MachairWind Offshore Windfarm

Appendix 8 Invasive Non-Native Species Mitigation Plan

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GLOSSARY OF ACRONYMS

Term	Definition
AFS	Anti-Fouling Systems
BFMP	Biofouling Management Plan
BRB	Biofouling Record Book
CCP	Critical Control Point
CES	Crown Estate Scotland
DDV	Drop-Down Video
Defra	Department for Environment, Food and Rural Affairs
ECC	Export Cable Corridor
ECoW	Environmental Clerk of Works
eDNA	Environmental DNA
EIAR	Environmental Impact Assessment Report
EUNIS	European Nature Information System
GW	Gigawatts
HACCP	Hazard Analysis and Critical Control Point
HVDC	High Voltage Direct Current
IAC	Inter-Array Cable
IMO	International Maritime Organisation
INNS	Invasive Non-Native Species
INNSMP	Invasive Non-Native Species Mitigation Plan
km	Kilometres
LAT	Lowest Astronomical Tide
m/s	Meters per second
MD-LOT	Marine Directorate-Licensing and Operations Team
MEPC	The Marine Environment Protection Committee
NBN	National Biodiversity Network
NS	NatureScot
OnTDA	Onshore Transmission Development Area
OSP	Offshore Substation Platform
ppt	Parts per thousand
ROV	Remotely operated vehicle
UK	United Kingdom
WDA	Windfarm Development Area
WTG	Wind Turbine Generator

GLOSSARY OF TERMS

Term	Definition
Cable protection	Protective measure to minimise the effects of scour and hazards along the offshore cables (e.g. to prevent cable exposure or snagging of vessel anchors or fishing gear), as well as for protecting these cables at infrastructure crossing points.
Development Area	Application boundary for consenting purposes which, for the Project, consists of a Windfarm Development Area, Offshore Export Cable Corridor, and Onshore Transmission Development Area. Separate consent and marine licence applications will be submitted for each Development Area where applicable.
Environmental DNA (eDNA)	Environmental DNA that is collected from the environment, such as in seawater, rather than directly from an individual organism.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed development over and above the existing circumstances (or 'baseline').
Environmental Impact Assessment (EIA) Regulations	A collective term referring to The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017.
Holistic Network Design (HND) process	An integrated approach for connecting 23 GW of offshore wind (including from ScotWind projects) to Great Britain providing a recommended offshore and onshore design for a 2030 electricity network, that facilitates the Government's ambition for 50 GW of offshore wind by 2030. The recommended design in the HND has equally considered four objectives to make sure the most appropriate approach is taken forwards, including: cost to consumer, deliverability and operability, impact on environment; and impact on local communities.
Inter-array cables (IACs)	Armoured cable containing electrical and fibre optic cores which link the wind turbine generators to each other and to the offshore substation platform(s).
Landfall	The area from Mean Low Water Springs to a transition bay(s), where the offshore export cable(s) come ashore.
Lowest Astronomical Tide (LAT)	The lowest level that can be expected to occur under average meteorological conditions and under any combination of astronomical conditions.
MachairWind Offshore Windfarm	An offshore windfarm capable of exporting around 2 GW of renewable energy to the National Electricity Transmission System. MachairWind Offshore Windfarm comprises three Development Areas: • The WDA – located on the west coast of Scotland to the northwest of Islay and west of Colonsay; • The Offshore Export Cable Corridor – a preliminary boundary extending from the WDA to mean high water springs at a landfall location near Girvan, South Ayrshire; and • The Onshore Transmission Development Area – a preliminary boundary which extends landward from mean low water springs and includes the land required for the landfall of the offshore export cables and their route up to but not including the proposed high voltage direct current

