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RENEWABLES



East Anglia ONE North Offshore Windfarm

Outline *Sabellaria* Reef Management Plan

Applicant: East Anglia ONE North Limited

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Applicable to East Anglia ONE North



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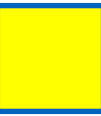


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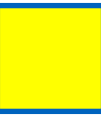
Glossary of Acronyms

AEZ	Archaeological Exclusion Zone
APP	Application Document Number
DML	Deemed Marine Licence
MMO	Marine Management Organisation
NE	Natural England
UXO	Unexploded Ordnance
WSI	Written Scheme of Investigation



Glossary of Terminology

Applicant	East Anglia ONE North Limited
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Generation Deemed Marine Licence (DML)	The deemed marine licence in respect of the generation assets set out within Schedule 13 of the draft DCO.
Inter-array cables	Offshore cables which link the wind turbines to each other and the offshore electrical platforms, these cables will include fibre optic cables.
Offshore cable corridor	This is the area which will contain the offshore export cables between offshore electrical platforms and landfall.
Offshore development area	The East Anglia ONE North windfarm site and offshore cable corridor (up to Mean High Water Springs).
Offshore electrical platform	A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore export cables	The cables which would bring electricity from the offshore electrical platforms to the landfall. These cables will include fibre optic cables.
Offshore infrastructure	All of the offshore infrastructure including wind turbines, platforms, and cables.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Platform link cable	Electrical cable which links one or more offshore platforms. These cables will include fibre optic cables.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water.
Transmission DML	The deemed marine licence in respect of the transmission assets set out within Schedule 14 of the draft DCO.

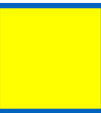


1.1 Introduction

1. This outline plan has been prepared in response to a number of comments received from Natural England (NE) and the Marine Management Organisation (MMO). Its purpose is to describe how *Sabellaria spinulosa* reef (“*Sabellaria* reef”) will be managed with regard to pre-construction activities and design of the East Anglia ONE North project (the Project).
2. This outline plan ~~will be~~ is secured through ~~a~~ condition [17\(1\)\(i\)](#) of the Generation Deemed Marine Licence (DML) and [condition 13\(1\)\(i\) of the Transmission DML](#) ~~and will be included in the updated draft Development Consent Order which will be submitted to the Examination at Deadline 3.~~
3. The document is structured as follows:
 - Current understanding and embedded mitigation
 - Additional mitigation
 - Micrositing Requirements
 - Activities restricted from *Sabellaria* reef areas
 - *Sabellaria* Reef Management Plan process
 - Process for managing conflicts including those between *Sabellaria* reef and archaeological exclusion zones (AEZ)

1.2 Current Understanding and Embedded Mitigation

4. The offshore development area of the Project does not overlap with any Special Areas of Conservation for which *Sabellaria* reef is a qualifying feature. However, *S. spinulosa* is found within the offshore development areas and *Sabellaria* reef, which is ephemeral in nature, may be present (see **Chapter 9 Benthic Ecology** (APP-057)).
5. As described in **section 9.3.3.2.1 of Chapter 9 Benthic Ecology** (APP-057), the Applicant ~~have~~ [has](#) committed to undertaking pre-construction surveys to determine the location and extent of any *Sabellaria* reef inside the area(s) within the Order Limits in which it is proposed to carry out construction works with the aim of mitigating impacts through avoidance where practicable. The requirement for these pre-construction surveys is secured within Condition 20 of the Generation DML and Condition 16 of the Transmission DML and in the ***In-Principle Monitoring Plan*** (APP-590) which is secured within Condition 17 of the Generation DML and Condition 13 of the Transmission DML.
6. The full methodology for the *Sabellaria* reef surveys, which will be based on the best practice approach of analysing geophysical data for potential *Sabellaria* reef areas, followed by ground-truthing by drop-down video (or grab samples where



visibility prevents confirmation by video), will be fully detailed in the Monitoring Plan (in accordance with the ***In-Principle Monitoring Plan*** (APP-590)) which will be submitted to the MMO for approval at least six months prior to the first survey.

