



Marubeni



Appendix 25: Scour Protection Management Plan

Array EIA Report

2024

Revision	Comments	Author	Checker	Approver
FINAL	Final	Ossian OWFL	RPS	RPS

Approval for Issue		
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1. INTRODUCTION

1.1. PURPOSE OF THIS DOCUMENT

1. This outline Scour Protection Management Plan (SPMP) has been prepared by RPS and Ossian Offshore Wind Farm Limited (Ossian OWFL), a joint venture partnership between SSE Renewables (SSER) Limited, Copenhagen Infrastructure Partners, and Marubeni Corporation (hereafter referred to as 'the Applicant'), to support the offshore Environmental Impact Assessment (EIA) Report for the Ossian Array (hereafter referred to as 'the Array') (Figure 1.1).
2. The purpose of the SPMP is to outline the key principles of managing the protection of wind turbine and offshore substation platform (OSP)/offshore converter station platform foundations/anchors, from the effects of scour and hazards (e.g. snagging of anchors), immediately following construction and during the operation and maintenance phase of the Array. Any protection laid as part of the Array has the potential to scour, which can be described as the movement of sediment that can erode the seabed around a fixed structure.
3. This SPMP has been developed taking into account feedback provided from consultees as part of the Ossian Array Scoping Opinion (Marine Directorate - Licensing Operations Team (MD-LOT), 2023), where it was highlighted that management plans should be "adequate" to be used as mitigation measures where they are key to reducing impacts. Table 1.1 provides a summary of the issues raised by stakeholders in relation to scour protection.
4. This SPMP is a 'live' document and as such it will be further developed post-consent in consultation with regulatory bodies and stakeholders such as MD-LOT, Marine Directorate Science, Evidence, Data and Digital (MD-SEDD) (formerly Marine Scotland Science (MSS)) and NatureScot, once project design has been finalised.

7. A geophysical survey of the Array area was conducted between March 2022 and July 2022 and geotechnical surveys were completed in August 2023 and November 2023. There will be ongoing geotechnical and geophysical surveys as required throughout the pre-construction and operation and maintenance phases.
8. Bathymetry within the Array area varies between the maximum water depth recorded as 88.7 m relative to Lowest Astronomical Tide (LAT), and the shallowest area was recorded at 63.8 m LAT.
9. The Array EIA Report states that the type and volume of scour protection required will vary depending on the various wind turbine anchoring options and offshore platform options considered, and the final parameters will be decided once the design of these is finalised.

Table 1.1: Issues Raised by Consultees in Relation to Scour Protection

Issues Raised	Stakeholder	Where Issues are Addressed in the Array EIA Report
Use of scour protection must be assessed in the EIA, including detail of materials, quantities, and location.	MD-LOT	Volume 2, chapter 7
Requested inclusion of a Scour Protection Management Plan.	NatureScot	Volume 4, appendix 21, Annex C.

1.2. BACKGROUND

5. The Array includes the following components:
 - floating wind turbines;
 - mooring and anchoring systems for each floating foundation;
 - connectors and ancillaries for mooring and anchoring systems, including buoyancy elements and clump weights;
 - offshore substation platforms (OSPs);
 - inter-array cables; and
 - inter-connector cables.
6. A full description of the Array is provided in volume 1, chapter 3. However, the detailed and final design of the Array will be determined post-consent.

2. FOUNDATION SCOUR PROTECTION

10. Physical processes at the Array will influence the effects of scour upon floating wind turbine anchor and mooring systems, OSP foundations and inter-array and interconnector cables. Therefore, depending on metocean conditions, scour protection may be required around offshore infrastructure to protect against currents and waves that may cause erosion of the seabed.
11. The process for developing the scour protection design will follow the below steps:
 - design of Scour protection:
 - pre-construction surveys to inform concept design;
 - front-End Engineering Design (FEED) design studies; and
 - full Invitation to Tender (ITT) to produce detailed design of scour protection.
 - completion of pre-installation surveys (e.g. geophysical surveys), to inform preparation of the SPMP;
 - production of detailed SPMP for submission and approval by MD-LOT prior to construction;
 - post installation surveys to confirm scour protection installation, as deemed necessary; and
 - survey of assets including scour protection may be undertaken periodically during the operation and maintenance phase of the project, if deemed necessary. The timing and frequency of any surveys will be determined post construction and will be informed by previous asset surveys.
12. Scour protection material may be required at floating wind turbine anchor and mooring systems and OSP foundations, during the construction phase, to mitigate the effects of scour, and to minimise the release of suspended sediments, and the potential for seabed level changes in the vicinity of the wind turbine anchors. The maximum design scenario for scour protection required at the Array is provided in volume 1, chapter 3 (Table 3.15 and Table 3.16) and volume 2, chapters 7, 8 and 9 of the Array EIA Report.
13. As detailed in volume 1, chapter 3 (Table 3.15), the most frequently used scour protection method is rock placement. However, there is potential for other methods to be used, including concrete mattresses.
14. The final quantities and extent of scour protection will be dependent on current speed, sediment type and the anchoring option, thus final quantities will be determined post construction. However, Table 2.1 provides the maximum design scenario for scour protection likely to be required, based on the information provided in volume 1, chapter 3 of the Array EIA Report.