Term	Definition
	switching station which will be developed and constructed by Transmission Owner, ScottishPower Transmission. Separate consent and licence applications will be submitted for each Development Area.
National Electricity Transmission System	The high-voltage electricity power transmission network serving Great Britain which receives electricity from generators (such as offshore windfarms) and transmits that electricity to anywhere on the National Electricity Transmission System to satisfy demand.
Offshore cables	The collective term for all offshore cables i.e. IACs, offshore substation platform link cables, offshore export cables and associated fibre optic cables.
Offshore export cable	Armoured cable containing electrical cores between the offshore substation platform(s) and landfall. Offshore export cables will include bundled fibre optic cables. The offshore export cables are subject to Marine Licence applications under the Marine (Scotland) Act 2010. The portion of the offshore export cable(s) located within the WDA is assessed as part of this MachairWind WDA EIA and a marine licence application to construct, alter or improve this portion has been submitted alongside the WDA application. A separate marine licence application will be submitted for the portion of the offshore export cable(s) from the WDA boundary to mean high water Mean High Water Springs.
Offshore Export Cable Corridor (ECC)	The preliminary boundary extending from the WDA to mean high water springs near Girvan, South Ayrshire and within which the offshore export cable(s) will be located. A separate marine licence application will be submitted for the offshore export cable(s) located within the Offshore ECC.
Offshore Substation Platform (OSP)	An offshore platform with a fixed foundation located within the WDA which houses electrical equipment such as transformers, switchgear, protection and control systems, and enables the windfarm's renewable electricity to be collected via inter-array cables and exported to the National Electricity Transmission System via offshore export cables.
Offshore Substation Platform (OSP) link cables	Electrical cables which link OSPs (if more than one OSP is required). These cables will include fibre optic cores or bundled fibre optic cables. OSP link cables will be wholly located within the WDA.
Onshore Transmission Development Area (OnTDA)	The preliminary boundary which extends landward from mean low water springs and includes the land required for the landfall of the offshore export cables and their route up to but not including the proposed high voltage direct current switching station which will be developed and constructed by Transmission Owner, ScottishPower Transmission. This Transmission Owner is responsible for consenting the high voltage direct current switching station. Onward connections to the National Electricity Transmission System will be consented by National Grid Electricity Transmission and ScottishPower Transmission. Where relevant, these are considered as part of cumulative effects assessment in the EIA.
OnTDA infrastructure	The onshore transmission infrastructure, for which the Applicant is responsible, that is located primarily within the OnTDA, up to mean low water springs, and includes but is not limited to: landfall(s), onshore export cables, transition joint bays, telecom/SCADA infrastructure including vehicular access, joint bays, link boxes and temporary construction

Term	Definition
	compounds. The OnTDA infrastructure will be subject to a planning application under the Town and Country Planning (Scotland) Act 1997.
Operational life	The operational life is the expected length of time from final commissioning of the WDA until the cessation of commercial operations. This is anticipated to be 35 years.
Option Agreement Area (OAA)	The seabed area awarded to ScottishPower Renewables in January 2022 through the ScotWind leasing round.
Pre-construction works	Pre-construction works are activities undertaken prior to formal commencement of construction. Examples include survey works such as geotechnical and geophysical surveys and seabed preparation activities.
ScotWind	A Crown Estate Scotland seabed leasing round which enabled developers to propose offshore wind projects and apply for seabed rights to plan and build windfarms in Scottish waters.
Scour protection	Protective measures to avoid sediment being eroded away from the base of the wind turbine generator foundations as a result of the flow of water.
The Applicant	The legal entity submitting consent applications for the MachairWind Offshore Windfarm, namely Machairwind Limited.
The Lighthouse	The Dubh Artach lighthouse.
The Project	MachairWind Offshore Windfarm including all its Development Areas and associated infrastructure.
WDA infrastructure	The offshore generation and transmission infrastructure located within the WDA including but not limited to: WTGs, WTG fixed foundations (and associated scour protection), OSP(s), OSP fixed foundations (and associated scour protection), IACs, OSP link and offshore export cable(s) and their associated external cable protection (insofar as these are located within the WDA) and fibre optic cables.
Wind Turbine Generator (WTG)	A wind turbine generator which converts wind energy into electrical energy. Each wind turbine generator is a complex system composed of a high number of components. Typically, the main components include the rotor assembly (composed of three blades and a hub); the nacelle (containing a generator, shaft and gearbox, power electronic converter and transformer); and the tower (containing lifting equipment and the switchgear).
Windfarm Development Area (WDA)	The application boundary within the OAA where consent will be sought for the proposed WDA infrastructure. The WDA infrastructure is subject to Section 36 consent and marine licence applications (generation and transmission) which are being applied for separately from the Offshore ECC infrastructure and OnTDA infrastructure.

1 INTRODUCTION

1.1 BACKGROUND

1. In April 2022, as part of the ScotWind leasing round managed by Crown Estate Scotland (CES), Machairwind Limited ('the Applicant') entered into an Option to Lease Agreement with CES for an area of seabed in territorial waters off the west coast of Scotland, northwest of Islay and west of Colonsay. The MachairWind Offshore Windfarm ('the Project) will generate around 2 Gigawatts (GW) of renewable electricity with the potential to power up to two million UK homes, supporting Scotland's and the UK's transition to Net Zero.

2. As described in **Chapter 1 Introduction** of the Environmental Impact Assessment (EIA) Report (EIAR), the Project has been divided into three Development Areas:

   - The Windfarm Development Area (WDA);
   - The Offshore Export Cable Corridor (ECC); and
   - The Onshore Transmission Development Area (OnTDA).

