

Outer Dowsing Offshore Wind

Outline Plans

Outline Biogenic Reef Mitigation Plan

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Acronyms & Definitions

Abbreviations / Acronyms

Abbreviation / Acronym	Description
AEol	Adverse Effect on Integrity
ANS	Artificial Nesting Structure
CSIP	Cable Specification and Installation Plan
DCO	Development Consent Order
DDV	Drop Down Video
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
GT R4 Limited	The Applicant. The special project vehicle created in partnership between Corio Generation (a wholly owned Green Investment Group portfolio company), Gulf Energy Development and TotalEnergies
IDRBNR	Inner Dowsing, Race Bank and North Ridge
JNCC	Joint Nature Conservation Committee
MBES	Multibeam Echosounder
MMO	Marine Management Organisation
NERC	Natural Environment and Rural Communities
ODOW	Outer Dowsing Offshore Wind
ORCP	Offshore Reactive Compensation Platform
PEIR	Preliminary Environmental Impact Assessment
SAC	Special Area of Conservation
SSS	Side Scan Sonar

Terminology

Term	Definition
The Applicant	GTR4 Limited (a joint venture between Corio Generation (and its affiliates), TotalEnergies and Gulf Energy Development), trading as Outer Dowsing Offshore Wind
Array Area	The area offshore within which the generating station (including wind turbine generators (WTG) and inter array cables), offshore accommodation platforms, offshore transformer substations and associated cabling will be positioned, including the ORBA.
Baseline	The status of the environment at the time of assessment without the development in place.
Development Consent Oder (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment

	requirements of the EIA Regulations, including the publication of an Environmental Statement (ES).
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).
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Intertidal	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS)
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
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 (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 Platform (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
Onshore Infrastructure	The combined name for all onshore infrastructure associated with the Project from landfall to grid connection.
Outer Dowsing Offshore Wind	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.
Preliminary Environmental Information Report (PEIR)	The PEIR was written in the style of a draft Environmental Statement (ES) and provided information to support and inform the statutory consultation process during the pre-application phase.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
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.

1 Introduction

1.1 Project Background

1. GT R4 Limited (trading as Outer Dowsing Offshore Wind), hereafter referred to as the 'Applicant', is proposing to develop the Project. The Project array area will be located approximately 54km 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 and recreation of biogenic reef (if these compensation measures are deemed to be required by the Secretary of State) (see Volume 1, Chapter 3: Project Description (document reference 6.1.3) for full details.

1.2 Purpose of the Outline Biogenic Reef Plan

2. This outline plan has been prepared in response to feedback received from consultees, including Natural England, throughout the pre-application process. The purpose of this outline plan is to provide the framework for how potential impacts to *Sabellaria spinulosa* reef will be managed and mitigated during the design and pre-construction activities of the Project.
3. It is intended that this document will provide the basis for further discussions with relevant statutory advisors to agree the exact detail (timings, methodologies etc.) of the activities required. It should be noted that the final detailed plan will be produced post consent and submitted to the relevant authority for approval.
4. The document is structured as follows:
 - Introduction;
 - Consultation;
 - *Sabellaria spinulosa* presence within the Project Order Limits;
 - Mitigation measures;
 - Monitoring; and
 - Conclusions.

2 Consultation

5. This section within the plan will provide details of the consultation relevant to the mitigation of impacts on biogenic reef and how this has been addressed by the Project.

