Muir Mhòr Offshore Wind Farm

Environmental Impact Assessment Report

Volume 3, Appendix 6.3: Offshore Transboundary Effects

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Glossary

Term	Definition
Array Area	The area in which the generation infrastructure (including Wind Turbine Generators and associated foundations and inter-array cables), Offshore Electrical Platform(s), and an interconnector cable will be located.
Developer	Muir Mhòr Offshore Wind Farm Limited
EEA state	The European Economic Area includes states within the European Union and three additional states: Iceland, Liechtenstein and Norway.
EIA Regulations	Collectively the term used to refer to The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, The Marine Works (Environmental Impact Assessment) Regulations 2007, and The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017.
Habitats Regulations	The Conservation (Natural Habitats, &c..) Regulations 1994, the Conservation of Offshore Marine Habitats and Species Regulations 2017 and the Conservation of Habitats and Species Regulations 2017
Inter-array cables	Cables which link the wind turbines generators to each other and the Offshore Electrical Platform(s).
Interconnector cable	Cable which links the Offshore Electrical Platform(s) to one another, allowing for power to be transferred between the platforms.
Offshore Electrical Platform (OEP)	Offshore platform consisting of High Voltage Alternating Current (HVAC) equipment, details depending on the final electrical set up of the Project.
Offshore Export Cable Corridor (ECC)	The area within which the offshore export cables will be installed.
Offshore export cables	The subsea electricity cable circuits running from the Offshore Electrical Platform(s) to the landfall which will transmit the electricity generated by the offshore wind farm to the onshore export cables for transmission onwards to the onshore substation and the national electrical transmission system along with auxiliary cables such as fibre optic cables.
Project	Muir Mhòr Offshore Wind Farm – comprises the wind farm and all associated offshore and onshore components.
Proposed Development	The offshore Muir Mhòr Offshore Wind Farm project elements to which this Offshore EIA Report relates.
Transboundary effects	Transboundary effects arise when impacts from a development within one EEA state's territory significantly affects the environment of another EEA state(s).
Wind Turbine Generator (WTG)	The wind turbines that generate electricity consisting of tubular towers and blades attached to a nacelle housing mechanical and electrical generating equipment.

Acronyms

Term	Definition
CCR	Climate Change Resilience
COP	Conference of the Parties to the United Nations Framework Convention on Climate Change
ECC	Export Cable Corridor
EEA	European Economic Area
EEZ	European Exclusion Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Field
EU	European Union
GHG	Greenhouse Gas
GVA	Gross Value Added
HRA	Habitats Regulations Appraisal
ICCI	In-Combination Climate Change Impact
INTOG	Innovation and Targeted Oil and Gas
IOU	Infrastructure and Other Users
km	Kilometre
LSE	Likely Significant Effects
MCA	Maritime and Coastguard Agency
MD-LOT	Marine Directorate - Licensing Operations Team
MSL	Mean Sea Level
MW&SQ	Marine Water and Sediment Quality
NERL	NATS (En-Route) plc
nm	Nautical miles
OEP	Offshore Electrical Platforms
O&M	Operation and Maintenance
PINS	Planning Inspectorate
PSR	Primary Surveillance Radar
PTS	Permanent Threshold Shift
RIAA	Report to Inform Appropriate Assessment
RYA	Royal Yachting Association
SAR	Search and Rescue
SLVR	Seascape, Landscape and Visual Resources
SPA	Special Protection Area
SSC	Suspended Sediment Concentration
TLP	Tension Leg Platform
UK	United Kingdom
UNECE	United Nations Economic Commission for Europe
UXO	Unexploded Ordnance
WTG	Wind Turbine Generators

1. INTRODUCTION

1.1. OVERVIEW

1.1.1. Muir Mhòr Offshore Wind Farm Limited (hereafter referred to as 'the Developer') is proposing to develop the Muir Mhòr Offshore Wind Farm (hereafter 'the Project'). The Project is made up of both offshore and onshore components. The subject of this offshore Environmental Impact Assessment Report (EIAR) is the offshore infrastructure of the Project seaward of Mean High-Water Springs (MHWS) which is hereafter referred to as 'the Proposed Development'.

1.1.2. The Muir Mhòr array area covers an area of approximately 200 km^2 and is located approximately 63 km east of Peterhead on the east coast of Scotland. The offshore infrastructure of the Proposed Development includes Wind Turbine Generators (WTGs) and associated floating foundations, the Offshore Electrical Platform (OEP) and associated foundations, the inter-array cables, interconnector cable, offshore export cables and landfall.