3. Due to uncertainty that has arisen from the National Electricity System Operator Holistic Network Design (HND) process, the exact grid connection location for the Project has yet to be confirmed. Therefore, separate consent applications will be submitted in relation to the Offshore ECC and OnTDA. The current expectation is that the Project will connect to a new High Voltage Direct Current (HVDC) switching station to be built by the Transmission System Operator near Girvan, South Ayrshire. Due to the novel HVDC technology that will be used to transmit power generated from the Project to the grid network, the configuration and design of this infrastructure is in the early stages of development and will require refinement informed by discussions with the relevant Transmission System Operators.

4. This Invasive Non-Native Species Mitigation Plan (INNSMP) accompanies the EIAR submitted in support of applications for consent under Section 36 (s.36) of the Electricity Act 1989 and for Marine Licences under the Marine (Scotland) Act 2010, to be determined by Scottish Ministers via the Marine Directorate – Licensing Operations Team (MD-LOT), for the WDA infrastructure. It should be noted that this INNSMP also includes relevant and available information regarding the proposed Offshore ECC, which will be subject to a future marine licence application. Updates to this INNSMP will be undertaken at the time of the Offshore ECC application however it is not anticipated that these will be material. Moreover, post-consent and prior to transfer of ownership of the offshore transmission assets, a separate INNSMP will be created which includes the O&M activities relevant to the transmission assets, for which the Offshore Transmission Owner would be responsible.

5. This INNSMP applies to the construction, O&M, and decommissioning phases of the Project. While this version is primarily informed by the anticipated activities during the construction phase, potential O&M activities that may pose a risk of introducing or spreading invasive non-native species (INNS) have also been considered, with appropriate control measures identified. These activities and measures will be refined prior to the commencement of the O&M phase. Decommissioning activities are also addressed in this version, however, the INNSMP will be refined in advance of the commencement of decommissioning to align with the decommissioning programme required under Section 105 of the Energy Act 2004, to ensure that suitable INNS management measures are in place.

6. This INNSMP will take account of any relevant consent/Marine Licence conditions imposed and will be updated in line with these where appropriate.

7. The development of this INNSMP has been informed by the MD-LOT guidance on mitigation and monitoring plans, as set out in MD-LOT's guidance on licensing and consenting requirements for

offshore renewable energy (MD-LOT, 2025). This guidance outlines expectations for the structure, content, and implementation of such plans to support Marine Licence applications. As such, it contains sufficient detail to support the assessment and determination of consent and does not require further update and approval prior to commencement of construction. Any future updates, will be made in accordance with relevant consent/licence conditions.

1.2 CONSULTATION

8. The development of this INNSMP has also considered the feedback provided by consultees in the WDA Scoping Opinion (MD-LOT, 2024).

9. **Table 1.1** provides a summary of the comments, relevant to INNS, raised by consultees.

Table 1.1 Summary of consultation relevant to INNS

Stakeholder	Comment	Cross- Reference
NatureScot and Argyl and Bute Council	NatureScot advised that INNS should be scoped in at all phases of the project. The consultees noted the potential for WDA infrastructure to create opportunities for the spread of INNS.	The potential impacts of INNS at each stage of development have been considered in **Section 6.1**. The consideration for the introduction of artificial structures to act as a vector for INNS in **Section 6.1. Chapter 8 Benthic Ecology** of the EIAR provides an assessment of the likely significant effects of the introduction of INNS.

1.3 PURPOSE OF THE PLAN

10. INNS can present a significant threat to Scotland's biodiversity, particularly in marine and coastal environments. They have the potential to disrupt ecosystem functions and services, displace and outcompete native species, and alter marine and coastal habitats. Marine developments, including offshore windfarms, may create pathways for the introduction and subsequent spread of INNS through activities such as vessel movements, the installation of infrastructure, and the transfer of equipment and materials from port to site. As such, the effective management of INNS is essential to safeguarding ecological integrity and supporting wider goals relating to biodiversity conservation, such as the Scottish Government's commitment to halt biodiversity loss and be Nature Positive by 2030, and to have restored and regenerated biodiversity by 2045 (Scottish Government, 2024).

11. INNS' potential to significantly affect Scottish biodiversity and the importance of effectively managing INNS was acknowledged by the Scottish Government (2013) in the 2020 Challenge for Scotland's Biodiversity, which highlighted the need to manage pressures on Scottish ecosystems and introduced early strategic objectives to tackle INNS. The Scottish Government (2024) has subsequently built upon this foundation, with Scotland's Biodiversity Strategy to 2045: Tackling the Nature Emergency, which highlighted INNS as a key driver of global biodiversity loss and identified that effective management is critical to achieving the strategy's ambitious objectives.

