrass creation and/or restoration.

5.3 Strategic Compensation

63. One of the principal challenges for developers in relation to derogation is identifying and securing robust compensatory measures which are acceptable to regulators and SNCBs. To address this challenge, Defra is proposing to "*develop a library of ecologically robust strategic compensatory measures in partnership with industry and environmental stakeholders that are commercially feasible and deliverable*" (Defra, 2022).
64. Defra (2022) defined 'strategic compensatory measures' as measures "*that work across a wide area, joining-up across projects and organisations to deliver an ecological benefit greater than the sum of its parts and/or measures that can only be delivered by Government (e.g., enhanced protection of MPAs)*."
65. The Project understands that Natural England regards strategic compensation as ecologically effective and could provide a solution to species or habitats impacted by multiple OWFs. Furthermore, the British Energy Security Strategy (BESS) commits to both speeding up the deployment of offshore wind and to the measures proposed in the Offshore Wind Environmental Improvement Package policy paper, including strategic compensatory measures and a centralised Marine Recovery Fund (MRF) to help facilitate delivery of these measures.
66. Once in place, the proposed MRF will provide a framework to allow developers to deliver strategic compensation in a coordinated way through contributions to the fund. The MRF will also provide a mechanism for the delivery of strategic compensation measures, with appropriate input from regulators and SNCBs. This coordinated approach should enable ecological benefit to the national site networks to be maximised and delivered in a timely manner. The Energy Act received Royal Assent on the 26th October 2023. However, subsequent secondary legislation will be required to set up the MRF. At present there is a lack of clarity about the timing for establishing the MRF, although it is expected to be operational by the end of 2024.
67. As detailed within Table 1.1, recent consultation with Defra and Natural England has highlighted that the SoS has approved strategic SAC extensions for Round 4 OWF and extension Projects, where compensation may be required. It was noted that whilst the MRF might not be available for the delivery of compensation for Round 4 OWF and extension projects, the availability of a strategic compensation measure for SAC extensions (through another mechanism) should be available during examination for the Round 4 and extension projects.
68. SAC extensions therefore would be strategically led by Defra in consultation with the JNCC and Natural England and to an extent are therefore outside the Project's control. The Project has developed this documentation considering the recent advice and confirms that the Project's current preference would be contribution to the delivery of the appropriate SAC extension proportionate to the Project's impact, if compensation was deemed a requirement.

69. The latest draft guidance currently for consultation 'Consultation on policies to inform updated guidance for MPA assessments' (Defra, 2024) states that: "*The updated guidance will support the delivery of compensatory measures at a strategic scale for marine industries planning to apply for consent within the next 18 months*".

70. Whilst all the above supports the move towards strategic compensation for subtidal benthic impacts, it is still not clear the mechanism for doing so in the timeframes required by the Project. However, as deliberated during consultation with Natural England and Defra (Table 1.1), efforts are being made to fast track the availability of strategic compensation for those Round 4 and extension projects that might require it during examination.

6 “Without Prejudice” Benthic Compensation Strategy for Sandbanks

71. Following the short-listing process, the following measures have been further developed to explore how each could be delivered, considering:
    - The specific benefit of each measure to the National Site Network;
    - The expected scale which may be required;
    - How the measure would be delivered;
    - Specific challenges associated with implementation; and
    - Monitoring requirements.
72. The following sections present information and signposting to the Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3) to address the above points for each of the short-listed measures. The short-listed measures are the following:
    - SAC Extension;
        - Alternative habitat protection measures, e.g. designation of a byelaw and other protections;
    - Removal of anthropogenic pressures;
        - Redundant infrastructure removal;
        - Removal of aggregate industry pressures;
        - Marine debris removal, awareness and engagement;
    - Creation of biogenic reef:
        - Blue mussel (*M. edulis*) reef creation;
        - Native oyster (*O. edulis*) reef creation; and
    - Seagrass restoration/creation.

6.1 SAC Extension

73. An option for compensation for Annex 1 sandbank is changing the boundary (extending the area) of an existing SAC designated for sandbanks to include an additional area of qualifying sandbank habitat. The protection of currently unprotected Annex 1 sandbank habitat anywhere in the UK could potentially deliver compensation for the Project. SAC extensions with ecological merit include an extension to the IDRBNR SAC boundary to encompass the sandbank system (Docking Shoal) and supporting habitats outside but next to the current boundary and a westerly extension of the Haisborough, Hammond and Winterton (HHW) SAC.
74. Fundamentally, however, this is a strategic measure that must be delivered by Defra in conjunction with Natural England and the JNCC. Defra envisage that this process will be undertaken once to account for all projects anticipating the need to use MPA designation as strategic compensation.