1.1.3. Offshore transboundary effects could occur when there is an impact from the Proposed Development that has the potential to significantly affect an environment within another European Economic Area (EEA) state(s). It has been described, in Marine Scotland Consenting and Licensing Guidance for Offshore Wind, Wave and Tidal Energy Applications (2018)[1], that transboundary impacts are likely to relate to:

- Projects that may have an impact on mobile species; and
- Where projects are close to national boundaries or areas administered by other relevant authorities.

1.1.4. This technical report has considered the likely spatial extent of potential impacts during the construction, Operation and Maintenance (O&M) and decommissioning of the Proposed Development and presents the outcomes of the transboundary screening exercise in Section 3. Section 3 also presents instances where no potential transboundary impacts have been identified via this transboundary screening process, and these are set out in Table 3-2 and Table 3-3.

1.1.5. This report reviews the significance of transboundary effects that may arise due to the Proposed Development. It spatially analyses potential transboundary impacts associated with construction, O&M, and decommissioning phases, and determines their inclusion into the Proposed Development's Environmental Impact Assessment (EIA) process.

1.1.6. The aim of this technical report is to inform the Scottish Minister's evaluation of the likelihood of transboundary effects associated with the Proposed Development, and the potential need for transboundary consultation with EEA states.

[1] Marine Scotland changed name to Marine Directorate in 2023.

1.2. RELEVANT LEGISLATION

1.2.1. The United Nations Economic Commission for Europe (UNECE) Convention on EIA presents guidance on assessment of transboundary effects in a Transboundary Context (the 'Espoo Convention') (as amended). The aim is to promote "environmentally sound and sustainable development", while enhancing "international co-operation in assessing environmental impact in particular in a transboundary context" (UNECE, 2017).

1.2.2. Where an activity occurring in one qualifying country has the potential for a significant effect in another qualifying country, EIAs are required to consider potential impacts across national borders, in accordance with the Espoo Convention. The UK is a signatory of The Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (the 'Aarhus Convention'). The Aarhus Convention protocol gives individuals the right to access information, public participation in decision-making and access to justice in environmental matters.

1.2.3. The European Union (EU) Directive 85/337/EEC (as amended) (the EIA Directive) implements the Espoo and Aarhus Conventions in EU states. The Marine Works (Environmental Impact Assessment) Regulations 2007, the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 transpose this Directive into UK law.

1.2.4. Procedures for consultation for developments with potential for significant transboundary impacts are set out in the UK Planning Inspectorate (PINS) Advice Note 12: Transboundary Impacts' (PINS, 2020) which advises developers to:

- Provide information to the competent authority about the potential for transboundary effects as part of the suite of documents accompanying the application for development consent;
- Consider whether to undertake their own consultation with governmental divisions and interest groups within relevant EEA states and/or other relevant states that are parties to Espoo or Aarhus Conventions; and
- Organise and meet the costs of translating documents if a reasonable request for translation is made.

1.2.5. Advice Note 12 has been prepared by PINS so it is therefore not directly applicable under Scottish consenting regimes, however it has been used to inform this transboundary screening appendix.

1.2.6. Further details of legislation and policy can be found in Volume 1, Chapter 2 (Legislation and Policy.

ENVIRONMENTAL IMPACT ASSESSMENT

1.2.7. There is a requirement for Scottish Ministers, under the EIA Regulations, to make a determination of whether a Proposed Development is likely to have significant impacts on the receiving environment of an EEA state – i.e. a "transboundary impact". Regulation 18 (1)(a) of the Marine Works (Environmental Impact Assessment) Regulations 2007 states that where:

> *"it comes to the attention of the appropriate authority that a proposed project is the subject of an environmental impact assessment and is likely to have significant effects on the environment in an EEA State"*

Scottish Ministers are required to:

- Send to the EEA state as soon as possible and no later than their date of publication in the relevant Gazette the particulars mentioned in paragraph (3) of the Regulation 18 of the Marine Works (Environmental Impact Assessment) Regulations 2007 (and paragraph 5 if required);
- Publish, or direct that the Applicant publish, the information in a notice placed in the relevant Gazette, indicating the address where further information is available; and
- Give the EEA state a reasonable period of time in which to indicate whether it wishes to participate in the procedure for which these Regulations provide.

1.2.8. The information required to be shared with EEA states includes:

- A description of the project, together with any available information on its possible significant effect on the environment in an EEA state; and
- Information on the nature of the decision which may be taken.

1.2.9. The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 have similar provisions regarding transboundary consultation at Regulation 29, as do the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 at Regulation 30.

HABITATS REGULATIONS APPRAISAL (HRA)

1.2.10. The Habitats Regulations state that a Habitats Regulations Appraisal (HRA) must be carried out on any plans and projects which could affect sites designated for supporting habitats or species of international importance (listed on the Annexes of the Habitats Directive and Birds Directive) and hereafter specified for protection within schedules to the Habitats Regulations (as amended).