12. This INNSMP has been developed to provide a systematic approach to the assessment and control of the INNS risk associated with the Project. The INNSMP aligns with the Scottish Government's (2012) Code of Practice on Non-Native Species, which sets out a clear framework of responsibilities centred around a three-tiered approach of prevention, rapid response, and control and containment.

13. The INNSMP aims to:

- Prevent the introduction and spread of INNS from activities associated with the Project through effective risk management and mitigation measures;
- Support compliance with relevant legislation, such as the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, Wildlife and Countryside Act 1981 (as amended), the

Conservation (Natural Habitats &c) Regulations 1994 and the Conservation of Habitats and Species Regulations 2017 (Scottish Government, 2017);

- Implement the policy principles and objectives that are set out in the Great Britain INNS Strategy: 2023-2030 (Department for Environment, Food and Rural Affairs (Defra), Scottish Government and Welsh Government, 2023) which promotes a strategic and coordinated approach to INNS management across Great Britain;
- Apply a systematic risk assessment methodology, in line with Payne et al. (2014) to effectively identify INNS introduction and spread pathways and inform proportionate mitigation measures;
- Support the delivery of national biodiversity goals, as outlined in Scotland's Biodiversity Strategy to 2045 (Scottish Government, 2024), through addressing INNS as a key driver of biodiversity loss; and
- Define roles, responsibilities, and procedures to support the INNSMP's implementation, monitoring, and continual improvement across all relevant development phases.

14. This INNSMP will be actively used by project staff, contractors, and relevant stakeholders throughout the lifecycle of the Project.

1.4 DOCUMENT STRUCTURE

15. The structure of this INNSMP is outlined in **Table 1.2**.

Table 1.2 Summary of the structure of the INNSMP

Chapter	Title	Summary of Content
1	Introduction	Provides an outline of the background of the Project, the purpose of the INNSMP, how it is structured, and how it links with other relevant environmental and management plans. This chapter also sets out the context for INNS risk and their relevance to Scottish biodiversity.
2	Project Overview	Overview of MachairWind including information on the key infrastructure associated with the Project.
3	Legislation, Policy and Guidance	Describes legislation, policy and guidance relevant to this INNSMP.
4	Roles and Responsibilities	Outlines the key roles and the responsibilities in relation to the implementation of the INNSMP.
5	Methodology	Overview of the risk-based approach used to identify, assess, and manage INNS pathways and impacts based on the best practice guidance (Payne et al., 2014).
6	MachairWind – INNSMP	Presents the site-specific INNS management measures designed in accordance with Payne et al. (2014), including the identification of potential INNS pathways, and implementation of mitigation, biosecurity protocols, and monitoring across relevant project phases.

2 PROJECT OVERVIEW

16. The MachairWind WDA is located approximately 12.4 kilometres (km) west of Colonsay and 15 km northwest of Islay and covers an area of 448 km^2 (**Figure 2.1**).

17. A summary of the key infrastructure for the WDA is provided below:

- Between 91 and 144 wind turbine generators (WTG) and associated fixed foundations and scour protection;
- Offshore Substation Platform(s) (OSP) and associated fixed foundations and scour protection;
- Inter-array cables and associated cable protection;
- OSP link cables and associated cable protection; and
- The portion of the offshore export cable(s) located within the WDA, and associated cable protection.

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6260000 6240000 6220000 6200000 6180000 6160000

141 m
766 m
A849
Firth of Lorn
B8086
Paps of Jura
B8018
A846
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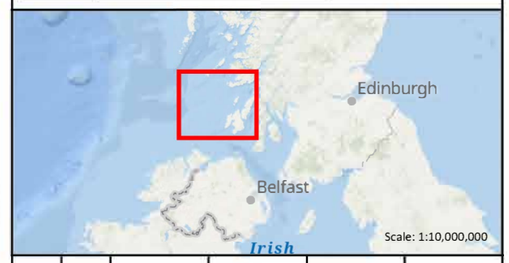
Sound of Jura

Windfarm Development Area

N

0 5 10 15 20 Kilometres



REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER
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PROJECT TITLE	MachairWind		

Figure 2.1: Windfarm Development Area Overview

Haskoning Enhancing Society Together

ScottishPower Renewables

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Name: Fig_1_MCW-DWF-ENV-MAP-RHS-000145_WDAOverview

3 LEGISLATION, POLICY AND GUIDANCE

18. **Table 3.1** summarises the key legislation, policy, and guidance documents relevant to the management of INNS within the context of the Project. These documents establish the legal and regulatory framework, set out government policy objectives, and provide best practice recommendations that have informed the development of the INNSMP.