Table 2-1 Summary of consultation relating to biogenic reef mitigation

Date and consultation phase/type	Consultation and key issues raised	Response
Scoping Opinion (Marine Management Organisation (MMO), 26 August 2022) Comment ID: 3.2.6	The MMO advises that the ECC is routed to avoid designated sites that protect benthic features. If this is not feasible, then impacts on the protected benthic features within these sites should be minimised.	The development boundary selection was made following a series of constraints analyses, with the array area and offshore Export Cable Corridor (ECC) route selected to ensure the impacts on sensitive environmental receptors are minimised. However, the offshore ECC must pass through the Inner Dowsing, Race Bank and North Ridge (IDRBNR) Special Area of Conservation (SAC). Additional mitigation measures for Annex I biogenic reef habitat within the SAC and biogenic reef protected under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, are outlined in Section 4. This includes that windfarm infrastructure will be micro-sited around Annex I habitat (<i>S. spinulosa</i> reef) as far as practicable.
Marine Management Organisation Letter S42 response July 2023	Regarding the impact of temporary habitat disturbance during the construction phase, it is stated that preconstruction surveys of <i>S. spinulosa</i> reef (an Annex I habitat within the IDRBNR SAC) will be conducted, and that if this feature is present then a mitigation plan will be created in consultation with the MMO and Natural England (see sections 9.7.14	The Applicant acknowledges the concerns raised by MMO in relation to the detection of <i>S. spinulosa</i> reef. However, it is typical for well established 'reef' to be evident as irregular ridges and low-grade reef within mixed sediment is increasingly difficult to delineate. The Applicant undertook a high sampling strategy for the baseline characterisation ground-truth campaign.

Date and consultation phase/type	Consultation and key issues raised	Response
	<p>and 9.7.32 of the document cited in Volume 1, Chapter 9: Benthic and Intertidal Ecology (Document Reference 6.1.9) Rev V1.0. June 2023). As the data collected during the most recent geophysical surveys of the Array Area and ECC did not reveal a unique signature associated with <i>S. spinulosa</i> aggregations observed in the ground-truthing data (see section 9.4.107 of Volume 1, Chapter 9: Benthic and Intertidal Ecology (Document Reference 6.1.9). Rev V1.0. June 2023), it seems possible that potential <i>S. spinulosa</i> reef could go undetected in future geophysical surveys. The MMO advises that ODOW indicate how they will ensure that the pre-construction surveys will be able to identify any areas of potential <i>S. spinulosa</i> reef so that they can be avoided by micro-siting / routeing.</p>	<p>The evidence from that survey did reveal that <i>S. spinulosa</i> found was low-grade and patchy in nature, supporting the geophysical results. Furthermore, a reanalysis of the geophysical and benthic characterisation data along the offshore ECC has been undertaken by Envision Ltd (document reference 15.16), which has confirmed that there is no qualifying Annex I biogenic reef present within the offshore ECC. The Applicant has committed to pre-construction surveys to identify the quality and extent of <i>S. spinulosa</i> reef and enable robust micro-siting of infrastructure to occur.</p>
<p>Natural England response July 2023</p>	<p>S42 Natural England has concerns with the available baseline data used to assess the presence and extent of Annex I Biogenic reef within the IDRB NR SAC. We also have concerns with the use of the data sets and the reliance upon additional Annex I pre-construction surveys and as yet undiscussed potential mitigation measures to draw conclusions on the impacts of this project on Annex I reef. We would further note that there is a need have due regard to <i>S. spinulosa</i> reef outside of the designated site under Section 41 of the NERC Act 2006. We advise that the assumptions made by the Applicant to draw the conclusion of No</p>	<p>Well established <i>S. spinulosa</i> 'reef' is often evident as irregular ridges within geophysical data, whilst low grade <i>S. spinulosa</i> within mixed sediment is increasingly difficult to delineate in geophysical data. The Project undertook a high sampling strategy for the baseline characterisation ground-truth campaign. <i>S. spinulosa</i> that was found during surveys was low-grade and patchy in nature, supporting the geophysical results. Furthermore, a reanalysis of the geophysical and benthic characterisation data along the offshore ECC has been undertaken by Envision Ltd (document reference 15.16), which has confirmed that there is no</p>