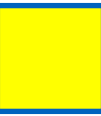
7. The results of the pre-construction surveys and evidence demonstrating avoidance of *Sabellaria* reef, where practicable, will be issued to the MMO as a requirement of the Design Plan a minimum of six months prior to commencement of construction activities as secured within Condition 17 of the Generation DML and Condition 13 of the Transmission DML.
8. Further details of the process steps in the *Sabellaria* Reef Management Plan are provided in **section 1.6**.

1.3 Additional Mitigation

9. Comments received from NE and the MMO in their relevant Representations highlighted concerns that the draft DML conditions relating to UXO clearance do not secure the mitigation of impacts on *Sabellaria* reef. Therefore, the Applicant has made the following commitment with regard to environmental micro-siting of UXO clearance activities which ~~will be~~ is now reflected in the ~~next version of the draft DCO which will be submitted into the Examination at Deadline 3.~~
10. The results of the pre-construction surveys and evidence demonstrating avoidance of *Sabellaria* reef where practicable will be issued to the MMO as an appendix to the UXO clearance Method Statement as secured within Condition 16 of the Generation DML and Condition 12 in the Transmission DML prior to UXO clearance activities being undertaken. ~~The Applicant intends to amend the UXO clearance conditions in the DMLs to require environmental micro-siting to be included in the Method Statement for UXO clearance. The conditions will also be amended to require submission of the UXO clearance Method Statement at least three months prior to UXO clearance activities being undertaken.~~
11. Further details of the process steps in the *Sabellaria* Reef Management Plan are provided in **section 1.6**.

1.4 Micro-siting Requirements

12. Should *Sabellaria* reef be identified inside the area(s) within the Order limits in which it is proposed to carry out UXO clearance activities and construction works, micro-siting would be undertaken by implementing a buffer between the UXO to be cleared or construction works and the edge of the reef. Ordtek (2018) calculated a crater diameter of 21m (radius of 10.5m) for a UXO size of 700kg (net explosive quantity (NEQ)), which is the largest UXO expected to be encountered. For the purpose of UXO detonation, a buffer width of 60m will be implemented. For all other construction activities, a buffer width of 50m will be applied. However, the Applicants would like to retain the ability to



discuss reef buffer requirements on a case by case basis during the pre-construction period, where for example the proximity of several reefs makes micro-siting with a minimum 50m buffer (or 60m for UXO clearance) challenging.
~~through liaison between the Project's Consent Compliance Team and Engineering Team to avoid the *Sabellaria* reef and provide an appropriate buffer where practicable. An appropriate buffer will be agreed with the MMO through the final *Sabellaria* Reef Management Plan and will be based on the latest science and best practice.~~

1.5 Activities Restricted from *Sabellaria* Reef Areas

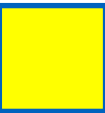
13. In addition to the micro-siting requirements noted above, the following activities will not be undertaken within *Sabellaria* reef areas and appropriate buffer where this is practicable:
- UXO detonation;
 - Relocation of boulders;
 - Pre-lay grapnel run;
 - Sand wave levelling (and subsequent sediment disposal);
 - Cable burial (whether ploughing, jetting or trenching);
 - Vessel anchoring;
 - Seabed preparation for foundations; and
 - Location of foundations and cable scour protection.
14. Where such activities require to be undertaken within *Sabellaria* reef areas and/or the appropriate buffer, this will be detailed within the ~~final~~ *Sabellaria* Reef Management Plan process together with appropriate management measures that will be undertaken, ~~and as discussed in Section 1.6 below.~~

1.6 *Sabellaria* Reef Management Plan Process

15. This section presents an outline of the process steps for implementing the *Sabellaria* Reef Management Plan and the actions that will be taken. This section of the final *Sabellaria* Reef Management Plan process will be updated with activity timescales post-consent ~~in the final *Sabellaria* Reef Management Plan~~ once further project details are available and would be further revised through facilitatory meetings/workshops and iterative submissions of the Plan and re-issued if conflicts with *Sabellaria* reefs arise (discussed in Section 1.7).