Table 3.1 Summary of relevant legislation, policy, and guidance

Document Name	Relevance to the INNSMP
Legislation (Scotland/UK)	
Wildlife and Countryside Act 1981	Principle UK wide legislation controlling the release and spread of INNS. The 2011 Scottish amendments strengthen controls and enforcement, providing a legal basis for INNS prevention and control measures in Scotland. Under Section 14 of the Wildlife and Countryside Act it is an offence to introduce INNS, including in instances where site operations have allowed the spread of an INNS due to inadequate biosecurity management.
Invasive Alien Species (Enforcement and Permitting) Order 2019	Implements the Invasive Alien Species Regulation (1143/2014) into UK law, prohibiting the handling, sale, or release of certain invasive species without permits across Great Britain (GB) including Scotland.
The INNS (Amendment etc.) (EU Exit) Regulations 2019 and (EU Exit) (Scotland) (Amendment etc.) Regulations 2020	Post-Brexit statutory instruments to maintain operability of retained EU legislation related to INNS, including species lists and related restrictions in the UK and Scotland.
Animal Welfare and INNS (Amendment etc.) (EU Exit) Regulations 2020	Regulations updating legislation on animal welfare and INNS controls following EU exit, ensuring continued enforcement across the UK.
Merchant Shipping (Control and Management of Ships' Ballast and Sediments) Regulations* 2022	Implements the International Maritime Organisation's (IMO) International Convention for the Control and Management of Ships' Ballast Water and Sediments (2004) into UK law. Requires applicable ships to manage and treat ballast water to reduce the risk of introducing or spreading INNS via ballast water discharge.
Merchant Shipping (Anti-Fouling Systems (AFS))) Regulations 2024	Implements the International Convention on the Control of Harmful Anti-Fouling Systems on ships. Prohibits the use of certain toxic anti-fouling paints and coatings and enforces the use of safer, approved anti-fouling systems, helping to minimise the spread of marine INNS through hull biofouling.
International Convention for the Control and Management of Ships' Ballast Water and Sediments (adopted in 2004)	Adopted by IMO, the guidance establishes mandatory requirements for managing ballast water to prevent the spread of harmful aquatic organisms and invasive species. It requires ships to implement ballast water management plans, maintain records, and meet treatment standards to minimise ecological risks during the transfer of ballast water between different marine environments.
Policy	
The Marine Policy Statement (UK Government, 2011)	Instructs marine plan authorities to consider the transmission of INNS, using construction equipment.

Document Name	Relevance to the INNSMP
2020 Challenge for Scotland's Biodiversity	A Scottish Government biodiversity strategy highlighting INNS as a major threat to ecosystems and the economy, and setting out actions on prevention, early detection and control.
Scottish Biodiversity Strategy to 2045	The updated, and current, national strategy for biodiversity, which includes a high-priority commitment to develop and implement a Scottish plan for INNS. It promotes integrated management across marine and terrestrial environments through prevention, surveillance, and control measures.
The Great Britain INNS Strategy: 2023-2030 (2015, updated 2023)	A GB wide framework that sets priorities for managing INNS through prevention, early detection and rapid response, long-term management, and control measures. It applies across GB, including Scotland, and is structured around internationally recognised principles of INNS management.
Scottish Marine Assessment 2020	Evidence reports summarising marine environmental issues, including INNS pathways and impacts, informing marine policy and management
The Scottish Government National Marine Plan (Marine Scotland, 2015)	The statutory marine planning framework requires marine developments to reduce the introduction of INNS The key reference is: **GEN 10**: INNS: *"Opportunities to reduce the introduction of* INNS *to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made."*
Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020) and Draft Updated Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2025)	The Sectoral Marine Plan (SMP) for Offshore Wind Energy identifies sustainable areas for the future development of commercial scale offshore wind energy in Scotland, including a spatial strategy to inform the seabed leasing process for the purposes of offshore wind energy. The SMP requires the implementation of biosecurity plans during all phases of offshore wind developments to reduce the risk of introducing INNS.
National Policy Statement for Renewable Energy Infrastructure (EN-3)	The national policy requires Applicant's in England and Wales to assess the potential for INNS introduction and propose appropriate mitigation measures.
Guidance and Codes of Conduct	
Scottish Code of Practice on Non-native Species (2012)	Guidance issued under the Wildlife and Countryside Act 1981 (Section 14C) detailing legal responsibilities and best practices to prevent INNS introduction and spread in Scotland.
NatureScot guidance on marine INNS (NatureScot, 2023)	This document provides guidance on marine INNS.
Guidance on Non-Native Species, approved by the Scottish Parliament (Scottish Government, 2012)	Offers information INNS that pose risks to Scottish waters.
Marine Licensing and Consenting: Offshore Renewable Energy Projects – INNSMP	This online guidance sets out marine licensing requirements, including the obligation for applicants to submit a complete INNSMP at the time of application. The INNSMP must be finalised and approved before construction can commence.
Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species (2023)	Issued by IMO, these voluntary guidelines provide best practices for the control and management of biofouling on ships' hulls and underwater surfaces. They aim to reduce the risk of introducing INNS via hull fouling during vessel movements between different marine environments.