75. The Applicant's preferred option for compensation, if required, is to provide a contribution to a strategic SAC extension. Detailed information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation, is provided in the Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3), see particular detail in relating to the following sections:

- Evidence Base (Section 3.2) which includes details on value and function of the measure, ecosystem functionality of the proposed measure, review of existing data within the SAC extension area;
- Delivery Process (Section 3.3) which includes details on site selection and scale of the proposed extension, a review of other users within the extension areas, proposed delivery timeframe and monitoring and adaptive management; and
- Funding (Section 3.4), which includes detail on indicative costs of the measure.

6.2 Alternative Protection Methodologies

76. The Project has been exploring other options for the protection of sandbank habitat, outside of an SAC, where an extension to an SAC is not possible or feasible in the timescales required.
77. Further information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation, is provided in Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3). The details of this measure are less progressed than that of other measures put forward because the Project has included this measure if an SAC extension does not materialise.

6.3 Redundant Infrastructure Removal

78. Part of the suite of compensation measures for Annex 1 Sandbanks is the removal of infrastructure that is no longer in use, i.e. subsea cables or oil and gas infrastructure, and which has been installed on sandbank habitat within a SAC designated for sandbanks in the region (or, if no suitable infrastructure is identified within an SAC, then on similar habitat within the region). As artificial features represent an existing pressure on the relevant designated sites, thereby hindering the development of Annex I habitats or impacting on the overall integrity of a site, the removal of existing out of service infrastructure could remove or reduce existing pressures and provide a compensatory measure.
79. Natural England has advised that compensation measures which reduce/remove anthropogenic pressures that impact upon the favourable conservation status of the SAC features are likely to deliver the compensation requirements from an ecological perspective. This could include the removal of redundant infrastructure which would otherwise remain in situ.
80. Detailed information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation, is provided in Benthic Compensation Evidence and Roadmap (Document 7.6.3). See particular detail relating to the following sections:

- Evidence Base (Section 6.2) which includes details on the evidence of this as a compensation measure;
- Delivery Process (Section 6.3) which includes details on site selection and scale of the removal likely to be required, the proposed delivery timeframe and monitoring and adaptive management; and
- Funding (Section 6.4), which includes detail on indicative costs of the measure.

6.4 Removal of Aggregate Industry Pressures

81. One of the anthropogenic pressures acting on the marine environment within SACs is aggregates extraction. Mobile sandbank systems, such as that within the IDRBNR SAC, are dependent on a continuous resupply of sediment, both locally and on a wider scale; therefore, the removal of sediment within a sandbank system, even if not directly on a sandbank, may act to reduce the resilience of the sandbank system to recover from impacts.
82. There are a number of licensed aggregate extraction areas within and adjacent to the IDRBNR SAC, as detailed in Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3).
83. Therefore, whilst not necessarily the cause of the change in the conservation status of the features of the SAC, aggregates removal is a pressure acting on the features and as such the early removal/reduction of this pressure on the SAC could be considered to be compensation.
84. Further information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation, is provided in Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3). See particular detail relating to the following sections:
    - Progress on this Measure (Section 7.2) which includes details on the progress and feasibility of this as a compensation measure and an indicative delivery timeframe.

6.5 Marine Debris/Litter Removal

85. The conservation objectives of the IDRBNR SAC include ensuring that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features by maintaining or restoring their structure and function.
86. The removal of marine debris would be a direct means to improve habitat quality within the IDRBNR SAC serving to support the restoration of the sandbank habitat. It is expected that any debris/litter to be removed would predominantly constitute abandoned or lost fishing gear or dropped objects. If this remediation activity was supported by an awareness campaign (see Marine Debris Awareness and Engagement below) that targeted the introduction of measures to facilitate the rapid recovery of any lost gear in the future, the contribution it would make to restoration of the SAC would be even greater and further harm could be avoided or limited.

87. However, the Applicant acknowledges Natural England's position that these measures are insufficient to compensate for the predicted impacts of cable protection and that such a measure could be difficult to deliver, dependent on the quantum of debris required for removal. This is discussed further within the Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3).