Date and consultation phase/type	Consultation and key issues raised	Response
	AEol on Annex I reef features within IDRBNR and negligible impacts in EIA terms are not scientifically robust and require revisiting	qualifying Annex I biogenic reef present within the offshore ECC. The Project has committed to pre-construction surveys to identify the quality and extent of any <i>S. spinulosa</i> reef and enable robust micro-siting of infrastructure to occur. Due regard has also been given to <i>S. spinulosa</i> reef outside the SAC, as detailed within Section 4
Natural England response July 2023 S42	We welcome the proposal to microsite around potential Annex I habitat, however current proposals do not present enough evidence as to whether this would be achievable. Furthermore, the statement includes caveats of where practicable and where possible which causes concern. Given that the project has considered extension of the IDRBNR SAC in its without prejudice compensation document, the project should give greater consideration to the impacts it may have on suitable features located outside the IDRBNR SAC.	The Applicant has committed to avoid all known <i>S. spinulosa</i> reef within the IDRBNR SAC and outside the SAC, with this firm commitment possible due to the extensive site investigations and analyses undertaken to inform the Development Consent Order (DCO) application, combined with a consideration of the formation of <i>S. spinulosa</i> reef within the SAC from previous surveys. The Project undertook a high sampling strategy for the baseline characterisation ground-truth campaign. <i>S. spinulosa</i> that was found during surveys was low-grade and patchy in nature, supporting the geophysical results. Furthermore, a reanalysis of the geophysical and benthic characterisation data along the offshore ECC has been undertaken by Envision Ltd (document reference 15.16), which has confirmed that there is no qualifying Annex I biogenic reef present within the offshore ECC. A pre-construction Annex I habitat survey will be undertaken and will subsequently be used to help inform any micro-siting of windfarm infrastructure, as detailed within Section 4.

Date and consultation phase/type			Consultation and key issues raised	Response
Natural	England	S42	<p>Natural England are concerned with the statement the lack of unique SSS/MBES features associated with the <i>S. spinulosa</i> aggregations made it impossible to delineate the extent of the <i>Sabellaria</i> habitat within the ECC area. Ground truthing alone is not a sufficient method of understanding reef extent. To mitigate the risk to the Annex I biogenic reef from the project, particularly within the IDRBNR SAC, a thorough understanding of the extent of reef which may be impacted is required before any conclusions can be drawn and/or ensure mitigation measures such as micro-siting will be effective in avoiding impacts to Annex I reef.</p>	<p>The Applicant found that the geophysical data have shown that well established 'reef' is often evident as irregular ridges within the data. It was found that low grade <i>S. spinulosa</i> within mixed sediment is increasingly difficult to delineate within this data.</p> <p>The Applicant undertook a high sampling strategy for the baseline characterisation ground-truth campaign. <i>S. spinulosa</i> that was found during these surveys was low-grade and patchy in nature, supporting the geophysical results. Furthermore, a reanalysis of the geophysical and benthic characterisation data along the offshore ECC has been undertaken by Envision Ltd (document reference 15.16), which has confirmed that there is no qualifying Annex I biogenic reef present within the offshore ECC.</p> <p>The Applicant is committed to micro-siting infrastructure around Annex I habitat as far as practicable, to avoid where possible direct significant impacts on these sensitive habitats. A pre-construction Annex I habitat survey will be undertaken and will subsequently be used to help inform any micro-siting of windfarm infrastructure, as detailed within Section 4.</p>
Natural	England	S42	<p>We notice that MMO fishery byelaws have not been presented as a consideration within the PEIR. Please note that these areas are closed to benthic trawling and therefore potentially present areas where a designated feature might be present. The project will need to demonstrate that, where ECC transects</p>	<p>Whilst the ECC partially overlaps with an area to be managed as reef (as per the Joint Nature Conservation Committee (JNCC) dataset), no construction works will be undertaken within this area, thereby avoiding any impacts to the management of that area (section 4 of this document). Notwithstanding, it is notable that this</p>