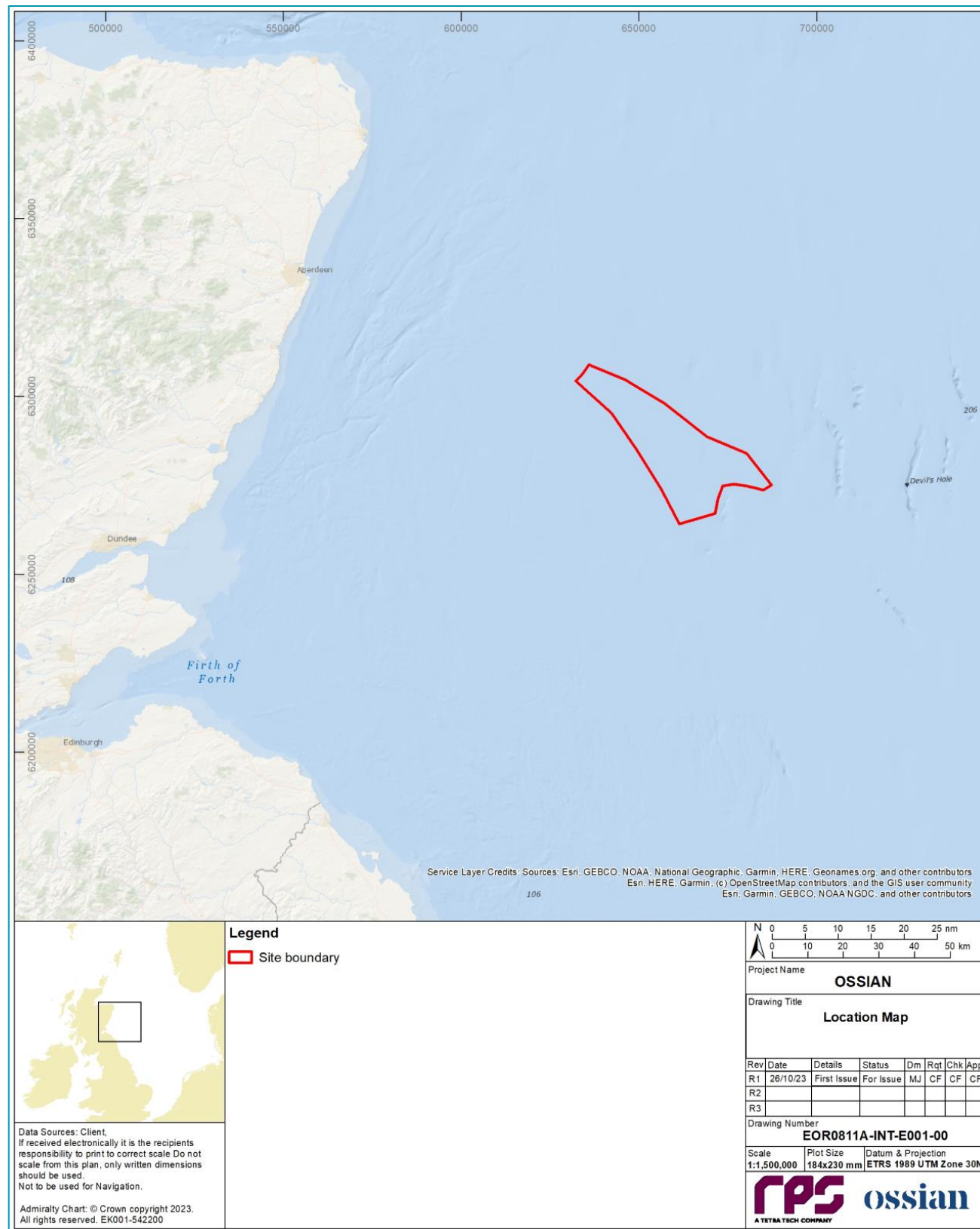


Figure 1.1: Location of the Array

Table 2.1: Maximum Design Scenario for Scour Protection

Foundation	Maximum Area of Scour Protection Per Foundation (Excluding Pile/Anchor Area) (m ²)	Maximum Volume of Scour Protection Per Foundation (m ³)	Maximum Volume of Scour Protection for Array (m ³)
Anchoring option 1 – Driven piles	3,436	5,368	948,295
Anchoring option 3 – Driven piles and DEAs	1,918	3,489	616,392
Anchoring option 4 – Driven piles and suction anchors	8,171	12,767	2,225,420
Anchoring option 5 – Shared driven piles	2,405	3,757	663,807

18. Detailed requirements for scour and cable protection will be agreed post-consent as part of the final SPMP and CBRA which will be submitted to MD-LOT for approval prior to construction.

3. SCOUR ASSESSMENT IN ARRAY EIA REPORT CHAPTERS

15. The Array EIA Report has assessed the potential impacts relating to the presence of scour protection during the operation and maintenance phase of the Array. These assessments have been carried out based on the maximum design relevant to a given potential impact, drawing specific details from volume 1, chapter 3.
16. Table 3.1 details where in the Array EIA Report these impacts have been considered.

Table 3.1: Impacts Relating to Scour

Offshore EIA Chapter	Impacts Considered
Volume 2, chapter 7	Increase in SSCs and associated deposition and sediment transport due to operation and maintenance activities.
Volume 2, chapter 8	<ul style="list-style-type: none"> • Long term habitat loss and disturbance. • Colonisation of hard structures. • Effects to benthic subtidal ecology due to removal of hard substrates. • Increased risk of introduction and spread of invasive non-native species (INNS).

4. SUMMARY

17. Details relating to scour and cable protection have been provided in volume 1, chapter 3 and potential impacts have been assessed in the relevant chapters of the Array EIA Report (Table 3.1). Some flexibility is required in terms of type and quantity of scour and cable protection during the pre-application phase, therefore the assessments have been carried out on a maximum design scenario basis.

5. REFERENCES

MD-LOT (2023). *Scoping Opinion for Ossian Array*. Marine Directorate – Licensing Operations Team. Edinburgh.

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