88. Detailed information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation, is provided in Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3). See particular detail relating to the following sections:

- Evidence Base (Section 8.2) which includes details on the evidence and ecological benefit of this as a compensation measure;
- Delivery Process (Section 8.3) which includes details on site selection and scale of the removal likely to be required, the proposed delivery timeframe and monitoring and adaptive management; and
- Funding (Section 8.4), which includes detail on indicative costs of the measure.

6.6 Marine Debris/Litter Awareness and Engagement

89. The conservation objectives of the IDRBNR SAC include ensuring that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features by maintaining or restoring their structure and function. As discussed above, this can in part be achieved by the recovery and removal of marine debris. However, in addition to the direct causes of loss of fishing gear (such as snagging and entanglement) there are also indirect causes that result in lost or abandoned gear, including a lack of disposal facilities and inaccessible or expensive disposal facilities for redundant gear.

90. It is logical that the reduction of the input of debris into the marine environment at source is the first step in alleviating this pressure. Consequently, a reduction and awareness campaign will be implemented with the aim of reducing future marine debris entering the IDRBNR SAC to support recovery and removal of marine debris and thus providing a longer-term compensation measure.

91. The awareness campaign would focus on stakeholder engagement to promote a 'stopping at the source' approach to reducing marine debris and aims to target several marine debris sources including lost and abandoned fishing gear, debris from other industries, recreational activities, and onshore sources. This campaign would aim to promote long term changes in activities and processes from those groups that the awareness campaign will target.

92. Detailed information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation, is provided in Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3). See particular detail relating to the following sections:

- Evidence Base (Section 9.2) which includes details on the evidence and ecological benefit of this as a compensation measure;
- Delivery Process (Section 9.3) which includes details on site selection and scale of the removal likely to be required, the proposed delivery timeframe, monitoring and adaptive management; and
- Funding (Section 9.4), which includes detail on indicative costs of the measure.

6.7 Creation of Biogenic Reef

93. This strategy for benthic compensatory measures for Annex I sandbank habitat within the IDRBNR SAC considers the creation of biogenic reef, either in the form of blue mussel *M. edulis* beds or reefs of the native oyster *O. edulis*, as capable of compensating for an AEoI to the IDRBNR SAC, where rock-based cable protection may be required over the cables on the sandbank features.
94. Creation of new and additional sandbank habitat is not considered possible, as artificially created banks can be easily eroded by natural hydrodynamics. Therefore, creation of biogenic reef (the other feature of the SAC) is being proposed. In terms of the new compensation hierarchy that is out for consultation (Defra, 2024), this measure can be classed as number 6: "*taking no account of local circumstances where the risk to the feature is predicted to occur, delivered at a distance to the area affected by the plan or projec*t".
95. The creation of these biogenic reefs would provide equivalent ecosystem services to the component communities of the existing *S. spinulosa* reef. As natural components of the wider ecosystem, with demonstrable historical presence, this measure would support the existing conservation measures for biogenic reef within the SAC. Furthermore, sandbanks and biogenic reef features are often co-located and provide complementary ecosystem services. As such, this measure would support the integrity of the wider National Site Network through supporting the key component communities associated with a combination of sandbank and reef habitats.
96. The creation of biogenic reefs would follow established standards and best practice guidelines and would be conducted in close collaboration with stakeholders and restoration experts. Detailed information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation for both native oyster and blue mussel reef, is provided in Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3). See particular detail relating to the following sections:
    - Option 1: Creation of Native Oyster Beds (Section 5.3) which includes a full detailed strategy for the creation of native oyster beds; and
    - Option 2: Creation of Blue Mussel Beds (Section 5.4) which include a full detailed strategy for the creation of blue mussel beds.

6.8 Seagrass Bed Habitat Creation/Restoration

97. If 'like for like' benthic compensation cannot be provided, then the provision of non-like-for-like compensation should be considered, as detailed within the relevant guidance (Defra, 2021). One such approach would be the restoration or creation of habitat, that whilst not classified as the same as sandbank habitat, has a similar or identical ecological function.
98. Seagrass beds are a sub-types of Annex I habitat "Sandbanks slightly covered by sea water all the time" (Ward *et al*., 2022). This measure is expected to have a beneficial effect on other ecological facets such as providing habitat for fish species which in turn provide a food resource for local bird populations.
99. Detailed information regarding the progress of this as a compensation measure, including ecological evidence and a roadmap to implementation for seagrass bed creation/restoration, is provided in Without Prejudice Benthic Compensation Evidence Base and Roadmap (Document 7.6.3). See particular detail relating to the following sections:
    - Evidence Base (Section 10.2) which includes details on the evidence and ecological benefit of this as a compensation measure;
    - Delivery Process (Section 10.3) which includes details on site selection and scale of the creation likely to be required, the proposed delivery timeframe, monitoring and adaptive management; and
    - Funding (Section 10.4), which includes detail on indicative costs of the measure.