1.2.11. Designated sites within EU member states are known as Natura 2000 Sites. Within the UK, these designated sites are part of the National Site Network.

1.2.12. The Report to Inform Appropriate Assessment (RIAA) (Muir Mhòr Offshore Wind Farm Limited, 2024) for the Proposed Development is required to provide the required information in relation to potential transboundary impacts where Scottish Ministers are required to undertake an appropriate assessment of a project in relation to designated sites associated with proposed project-alone and associated cumulative effects, including transboundary and cross border effects. It is also a requirement that Scottish Ministers consult with the relevant EEA states to discuss the potential transboundary impacts identified.

2. CONSULTATION

2.1.1. Where a development is likely to have transboundary effects, an EEA state must be consulted on the transboundary assessment of said development by the Scottish Ministers once the EEA state has confirmed that they wish to participate in discussion. It is proposed that the following EEA states should be consulted on whether they intend to participate:

- Norway;
- Denmark;
- Germany; and
- Netherlands.

2.1.2. The participation of these EEA states is recommended based on the potential for transboundary impacts on shipping and navigation and commercial fisheries as discussed in Section 3 below.

2.1.3. To inform the EIAR, the Developer has undertaken thorough pre-application consultation process. Table 2-1 summarises the key issues raised during consultation for the Proposed Development in relation to transboundary impacts, including those raised in the Scoping Opinion (Marine Directorate - Licensing Operations Team (MD-LOT), 2023), and how these have been addressed in the EIAR. Volume 1, Chapter 5 (Consultation) details the consultation activities undertaken for the Proposed Development.

Table 2-1 Pre-application consultation related to potential offshore transboundary effects from the Proposed Development

Date	Consultee and Type of Response	Topic	Consultation	Response to Issue Raised and/or where considered in EIA and HRA
September 2023	MD-LOT, Scoping Opinion	Marine and Coastal Processes	The Scottish Ministers agree that transboundary impacts [in relation to Marine and Coastal Processes] can be scoped out from further consideration.	Noted and agreed. Transboundary impacts for Marine and Coastal Processes are screened out of the transboundary impact assessment (see Section 3.2 of this report).
September 2023	MD-LOT, Scoping Opinion	Benthic Subtidal and Intertidal Ecology	The Scottish Ministers agree that transboundary impacts in relation to Benthic Subtidal and Intertidal Ecology can be scoped out from further consideration.	Noted and agreed. Transboundary impacts for Benthic, Subtidal and Intertidal Ecology are screened out of the transboundary impact assessment (see Section 3.2 of this report).
September 2023	MD-LOT, Scoping Opinion	Fish and Shellfish Ecology	The Scottish Ministers are content with the proposal to screen out transboundary impacts [in relation to fish and shellfish ecology].	Noted and agreed. Transboundary impacts for Fish and Shellfish Ecology are screened out of the transboundary impact assessment (see Section 3.2 of this report).
September 2023	MD-LOT, Scoping Opinion	Offshore Ornithology	In regard to transboundary impacts [in relation to offshore ornithology], the Scottish Ministers highlight the NatureScot representation and advise further consideration will be required following the consideration of the final baseline report.	Considered in Volume 2, Chapter 11 (Offshore and Intertidal Ornithology) and discussed in Section 3.2 of this report.
September 2023	MD-LOT, Scoping Opinion	Marine Mammals	The Scottish Ministers are content with the proposed approach to the assessment of transboundary impacts [in relation to marine mammals]. The Scottish Ministers refer the Developer to NatureScot comments regarding consideration being required to transboundary and cross border impacts for certain cetacean species, but not for seal species due to existing marine mammal management units and highlight the further advice available from NatureScot once the initial impact assessment has been completed.	Considered in Volume 2, Chapter 12 (Marine Mammals) and discussed in Section 3.2 of this report.