Document Name	Relevance to the INNSMP
Marine Biosecurity Planning: Guidance or Producing Site and Operation-Based Plans for Preventing the Introduction of Non-Native Species (Payne et al., 2014)	The guidelines inform the development and implementation of effective INNSMPs, providing a 6-step guide to preparing an INNSMP. The role of the document is to guide the site operator to encourage good biosecurity practice.
Resolution MEPC.207(62) 2011 Guidelines for the Control and Management of Ships Biofouling to Minimize the Transfer of Invasive Aquatic Species	The Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) has demonstrated commitment from its Member States to reduce the spread of invasive aquatic species through shipping.
MEPC 378 80 2023 Guidelines For the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species.	Adopted by the MEPC, The Guidelines aimed to offer consistent global recommendations for managing biofouling and reducing related risks on all ship types.
* Note this legislation is expected to be amended in April 2026. The 2026 amendments mandate that manufacturers document ballast water information. To promote best practices, the legislation requires that ballast water records must be monitored within an electronic record book. This document will be updated in future iterations to reflect any requirements regarding ballast water management as appropriate.	

4 ROLES AND RESPONSIBILITIES

19. The success of this INNSMP relies on its effective implementation which requires clear assignment of roles and responsibilities across all relevant parties. This chapter outlines these key roles and their associated responsibilities, relevant to INNS management, during the construction, O&M, and decommissioning phases of the Project. **Table 4.1** sets out the responsibilities assigned to each role, ensuring that the relevant parties understand their obligations with respect to preventing the introduction and/or spread of INNS in line with the relevant legislation, policies, and best practice.

Table 4.1 Summary of the key roles and responsibilities relevant to the INNSMP

Role	Responsibility
The Applicant (Developer)	Responsible for the overall implementation of the INNSMP, including monitoring and/or clearance and disposal of INNS at the Project, via the Developer's contractors and/or sub-contractors. The people acting on behalf of the Developer are responsible for reporting any incidents involving INNS internally to the Environmental Clerk of Works (ECoW) and or the Biosecurity Manager.
ECoW	Responsible for the independent quality assurance of this INNSMP, as well as monitoring the contractor/sub-contractor compliance to the INNSMP during all development phases of the Project. The ECoW, and the Biosecurity Manager, acting on behalf of the Developer, may assume the responsibility of reporting any incidents involving INNS externally to the Scottish Government's Marine Directorate (MD).
Biosecurity Manager	Responsible for managing biosecurity at the Project. The Biosecurity Manager is responsible for implementing the INNSMP, checking the Biosecurity Logbook, training staff in control measures, ensuring that all contractors, sub-contractors and visitors are aware of the aspects of the INNSMP that apply to them and report any unusual sightings to the appropriate contact.
Contractors and Sub-Contractors	Responsible for the implementation of the INNSMP through adherence to the control measures identified within the INNSMP, including early notification of the presence (suspected and/or confirmed) of INNS to or via the Biosecurity Manager.

5 METHODOLOGY

20. This section of the INNSMP outlines the risk-based methodology approach used to develop the INNSMP for the Project, following the approach set out in Payne et al. (2014). The methodology has been designed to identify potential pathways for the introduction and/or spread of INNS based on the characteristics of the site and activities being undertaken, assess the associated risks, and define effective control and monitoring measures.

21. The following sub-sections provide further detail of each stage of the process.

5.1 STEP ONE – UNDERSTAND THE SITE

22. The first step in developing the INNSMP involves gaining a baseline understanding of the site's (the WDA) abiotic and biotic characteristics. This informs the identification of potential INNS introduction pathways and the subsequent development of suitable control and monitoring measures.

23. Abiotic factors that should be assessed include:

- **Salinity:** Most marine fauna and flora cannot tolerate freshwater conditions for any length of time, therefore sites with greater freshwater influence are less hospitable for marine INNS. As such, the greatest risk of INNS establishment occurs when the water is fully saline (30 – 40 parts per thousand (ppt)); and
- **Artificial infrastructure:** The presence, type, condition, and maintenance of artificial infrastructure influence the risk of INNS colonisation, as INNS typically preferentially settle on artificial structures rather than natural substrate.