Table 1.1 Sabellaria reef management plan process

Step	Process activity	Relevant DML conditions
Monitoring Plan and Sabellaria Reef Management Plan (anticipated to be submitted in parallel)		
1.1	Submit the Monitoring Plan, in accordance with the IPMP, with the full methodology and programme for Sabellaria reef survey and identification to MMO for approval, in consultation with Natural England , at least six months prior to commencement of the first pre-construction survey. <u>During preparation of the Monitoring Plan Natural England will be consulted.</u>	Condition 17(1)(c) Generation DML; Condition 13(1)(c) Transmission DML
1.2	<u>Consult with Natural England during the preparation of the final Sabellaria Reef Management Plan (which will be in accordance with this outline Sabellaria Reef Management Plan) and</u> Submit the Sabellaria Reef Management Plan <u>this in accordance with this Outline Sabellaria Reef Management Plan</u> to MMO for approval, in consultation with Natural England , at least six months prior to commencement of the pre-construction geophysical survey described in the Monitoring Plan in Step 1.1	<u>Condition 17(1)(i) Generation DML;</u> <u>Condition 13(1)(i) Transmission DML</u> To be secured in the updated Draft DCO submitted at Deadline 3
2	Undertake geophysical survey to inform engineering design options and analyse results for potential Sabellaria reefs (and other potential constraints such as archaeology). Undertake ground-truthing of potential Sabellaria reefs through drop-down video (or grab sample where visibility prevents confirmation through video) against the methodology agreed with the MMO, in consultation with Natural England , in Step 1.1	Condition 20(2)(a) Generation DML; Condition 16(2)(a) Transmission DML
3	Enter locations of confirmed Sabellaria reef into a project environmental constraints database to prevent impacts on Sabellaria reefs where practicable from the activities described in Section 1.5	n/a
4	Design the windfarm avoiding Sabellaria reefs where practicable. Where conflicts occur, consult with MMO, Natural England and Historic England <u>through an updated Sabellaria Reef Management Plan and meeting(s) / workshop(s)</u> (see Section 1.7)	n/a
5	Submit the UXO clearance Method Statement (containing the Sabellaria reef survey report describing the Sabellaria reefs identified and how these have been avoided) to the MMO for approval, <u>in consultation with Natural England</u> , a minimum of three months prior to UXO clearance activities being undertaken.	Condition 16(1)(a) <u>and (3)</u> Generation DML; Condition 12(1)(a) <u>and (3)</u> Transmission DML <i>Inclusion of environmental micro-siting requirements and timing of discharge document submission to be secured in the updated Draft DCO submitted at Deadline 3</i>
6	Submit the Design Plan (containing the Sabellaria reef survey report describing the Sabellaria reefs identified and how these will be avoided, where practicable, during the construction activities) to the MMO for approval, in consultation with Natural England , a minimum of six months prior to planned commencement of construction.	Condition 17(1)(a) Generation DML; Condition 13(1)(a) Transmission DML



Step	Process activity	Relevant DML conditions
	During preparation of the Design Plan Natural England will be consulted. It is anticipated that in discharging the aforementioned Design Plan conditions, the <i>Sabellaria</i> reef report submitted to discharge UXO clearance would be cross-referenced / re-submitted alongside diagrams describing the windfarm design and how <i>Sabellaria</i> reefs have been avoided where practicable	

1.7 Process for Managing Reef / Archaeological Exclusion Zone (AEZ) Conflicts

16. Throughout this outline *Sabellaria* Reef Management Plan, the Applicant has reinforced the commitments made in the ES and secured in the draft DCO and has^{ve} provided an outline process by which mitigation of any *Sabellaria* reefs identified in pre-construction surveys will be managed. There may however be instances where it is not possible or practicable to avoid *Sabellaria* reef, such as:

- Identification of a *Sabellaria* reef in pre-construction surveys that has the potential to significantly impact construction of the Project. For example, the identification of a *Sabellaria* reef bisecting the order limits of the export cable corridor and preventing the export cables from connecting the offshore substations and the landfall; and
- Conflicts between *Sabellaria* reefs and archaeological exclusion zones (AEZ) where the location and proximity of a number of *Sabellaria* reefs and AEZs significantly impact on the design of the Project.

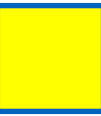
17. The following sections outline how such conflicts will be managed.