Date	Consultee and Type of Response	Topic	Consultation	Response to Issue Raised and/or where considered in EIA and HRA
September 2023	Maritime and Coastguard Agency (MCA), Scoping Opinion Consultation Response	Shipping and Navigation	The MCA agree with the assessment of the potential transboundary effects in relation to shipping and navigation.	Considered in Volume 2, Chapter 14 (Shipping and Navigation) and discussed in Section 3.3 of this report.
September 2023	Marine Directorate – Renewables and Ecology Team, Scoping Opinion Consultation Response	Marine and Coastal Processes	The Marine Directorate – Renewables and Ecology Team agree with the assessment of the potential for transboundary effects in relation to marine and coastal processes.	Considered in Volume 2, Chapter 7 (Marine and Coastal Processes) and discussed in Section 3.2 of this report.
September 2023	NatureScot, Scoping Opinion Consultation Response	Offshore Ornithology	NatureScot notes the proposed approach to transboundary impacts [for offshore ornithology] and the conclusion that transboundary effects may only arise during non-breeding season. NatureScot recommend further consideration of this topic following submission of the final baseline report.	Considered in Volume 2, Chapter 11 (Offshore and Intertidal Ornithology) and discussed in Section 3.2 of this report.
September 2023	NatureScot, Scoping Opinion Consultation Response	Marine Mammals	NatureScot agree with the proposed approach to the assessment of transboundary impacts [for marine mammals]. Consideration may need to be given to transboundary and cross border impacts for certain cetacean species, but not for seal species due to existing marine mammal management units. Once initial impact assessment has been carried out, NatureScot can provide further advice on this aspect.	Considered in Volume 2, Chapter 12 (Marine Mammals) and discussed in Section 3.2 of this report.
September 2023	NatureScot, Scoping Opinion Consultation Response	Benthic Subtidal and Intertidal Ecology	NatureScot agree that transboundary impacts in relation to benthic subtidal and intertidal ecology can be scoped out from further consideration.	Noted and agreed. Transboundary impacts for Benthic, Subtidal and Intertidal Ecology are screened out of the transboundary impact assessment (see Section 3.2 of this report).
September 2023	NatureScot, Scoping Opinion Consultation Response	Fish and Shellfish Ecology	NatureScot agree that transboundary impacts in relation to fish and shellfish ecology can be scoped out from further consideration.	Noted and agreed. Transboundary impacts for Fish and Shellfish Ecology are screened out of the transboundary impact assessment (see Section 3.2 of this report).

Date	Consultee and Type of Response	Topic	Consultation	Response to Issue Raised and/or where considered in EIA and HRA
September 2023	NatureScot, Scoping Opinion Consultation Response	Marine and Coastal Processes	NatureScot agree that transboundary impacts [in relation to marine and coastal processes can be scoped out from further consideration.	Noted and agreed. Transboundary impacts for Marine and Coastal Processes are screened out of the transboundary impact assessment (see Section 3.2 of this report).
September 2023	Royal Yachting Association (RYA) Scotland, Scoping Opinion Consultation Response	Shipping and Navigation	The RYA agree with the assessment of the potential for transboundary effects in relation to shipping and navigation.	Considered in Volume 2, Chapter 14 (Shipping and Navigation) and discussed in Section 3.3 of this report.
September 2023	UK Chamber of Shipping, Scoping Opinion Consultation Response	Shipping and Navigation	The UK Chamber of Shipping agree with the assessment of the potential for transboundary effects in relation to shipping and navigation for the project in isolation and note that this should be extended to cumulative.	Considered in Volume 2, Chapter 14 (Shipping and Navigation) and discussed in Section 3.3 of this report.

3. SCREENING OF TRANSBOUNDARY EFFECTS

3.1. OVERVIEW

3.1.1. The following sections detail the screening assessment of potential transboundary effects for the Proposed Development.

3.1.2. The screening includes consideration of the proximity of the Proposed Development to EEA states. The median line (or boundary of the European Exclusion Zone (EEZ)) which connects points located at equal distances from two coastal states, is used to measure between EEA states and the Proposed Development (Table 3-1).

Table 3-1 EEA state distances, in nm and km, to the Array Area and offshore Export Cable Corridor (ECC) for the Proposed Development

EEA state	Distance from Array Area (km)	Distance from Array Area (nm)	Distance from offshore ECC (km)	Distance from offshore ECC (nm)
Norway	151.45	81.78	164.39	88.74
Denmark	265.49	143.35	286.77	154.84
Germany	281.28	151.88	302.63	163.41
Netherlands	292.73	158.06	314.12	169.61
Belgium	638.93	345.00	656.58	354.53
France	667.80	360.58	684.78	369.77

3.1.3. Potential cross-border impacts with England have also been considered. Although Scotland and England have different regulatory systems, impacts on English receptors are considered cross-border rather than transboundary.

3.2. PHYSICAL AND BIOLOGICAL ENVIRONMENT

3.2.1. The Developer has carried out a transboundary screening assessment for all potential physical and biological receptors, the findings of which are presented in the sections below and summarized in Table *3-2*.

3.2.2. Potential impacts to marine and coastal processes, benthic subtidal and intertidal, fish and shellfish, marine mammal and offshore ornithology features of nature conservation designations outside of the UK EEZ due to the Proposed Development will be considered via the HRA process documented within the RIAA (Muir Mhòr Offshore Wind Farm Limited, 2024).

MARINE AND COASTAL PROCESSES

3.2.3. Potential impacts of the Proposed Development on marine and coastal processes during construction, O&M, and decommissioning include:

- Increases in Suspended Sediment Concentrations (SSCs) and changes to seabed levels;

- Potential impacts to seabed morphology (including sandbanks and notable bathymetric depressions);
- Modifications to littoral transport and coastal behaviour (erosion), including at landfall;
- Seabed scour resulting in bathymetric changes and localised alterations to sediment transport patterns;
- Modifications to the wave and tidal regime, and associated impacts to morphological features; and
- Modifications to stratification and frontal features.