7 References

CIEEM (2018). Guidelines For Ecological Impact Assessment In The UK And Ireland Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management. Available at: https://cieem.net/wp-content/uploads/2019/02/Combined-EclA-guidelines-2018-compressed.pdf

CMACS (2014). Greater Gabbard Offshore Wind Farm Year 1 post-construction benthic ecology monitoring survey technical report (2013 survey). Report prepared by Centre for Marine and Coastal Studies Ltd for Greater Gabbard Offshore Wind Farm Ltd. 237pp.

Coates, D.A., van Hoey, G., Colson, L., Vincx, M. and Vanaverbeke, J. (2015), Rapid macrobenthic recovery after dredging activities in an offshore wind farm in the Belgian part of the North Sea. Hydrobiologia, 756(1), 3–18. Defra (2021a), Habitats regulations assessments: protecting a European site. Available at https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site [Accessed February 2024]

Defra (2021b) Best practice guidance for developing compensatory measures in relation to Marine Protected Areas. Available at https://consult.defra.gov.uk/marine-planning-licensing-team/mpa-compensation-guidance-consultation/supporting_documents/mpacompensatorymeasuresbestpracticeguidance.pdf [Accessed February 2024]

Defra (2024). Consultation on policies to inform updated guidance for Marine Protected Area (MPA). Available at: https://consult.defra.gov.uk/offshore-wind-environmental-improvement-package/consultation-on-updated-guidance-for-environmental/supporting_documents/090224%20OWEIP%20Consultation%20on%20updated%20policies%20to%20inform%20guidance%20for%20MPA%20assessments_.pdf [Accessed: February 2024]

Department for Energy Security and Net Zero (2023). National Policy Statement for Renewable Energy Infrastructure (EN-3). Available at: https://assets.publishing.service.gov.uk/media/64252f5f2fa 848000cec0f52/NPS_EN-3.pdf

DONG energy. (2017) Race Bank Offshore Wind Farm Export Cable Sandwave Levelling Monitoring Data (various). Available from https://marinelicensing.marinemanagement.org.uk (application reference: MLA/2015/00452/5) [Accessed on January 2023].

European Commission (2012) (2007 Revised, 2012). Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: alternative solutions, imperative Reasons of overriding public interest, compensatory measures, Overall coherence, opinion of the commission. Available at: http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/new_guidance_art6_4_en.pdf

JNCC and Natural England (2010) Special Area of Conservation (SAC): Inner Dowsing, Race Bank and North Ridge, SAC Selection Assessment. Assessment Document Version 5.0. Available at: https://data.jncc.gov.uk/data/a29c186f-6241-47dd-8077-58bbb0819522/IDRBNR-SAC-selection-assessment-v5-0.pdf [Accessed: November 2023]

JNCC and Natural England (2013) Natural England & JNCC., (2016), ???? I have found a joint NE JNCC document discussing the extension of the SPA which is dated 2015 (do we have the correct date in the text?) - Natural England & JNCC., (2016). Outer Thames Estuary potential Special Protection Area. Available at: Natural England & JNCC., (2016)

Joyce, R., Johnston, E. and Graham, C. (2021). Inner Dowsing, Race Bank and North Ridge Special Area of Conservation (SAC) Marine Management Organisation Fisheries Assessment. Inner_Dowsing__Race_Bank_and_North_Ridge_SAC_MMO_Fisheries_Assessment.pdf (publishing.service.gov.uk). [Accessed: September 2023].

Natural England (2023). Natural England and JNCC Conservation Advice for Marine Protected Areas Inner Dowsing, Race Bank and North Ridge SAC. [Online] URL: https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030370&SiteName=inner%20dows&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=&HasCA=1&NumMarineSeasonality=0&SiteNameDisplay=Inner%20Dowsing,%20Race%20Bank%20and%20North%20Ridge%20SAC#condition

Planning Inspectorate (2022). Advice Note Ten: Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects. Available at https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/ [Accessed February 2024]

Ward, O., Aberson, M., Kirby, D., Chaverra, A., Roberts, A., Cross, K., Warner, I., AND Reach, I. (2022). Spatial assessment of benthic compensatory habitats for offshore wind farm impacts. NECR443. Natural England.