1.7.1 Mechanism to Avoid Conflicts

18. The primary means of preventing impacts to *Sabellaria* reef and archaeological interests is through avoidance during design of the Project.

1.7.2 Management of Conflicts Between Design of the Project and *Sabellaria* Reefs

19. In the event of a scenario where a *Sabellaria* reef(s) is identified as having a significant impact on design of the Project, such as the example given above where a *Sabellaria* reef is found bisecting the order limits of the export cable corridor and preventing the export cables from connecting the offshore substations and the landfall, the Applicant would raise the issue to the MMO and NE [through an updated *Sabellaria* Reef Management Plan](#) and engage on resolution options. It is anticipated that consideration of the issue would take a hierarchical approach and consider the following:



- Is the *Sabellaria* reef contiguous or are there areas within it that support the *S. spinulosa* biotope but do not meet the criteria of reef?
- Assuming the *Sabellaria* reef is contiguous, are there areas where the quality of the *Sabellaria* reef is lower where it may be permissible to route offshore electrical cables or install foundations, for example at its periphery?
- Are there sufficient data to apply the principles of the 'core reef' approach (Bussell and Saunders, 2010; Roberts *et al.*, 2016) and would that be an acceptable solution if such an approach identified areas not meeting the principles of 'core reef'.

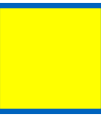
20. [Should it be necessary and permissible to route a cable through *Sabellaria* reef, the use of cable protection is to be avoided. However, it is anticipated that the sandy sediments that support *Sabellaria* reefs would not prevent successful cable burial, negating the need for cable protection.](#)

1.7.3 Management of Conflicts Between *Sabellaria* Reef and Archaeology

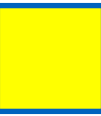
21. In the event of a scenario where the design of the Project is impacted by the presence of *Sabellaria* reefs and archaeology (with existing or requiring implementation of AEZs) there are a number of options that could be considered. As with the 'reef alone' scenario discussed above, consideration of conflict resolution is anticipated to be based on a hierarchical approach which may consider the following:
- Can the archaeology be relocated or recovered? There are precedents for relocation and recovery and a relevant example is the East Anglia ONE project where the statutory historic body, Historic England, allowed for the relocation of several archaeological artefacts. However, the potential for relocation or recovery is very dependent on the nature of the archaeology and would require full consultation with Historic England.
 - Where the archaeology cannot be relocated or recovered, the options listed above for 'reef alone' would be considered.
22. The Applicant considers that decisions will need to be made on a case-by-case basis and that adopting a hierarchical approach may be appropriate whereby the importance of particular archaeological interests together with the quality of the *Sabellaria* reef and any local biodiversity that it supports are weighed against each other to inform the appropriate course of action, in consultation with the MMO, Natural England and Historic England.

1.8 Conclusion

23. This outline *Sabellaria* Reef Management Plan sets out the principles by which *Sabellaria* reef will be managed and impacts on *Sabellaria* reef mitigated during



the design and construction of the Project. The final *Sabellaria* Reef Management Plan to be submitted to the MMO for approval in accordance with the conditions of the DMLs will be based on the principles set out within this outline plan.



1.9 References

Bussell, J., Saunders, I. (2010). An appraisal and synthesis of data identifying areas of ross worm, *Sabellaria spinulosa*, reef in The Wash. Natural England internal document.

Roberts, G., Edwards, N., Neachtain, A., Richardson, H. & Watt, C. (2016). Core reef approach to *Sabellaria spinulosa* reef management in The Wash and North Norfolk Coast SAC and The Wash approaches. Natural England Research Reports, Number 065.

[Ordtek \(2018\). Technical Note 01 Strategic Unexploded Ordnance \(UXO\) Risk Management – Seabed Effects During Explosive Ordnance Disposal \(EOD\). Available from https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010079/EN010079-001533-Appendix%2005.02%20Norfolk%20Vanguard%20Detonation%20Effects%20of%20UXO.pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010079/EN010079-001533-Appendix%2005.02%20Norfolk%20Vanguard%20Detonation%20Effects%20of%20UXO.pdf)