3.2.4. Impacts are anticipated to be temporary in nature and localised within the marine and coastal processes study area. As such, it is considered that transboundary impacts on marine and coastal processes will not occur and have been screened out from further consideration within the EIAR.

3.2.5. This position is supported by the representations made as part of the Scoping Opinion (MD-LOT, 2023).

MARINE WATER AND SEDIMENT QUALITY

3.2.6. Potential impacts of the Proposed Development on Marine Water and Sediment Quality (MW&SQ) include:

- Deterioration in water quality due to re-suspension of sediments or release of drilling fluid;
- Release of sediment-bound contaminants from disturbed sediments;
- Deterioration in bathing water quality; and
- Deterioration in status of coastal and/or transitional waterbodies; and
- Deterioration in water clarity due to release of drilling fluid.

3.2.7. Impacts are expected to be temporary in nature and localised within the MW&SQ study area. As such, it is considered that transboundary impacts on MW&SQ will not occur and have been screened out from further consideration within the EIAR.

3.2.8. This position is supported by the representations made as part of the Scoping Opinion (MD-LOT, 2023).

BENTHIC SUBTIDAL AND INTERTIDAL ECOLOGY

3.2.9. Potential impacts of the Proposed Development on benthic subtidal and intertidal ecology include:

- Temporary increases in SSCs and changes to seabed levels;
- Temporary habitat disturbance;
- Direct and indirect seabed disturbance leading to release of sediment contaminants;
- Permanent and/or long-term habitat loss/alteration due to the addition or removal of infrastructure;
- Colonisation of hard substrates;

- Risk of introductions and/ or spreading of invasive non-native species particularly due to presence of infrastructure and vessel movements;
- Indirect effects on benthic ecology from electromagnetic field (EMF) effects generated by dynamic cables and buried cables; and
- Changes in marine and coastal processes resulting from the presence of subsea infrastructure.

3.2.10. Impacts are anticipated to be temporary in nature and localised within the benthic subtidal and intertidal ecology study area. Any impacts will likely be limited to one tidal excursion from the impact source. As such, it is considered that transboundary impacts on benthic subtidal and intertidal ecology will not occur and have been screened out from further consideration within the EIAR.

3.2.11. This position is supported by the representations made as part of the Scoping Opinion (MD-LOT, 2023).

FISH AND SHELLFISH ECOLOGY

3.2.12. Potential impacts of the Proposed Development on fish and shellfish ecology include:

- Increases in SSCs and changes to seabed levels;
- Temporary habitat disturbance;
- Direct and indirect seabed disturbance leading to release of sediment contaminants;
- Direct damage (e.g., crushing) and disturbance to mobile demersal and pelagic fish and shellfish species;
- Mortality, injury, behavioural impacts and auditory masking arising from noise and vibration;
- Permanent and/or long-term habitat loss/alteration due to the addition or removal of infrastructure;
- EMF effects arising from cables;
- Ghost fishing due to lost fishing gear becoming entangled in infrastructure
- Underwater noise and vibration from operational WTGs and vessels; and
- Introduction of new hard substrates and potential for fish aggregation.

3.2.13. Any impacts on fish and shellfish receptors will be temporary and localised in the fish and shellfish study areas (including those giving rise to the greatest footprint of effect such as underwater noise from piling), and any indirect effects will likely be limited to one tidal excursion from the impact source. As such, it is considered that transboundary impacts for fish and shellfish will not occur and have been screened out from further consideration within the EIAR.

3.2.14. This position is supported by the representations made as part of the Scoping Opinion (MD-LOT, 2023).

OFFSHORE ORNITHOLOGY

3.2.15. There is potential for transboundary impacts regards offshore ornithology from the following

- Direct Distributional Responses; and

- Collision

3.2.16. For all species, the project alone and cumulative impact assessments of direct distributional responses determined either minor or negligible adverse effects, which are not significant in EIA terms. When considering the wider populations that transboundary impacts may occur to and the distances these populations may be from the Array Area, the effects of direct distributional responses during the lifecycle of the Proposed Development are determined to be negligible.

3.2.17. For all species, the project alone and cumulative impact assessments of collision determined either minor or negligible adverse effects, which are not significant in EIA terms. When considering the wider populations that transboundary impacts may occur to and the distances these populations may be from the Array Area, the effects of direct distributional responses during the lifecycle of the Proposed Development are determined to be negligible.