24. Biotic factors that should be assessed include:

- **Baseline presence of INNS**: Existing species records, survey reports, and national databases can indicate whether INNS are already present at the site. Even if there is no quantitative evidence indicating the presence of INNS at the site, the precautionary principle should be applied;
- **Ecological context**: The presence and condition of native species and habitats can influence the risk of INNS establishment, as disturbed and/or low-quality habitats are generally more vulnerable to invasion, as they offer reduced biotic resistance and increased opportunities for colonisation (Alidoost Salimi et al., 2021).

25. Based upon the above abiotic and biotic factors, a site can be assessed as being either a 'Low Risk' or a 'Significant Risk' site depending on the risk that the site poses in relation to the introduction or spread of INNS. **Table 5.1** provides an example of this approach.

26. Understanding both the abiotic and biotic features of the site is an essential process which allows the subsequent pathway analysis and control and monitoring measures.

Table 5.1 Example of a low risk and significant risk site

Low Risk Site	Significant Risk Site
• There is a freshwater supply; • There is a breakwater or wall around the majority of the site; and • There are structures present that either have an anti-fouling coating or are removed from the water and air dried on a regular basis (e.g., every six to 12 months).	• Water at the site is fully saline (30 – 40 ppt), with no or very limited freshwater influence; • There are structures present that are not treated with an anti-foulant coating and/or are submerged for longer than six months at a time; and • Fixed structures are present that can only be cleaned in-situ.

5.2 STEP TWO – UNDERSTAND HOW INNS CAN BE INTRODUCED OR SPREAD

27. The second step in developing the INNSMP involves understanding how INNS may either be introduced to the site or spread from site to site, as this is critical for assessing and effectively managing the biosecurity risks associated with INNS.

28. To identify pathways that pose a greater risk of introducing INNS, the guidance questions, and their corresponding risk levels detailed in **Table 5.2** should be used.

29. In general, the greatest risk of introducing INNS to the site is when a vessel (particularly slow moving vessels) and/or equipment arrives at the site from another country, region or water body, with similar environmental conditions (e.g., seawater temperature and salinity) while it is covered in biofouling (i.e., anything more than a thin, green slime coating for vessel hulls) or contains fauna or flora within other parts of its structure (such as ballast waters).

30. Another main risk of introducing INNS is from the arrival of a vessel and/or equipment with biofouling on the hull which has come from a site with a known INNS presence.

31. For the purposes of this assessment, any pathway that falls within the 'Low' category in **Table 5.2** is assessed as 'Low Risk'. Any activity that falls within the 'Medium' or 'High' categories is assessed as 'Significant Risk'.

Table 5.2 Example questions and associated risk level to consider when creating an INNSMP (Payne et al., 2014)

Question Number	Question	Risk Level
1	Has the vessel/equipment just arrived from the local area?	Low
2	Has the vessel/equipment had an anti-fouling coating applied to submerged structures within the last 12 months (or time recommended by manufacturer)?	Low
3	Are all the visible submerged surfaces free of biofouling (a green 'slime' is ok)?	Low
4	Do the visible submerged surfaces have more than a green 'slime' coating?	Medium
5	Does the vessel/equipment have noticeable clumps of algae and/or animals clinging to the visible parts of the hull/rudder/propeller?	High
6	Has the vessel/equipment just arrived from another country, region or water body with similar environmental conditions (e.g., seawater temperature)?	High
7	Has the vessel/equipment just arrived from a water body known to have INNS present?	High
8	Does the vessel/equipment spend long periods of time stationary at sites in between anti-fouling treatments?	High
9	Is the vessel 'slow moving', such as a construction barge or drilling rig?	High

5.3 STEP THREE – IDENTIFY ACTIVITIES WHICH RISK INTRODUCTION OF INNS

32. The third step in developing the INNSMP involves the identification of the main activities that may pose a risk of either introducing and/or spreading INNS. This includes consideration of both onsite activities as well as activities that involve the movement of vessels, equipment, and/or infrastructure into or out of the site.

33. Some activities, especially those taking place in areas that are never in contact with seawater or in fully enclosed systems, may represent little to no risk. However, in general, the precautionary

principle should be applied and as such consideration should be given to all relevant activities which take place in or around the water and include both vessels and structures.

34. Payne et al. (2014) identified that an in-depth approach to identifying activities which risk introducing INNS is generally recommended particularly for large, complex sites with many activities.