Date and consultation phase/type	Consultation and key issues raised	Response
	fisheries closure areas that habitat feature restoration will not be hindered by cable installation, noting that there is an expectation that the extent of Annex I reef will increase as a result of the byelaw.	area was surveyed during the characterisation surveys and no reef was identified. Furthermore, a reanalysis of the geophysical and benthic characterisation data along the offshore ECC has been undertaken by Envision Ltd (document reference 15.16), which has confirmed that there is no qualifying Annex I biogenic reef present within the offshore ECC. A pre-construction Annex I habitat survey will be undertaken and will subsequently be used to help inform any micro-siting of windfarm infrastructure, as detailed within Section 4.
Natural England response July 2023 S42	Natural England welcomes the provision to return material dredged from within the SAC back within the site. However, we would like to note that this will need to be done carefully to avoid impacting Annex I biogenic reef habitat. The deposition site should be located in an area of similar particle size and upstream of the original deposition site at a time with suitable hydrological conditions to ensure that deposited sediment falls at least 50m from Annex I biogenic reef features. This should be considered in an Outline Cable Specification and Installation Management plan for inside and outside of designated sites and a Sandwave Levelling Assessment.	This is noted by the Project and has been considered within the Outline CSIP (document reference 8.5). The final location will be determined in consultation with the MMO and Natural England post-consent and will be informed by further site specific surveys and studies, including the sediment mobility study and relevant updates to that document as further site specific data becomes available.
Natural England response July 2023 S42	Please see our general comment on the adoption of what the project is calling a precautionary approach. We advise that, in this instance, a precautionary approach is required due to not being able to	The Project found that the geophysical data have shown that well established 'reef' is often evident as irregular ridges within the data. It was found that low grade <i>S. spinulosa</i> within mixed sediment is increasingly difficult

Date and consultation phase/type	Consultation and key issues raised	Response
	<p>delineate extent of reef within the PEIR boundary. To mitigate the risk to Biogenic reef from the project, particularly within the IDRBNR SAC, a thorough understanding of the extent of reef which may be impacted is required before any conclusions can be drawn and/or ensure mitigation measures such as micro-siting will be effective in avoiding impacts to Annex I reef.</p>	<p>to delineate within this data. The Project undertook a high sampling strategy for the baseline characterisation ground-truth campaign. <i>S. spinulosa</i> that was found during these surveys was low-grade and patchy in nature, supporting the geophysical results. Furthermore, a reanalysis of the geophysical and benthic characterisation data along the offshore ECC has been undertaken by Envision Ltd. (document reference 15.16), which has confirmed that there is no qualifying Annex I biogenic reef present within the offshore ECC. The Project confirm they have committed to pre-construction surveys to identify the quality and extent of <i>S. spinulosa</i> and enable robust micro-siting of infrastructure to occur.</p>
Evidence Plan Meeting ETG September 2023	<p>Natural England require the locations of reef extent to be able to ensure that the proposed micro siting mitigation measures are viable in the specific locations.</p>	<p>Due to the ephemeral nature of this species the Applicant has committed to pre-construction surveys to assess for Annex I biogenic reef, which if encountered at this stage would enable robust micro-siting of infrastructure to occur, as detailed within the Outline In Principle Monitoring Plan (Document Reference 8.3).</p>

3 Overview of the Potential Presence of Biogenic Reef

6. The Project Offshore ECC passes through the IDRBNR SAC. The Offshore ECC overlaps with 70.1km² of the SAC (8.3% of the total SAC) which is designated for “sandbanks covered by seawater at all times” and “biogenic reef”.
7. Biogenic reef created by the Ross worm *S. spinulosa* has consistently been recorded within the IDRBNR SAC. These reefs are known to support a variety of species including hydroids, sponges, bryozoans, anemones, as well as the commercial species European lobster *Homarus gammarus* and pink shrimp *Pandalus montagui*. Biogenic reefs formed by *S. spinulosa* allow colonisation by species not otherwise associated with the adjacent, looser sediment habitats.
8. The Project has undertaken site specific surveys within the offshore order limits. Geophysical survey data collection, followed by ground truthing using benthic grab samples and Drop Down Videos (DDV), has been completed for the Project ECC and array area.
9. Within the array area *S. spinulosa* was present at two stations but was not reef forming and unlikely to constitute ‘reef’ as detailed within Appendix 9.1: Benthic Ecology Technical Report (Array) (document reference 6.3.9.1). Within the ECC there was a lack of unique *S. spinulosa* feature signatures within the geophysical data which did not allow for the delineation of these features within the Order Limits as detailed in Appendix 9.2: Benthic Ecology Technical Report (ECC) (document reference 6.3.9.2). A further review of the Project specific data, alongside third party data sources, was undertaken by Envision (Appendix 9.5; document reference 6.3.9.5) which further concluded that there was no historical presence of *S. spinulosa* reef occurring within the offshore ECC or where the offshore ECC intersects with the IDRBNR SAC, based on the data reviewed within the Envision report.
10. A full reanalysis of the raw geophysical and benthic characterisation data along the offshore ECC has also been undertaken by Envision Ltd. (document reference 15.16), which has confirmed that there is no qualifying Annex I biogenic reef present within the offshore ECC.
11. Pre-construction surveys will be undertaken to further the understanding of the potential for *S. spinulosa* reef within the Project array and ECC.