3.2.18. As some species are susceptible to multiple impacts, a combined assessment of direct distributional responses and collision was completed. It was determined to result in either a minor or negligible adverse effect, which is not significant in EIA terms. When considering the wider populations that transboundary impacts may occur to and the distances these populations may be from the Array Area, the effects of the combined impacts during the lifecycle of the Proposed Development are determined to be negligible.

3.2.19. The risk of transboundary impacts with the potential to affect the integrity of transboundary European designated sites has been assessed in the RIAA (Muir Mhòr Offshore Wind Farm Limited, 2024)

MARINE MAMMALS

3.2.20. Potential impacts of the Proposed Development on marine mammals include:

- Noise related impacts associated with construction, O&M, and decommissioning activities resulting in auditory injury (i.e., Permanent Threshold Shift (PTS)) or disturbance;
- Indirect impacts resulting in marine mammal prey item disturbance and/or displacement;
- Disturbance related impacts associated with vessel traffic;
- Risk of injury resulting from entanglement of marine mammals within mooring lines or cables of WTGs, and the secondary interactions with derelict fishing gears wrapped around WTG mooring lines;
- Risk of injury resulting from collision with WTG structures;
- Impacts on marine mammal prey items from EMF due to presence of subsea cabling; and
- Long term habitat changes, displacement and/or barrier effects due to presence of WTGs.

3.2.21. There may be behavioural disturbance or displacement of marine mammals from the Proposed Development because of underwater noise. Behavioural disturbance resulting from underwater noise during construction could occur over large ranges (tens of kilometres) and therefore there is the potential for transboundary effects to occur where subsea noise arising from the Proposed Development could extend into waters of other EEA states. However, given the location of the Proposed Development relative to the nearest waters of other states

– approximately 160 km to the UK/Norway median line – the potential for disturbance of animals in waters of other EEA states is considered to be small.

3.2.22. In addition, any transboundary impacts that do occur because of the Proposed Development are predicted to be short-term and intermittent, with the recovery of marine mammal populations to affected areas following the completion of construction activities. For example, disturbance to prey species from loss of fish spawning and nursery habitat and suspended sediments and deposition may occur. However, the effects of reduction in prey availability are predicted to be limited in extent to within a few kilometres of the Proposed Development and are, therefore, not predicted to extend into the waters of other EEA states. Therefore, the impact of a reduction in prey ability will not lead to a significant effect.

3.2.23. As such, it is considered that transboundary impacts will not occur for marine mammals and have been screened out from further consideration within the EIAR.

3.2.24. The risk of transboundary impacts with the potential to affect the integrity of transboundary European designated sites has been assessed in the RIAA (Muir Mhòr Offshore Wind Farm Limited, 2024)..

CLIMATE

3.2.25. Potential impacts of the Proposed Development on climate include:

- Greenhouse gas (GHG) emissions arising from disturbance to blue carbon stocks during the construction, operation and maintenance and decommissioning of the Proposed Development;
- GHG emissions arising from the manufacturing and installation of the Proposed Development;
- GHG emissions arising from the consumption of materials and activities required to facilitate the operation and maintenance of the Proposed Development and estimated abatement of UK Grid emissions;
- GHG emissions arising from decommissioning works of the Proposed Development;
- Effects of climate change on the Proposed Development;
  - Increased safety risk during work associated with the Proposed Development due to high winds;
  - Increased health and safety risk from workers for the Proposed Development experiencing heat exhaustion due to increased temperatures;
  - Increased safety risk due to increased probability of fire e.g. due to overheating of fuel canisters;
  - Increased safety risk due to slips, trips and falls on board vessels;
  - Increased safety risk during work associated with the Proposed Development due to high waves;
  - Risk of damage to infrastructure due to climatic effects; and
  - Risk of changes in wind activity affecting power output of WTGs due to high wind speed above the cut-out wind speed; and
- Net GHG impacts of the Proposed Development.

3.2.26. All developments which emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor (including manufacturing of materials in other territories), and so may have a transboundary impact on climate change. Consequently, transboundary effects due to other specific international development projects are not individually identified but would be

taken into account when considering the impact of the Proposed Development within the assessment presented in Volume 2, Chapter 18 (Climate). Each country has its own policy and targets concerning carbon and climate change which are intended to limit GHG emissions to acceptable levels within that country's defined budget and international commitments.

3.2.27. The climatic effects assessment in Volume 2, Chapter 18 (Climate) concludes that impacts for the Proposed Development alone and cumulatively with other projects will not be significant in EIA terms or will be beneficial. Therefore, any impact resulting from the construction, operation and maintenance or decommissioning phases of the Proposed Development is not expected to have a transboundary impact on the environment of any EEA state and therefore transboundary impacts have been screened out from further consideration within the EIAR.

SUMMARY

Table *3-2* provides a summary of the screening of physical and biological transboundary effects.

Table 3-2 Transboundary matrix for the Proposed Development - Physical and Biological Environment

Screening Criteria	Marine and Coastal Processes	MW&SQ	Benthic Subtidal and Intertidal Ecology	Fish and Shellfish Ecology	Offshore Ornithology	Marine Mammals	Climate
Characteristics of the Proposed Development	Volume 1, Chapter 3 (Project Description) provides a detailed description of the Proposed Development. The Proposed Development comprises of up to 67 WTGs, with a maximum rotor blade diameter of up to 300 m, with a maximum blade tip height of 340 m above Mean Sea Level (MSL) and a minimum lower blade tip clearance of 30 m above MSL. WTGs will be supported by up to 67 WTG floating foundations, including their anchors and mooring lines. Options for mooring include Semi-Submersible Steel, Semi-Submersible Concrete, Barge, Tension Leg Platform (TLP), Multi-Tower Semi-Submersible, and Buoy. Anchor types under consideration include drag embedded anchor (including vertical loaded anchor), plate anchor, pile anchor (driven or drilled / drilled and grouted), suction anchor and gravity anchor. Scour protection may be required, with options including rock placement, grout or rock bags, concrete mattresses and frond mattresses. Up to 250 km of inter-array cables will connect individual WTGs to each other and to the OEP(s). There will be up to two OEP(s) as above-sea platforms with fixed jacket foundations, with either pin piles or caissons. Interconnector cables may connect the OEP(s) to each other. In the OEP(s), the inter-array cables transition to up to three export cables, each up to 90 km in length, which connect the Array Area to the grid connection point on the Scottish mainland.						
Location	The Proposed Development is in the North Sea, with the Array Area situated approximately 63 km due east of the Peterhead coastline and approximately 152 km from the Norwegian EEZ.						
Potential impacts and pathways	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.
Environmental importance							
Extent							
Magnitude							
Probability							
Duration							
Frequency							
Reversibility							
Cumulative Effects							

3.3. HUMAN ENVIROMENT

3.3.1. The Developer has carried out a transboundary screening assessment for all potential physical and biological receptors, the findings of which are presented in the sections below and summarised in Table 3-3.

COMMERCIAL FISHERIES

3.3.2. Potential impacts of the Proposed Development on commercial fisheries include:

- Reduction in access to, or exclusion from established fishing grounds;
- Displacement leading to gear conflict and increased fishing pressure on adjacent grounds;
- Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity;
- Increased vessel traffic associated with the Proposed Development within fishing grounds leading to interference with fishing activity;
- Additional steaming to alterative fishing grounds; and
- Increased snagging risk, which could result in loss or damage to fishing gear.

3.3.3. Transboundary impacts on commercial fisheries have been considered in the EIAR in relation to potential displacement of fishing activity into the Norwegian EEZ; see Volume 2, Chapter 13 (Commercial Fisheries). No residual Likely Significant Effects (LSE) were concluded.

SHIPPING AND NAVIGATION

3.3.4. A transboundary effect assessment in Volume 2, Chapter 14 (Shipping and Navigation) assesses effects from the Proposed Development upon the interests of European Economic Areas (EEA).

3.3.5. Transboundary impacts in terms of vessel routeing (including to international ports have been assessed for the Proposed Development in isolation and on a cumulative basis. Individual transits may have the potential to be associated with vessels that are internationally owned or located; however, any such transits have been captured within the baseline assessment of vessel traffic, noting that Automatic Identification carriage requirements are set by the IMO and apply across EEAs.

As such, no transboundary impacts other than those already assessed in Volume 2, Chapter: 14 (Shipping and Navigation) are anticipated. No residual LSE were concluded.

MARINE ARCHAEOLOGY AND CULTURAL HERITAGE

3.3.6. Potential impacts of the Proposed Development on marine archaeology and cultural heritage include:

- Loss of or damage to known and unknown marine historic environment assets from direct impacts;
- Loss of or damage to submerged prehistoric landscapes from direct impacts; and
- Indirect disturbance to marine historic environment assets caused by cable burial methods, cable protection, and cable repair and maintenance.

3.3.7. Impacts are anticipated to be temporary in nature and localised within the marine archaeology and cultural heritage study area. As such, it is considered that transboundary impacts on marine archaeology and cultural heritage will not occur and have been screened out from further consideration within the EIAR.

MILITARY AND CIVIL AVIATION

3.3.8. Potential impacts of the Proposed Development on military and civil aviation include:

- Creation of an aviation obstacle environment;
- Increased air traffic in the area related to wind farm activities; and
- Impact on NATS (En-Route) plc (NERL) Allanshill Primary Surveillance Radar (PSR), NERL Perwinnes PSR and Buchan Air Defence PSR during O&M.