4 Mitigation Measures

12. The Project has committed to a pre-construction biogenic reef survey which will subsequently be used to inform ~~any micro-siting of windfarm infrastructure. Following the outputs from the survey:~~ the following mitigation measures both within and outside the IDRBNR SAC.

Within the IDRBNR SAC

- Within the SAC, the Project will microsite infrastructure (including grabbed boulders) around areas of Annex I ~~biogenic reef:~~ *Sabellaria spinulosa* reef¹.
- ~~Outside the SAC, Project infrastructure (including grabbed boulders) will be micrositied around Annex I biogenic reef as far as practicable.~~
- As part of the routing design, a working separation distance (50 m buffer) will be maintained ~~where possible~~ from Annex I *Sabellaria spinulosa* reef¹ features to limit the potential for impacts to arise from direct damage/ sediment deposition.-
- The Project will ensure that no infrastructure is installed, and no ancillary works are to be undertaken within the defined Marine Management Organisation (MMO) Byelaw area within the SAC.

13. Furthermore, the Project has committed to the following in relation to dredge disposal ~~within the IDRBNR SAC:~~

- If any dredging of sediment for sandwave clearance is required within the IDRBNR SAC, the material removed from the IDRBNR SAC will be placed within the offshore ECC, within the IDRBNR SAC via a sediment return methodology suitable to ensure that material is returned within the same sediment cell, upstream of the original dredge location, using a precise disposal method via discharge pipe(s), downpipe(s) or equivalent.
- In the event that disposal of dredged sediment (associated with seabed preparation works or cable installation) is required, material will be deposited, upstream, within an area of similar sediment characteristics, in close proximity to the dredge location, in order to retain sediment within the sediment transport system.

Outside the IDRBNR SAC

- Outside the SAC, Project infrastructure (including grabbed boulders) will be micrositied around *Sabellaria spinulosa* reef¹ as far as practicable.
- As part of the routing design, a working separation distance (50 m buffer) will be maintained from *Sabellaria spinulosa* reef¹ features to limit the potential for impacts to arise from sediment deposition.

14. Furthermore, the Project has committed to the following in relation to dredge disposal:

¹ As defined by Gubbay, S. (2007) *Defining and managing Sabellaria spinulosa reefs: Report of an inter-agency workshop 1–2 May 2007*. JNCC Report No. 405. Peterborough: Joint Nature Conservation Committee. [data.jncc.gov.uk]

- In the event that disposal of dredged sediment (associated with seabed preparation works or cable installation) is required, material will be deposited, upstream, within an area of similar sediment characteristics, in close proximity to the dredge location, in order to retain sediment within the sediment transport system.

~~14.~~15. Further details of the commitments in relation to benthic ecology are detailed in Chapter 9: Benthic and Subtidal Ecology (document reference 6.1.9).

5 Monitoring

~~15.~~16. This section will outline the monitoring to be undertaken during the pre-construction phase to identify the presence and extent of any *S. spinulosa* reef within the Order Limits.

6 Conclusion

~~16.~~17. This outline Biogenic Reef Mitigation Plan sets out the principles by which potential impacts on biogenic reef will be managed and mitigated during the design and construction of the Project. The final Biogenic Reef Mitigation Plan to be submitted to the relevant authority for approval will be based on the principles set out within this outline plan.