3.3.9. Impacts are anticipated to be temporary in nature and localised within military and civil aviation study area, with the Proposed Development entirely within UK airspace and the nearest Norwegian operated airspace approximately 213 km to the north-east. Furthermore, the Array Area is significantly beyond the expected radar coverage from the nearest non-UK airport. As such, it is considered that transboundary impacts on military and civil aviation will not occur and have been screened out from further consideration within the EIAR.

SOCIO-ECONOMICS, TOURISM AND RECREATION

3.3.10. Potential impacts of the Proposed Development on socioeconomics, tourism and recreation include:

- Increase in employment and Gross Value Added (GVA);
- Demographic changes;
- Changes to housing demand;
- Changes to other local public and private services;
- Socio-cultural impacts;
- Changes to visitor behaviour;
- Changes to commercial fisheries; and
- Changes to shipping and marine recreation.

3.3.11. In addition to the Scottish and rest of the UK expenditure, there will also be significant expenditure in the European Union (EU) in relation to the Proposed Development during all phases. This is expected to lead to beneficial socio-economic effects, generating economic activity and supporting employment in the EU. While there are likely to be beneficial transboundary effects associated with the Proposed Development, given the size of the EU economy, it is unlikely that these effects will be significant. They have been screened out from further consideration within the EIA.

INFRASTRUCTURE AND OTHER USERS

3.3.12. Potential impacts of the Proposed Development on Infrastructure and Other User (IOU) receptors include:

- Temporary obstruction to other offshore wind farms;

- Temporary obstruction to subsea cables and utilities developments and associated activities;
- Temporary obstruction to licensed marine disposal sites and associated activities;
- Temporary obstruction to Innovation and Targeted Oil and Gas (INTOG) activities; and
- Temporary obstruction to oil and gas developments and associated activities.

3.3.13. No IOU receptors have been identified associated with neighboring EEA states. As such, there is no potential for transboundary impacts from the construction, O&M and decommissioning of the Proposed Development and they have been screened out from further consideration within the EIA.

SUMMARY

Table *3-3* provides a summary of the screening of human environmental transboundary effects.

Table 3-3 Transboundary matrix for the Proposed Development - human environment

Screening Criteria	Commercial Fisheries	Shipping and Navigation	Marine Archaeology and Cultural Heritage	Military and Civil Aviation	SLVR	Socioeconomics, Tourism and Recreation	IOU
Characteristics of the Proposed Development	The Proposed Development comprises of up to 67 WTGs, with a maximum rotor blade diameter of up to 300 m, with a maximum blade tip height of 340 m above Mean Sea Level (MSL) and a minimum lower blade tip clearance of 30 m above MSL. WTGs will be supported by up to 67 WTG floating foundations, including their anchors and mooring lines. Options for mooring include Semi-Submersible Steel, Semi-Submersible Concrete, Barge, Tension Leg Platform (TLP), Multi-Tower Semi-Submersible, and Buoy. Anchor types under consideration include drag embedded anchor (including vertical loaded anchor), plate anchor, pile anchor (driven or drilled / drilled and grouted), suction anchor and gravity anchor. Scour protection may be required, with options including rock placement, grout or rock bags, concrete mattresses and frond mattresses. Up to 250 km of inter-array cables will connect individual WTGs to each other and to the OEP(s). There will be up to two OEP(s) as above-sea platforms with fixed jacket foundations, with either pin piles or caissons. Interconnector cables may connect the OEP(s) to each other. In the OEP(s), the inter-array cables transition to up to three export cables, each up to 90 km in length, which connect the Array Area to the grid connection point on the Scottish mainland.						
Location of the Proposed Development	The Proposed Development is in the North Sea, with the Array Area situated approximately 63 km due east of the Peterhead coastline and approximately 152 km from the Norwegian EEZ.						
Potential impacts and pathways **Environmental importance** **Extent** **Magnitude** **Probability** **Duration** **Frequency** **Reversibility** **Cumulative Effects**	Screened in for potential transboundary impacts in relation to displacement of fishing activity into the Norwegian EEZ. Assessed further in Volume 2, Chapter 13 (Commercial Fisheries)	Screened in for potential transboundary impacts given the international nature of vessel traffic movements. Assessed further in Volume 2, Chapter 14 (Shipping and Navigation).	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.	Screened out – no significant transboundary effects are predicted.

4. CONCLUSIONS

4.1.1. This report has considered the location of the Proposed Development and Volume 1, Chapter: 3 (Project Description). There is potential for the Proposed Development to have transboundary impacts on the following topics:

- Commercial fisheries; and
- Shipping and navigation.

4.1.2. It is proposed that the following EEA states should be consulted on whether they intend to participate (particularly in relation to vessel transits to/from EEA State ports):

- Norway;
- Denmark;
- Germany; and
- Netherlands.

5. REFERENCES

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