35. This in-depth approach helps to better quantify the risk associated with each identified activity. This approach also allows for more effective development of control measures, including where and when to apply them to achieve the best outcome. This approach is derived from the hazard analysis and critical control point (HACCP) framework, as outlined in Payne et al. (2014) and is made up of the following steps:

- **Step 1**: List Site Activities: Identify and compile all activities that have a reasonable risk of introducing INNS;
- **Step 2**: Describe the Activities: Provide a short description of each activity, this description should cover:
  - Who: The individual or team involved;
  - What: The specific activity being carried out;
  - When: The timing and duration of the activity;
  - Where: The locations involved in the activity;
  - Why: The purpose or objective of the activity; and
  - How: The method or process used to carry out the activity;
- **Step 3**: Split Activities into Tasks: Each activity should be split out into the component tasks. Each task should be briefly described with reference made to its sequence within the activity;
- **Step 4**: Establish Critical Control Points (CCP) and Control Measures: Regarding each activity and its component tasks, the following shall be assessed:
  - Risk: Evaluate the likelihood of the task leading to the introduction or spread of INNS;
  - Justification: Provide reasoning to explain the significance of the identified risk;
  - CCPs: Identify where control measures are most effectively applied within the task;
  - Control Measures: Detail the specific biosecurity control measure that should be applied at the CCP to mitigate the risk;
  - Who: Define the person or team responsible for the implementation of the control measure;
- **Step 5**: Develop an Action Plan: Based on the CCP and control measures identified in Step 4, this plan should detail:
  - Who will implement the control measures;
  - What actions will be taken; and
  - Where the CCPs for each activity are, to ensure the control measures are implemented at the correct time.

5.4 STEP FOUR – BIOSECURITY CONTROL MEASURES

36. The fourth step in developing the INNSMP involves defining clear and effective control measures for the activities identified in Step 3 (**Section 5.3**) as having the potential to introduce or spread INNS. This methodology prioritises practical, proportionate, and effective measures that reflect the level of control available at the site and across the associated activities.

37. It is important that control measures are developed using these guiding principles:

- Effective: control measures must be effective at preventing and/or reducing the introduction or spread of INNS;
- Simple: control measures must be easy to understand and implement;
- Feasible: control measures must be feasible, accounting for staff capacity, time constraints, and available resource; and

- Clear: control measures and instructions for their implementation must be easily communicated to staff, contractors/sub-contractors, and stakeholders.

38. As detailed in Step 3 (**Section 5.3**) the design of control measures must also consider:

- Who is responsible for implementing the control measure;
- What the control measure is and how it mitigates the risk;
- Where should the control measure be implemented; and
- When during the activity lifecycle the control measure needs to be implemented.

39. This methodology aligns with legal obligations to take reasonable steps to prevent the introduction of INNS and is intended to be adaptive. Control measures will be reviewed and refined as appropriate, as new knowledge, technologies, and good practices emerge.

5.5 STEP FIVE – BIOSECURITY SURVEILLANCE, MONITORING AND REPORTING PROCEDURES

40. The fifth step in developing the INNSMP involves establishing a simple, clear, and proactive approach to detecting INNS at the earliest possible stage, as early detection significantly improves the chances of containment and potential eradication.

41. This is achieved through:

- Routine visual surveillance by staff and other regular site users who are familiar with the site's usual condition;
- Training and awareness, ensuring that staff and other regular site users understand what to look out for, how to report any concerns, and why biosecurity matters;
- Encouraging a site-wide culture of vigilance, covering staff and all other regular site users, including contractors and sub-contractors, to report unusual or unfamiliar species;
- Clear reporting procedures, including what to do, who to contact, and where to report sightings, especially in the case of high-risk or high-alert species; and
- Maintaining accurate records of any reported sightings, including photographic evidence where possible, and arranging identification by specialists if needed.

42. The operator of the site should also define:

- Who is responsible for conducting regular surveillance and maintaining records;
- How vessel owners and other stakeholders will be engaged and supported in reporting potential INNS; and
- What training will be provided, and how it will be reviewed and updated over time.

5.6 STEP SIX – CONTINGENCY PLAN

43. The sixth step sets out how to prepare for and respond to potential failures in biosecurity measures that could lead to the introduction or spread of INNS. The primary aim of the contingency plan is to ensure that clear, rapid, and effective actions are in place and can be taken as soon as a potential issue is identified.

44. The contingency plan should be:

- Simple;
- Accessible; and
- Practical.

45. A simple and effective contingency plan should outline a clear sequence of actions to take in response to potential biosecurity breaches. These may result from external risks or from failures in the control measures previously developed for specific high-risk activities. In either case, the

contingency plan should establish what needs to happen, when, and by whom. Actions should include:

- Rapid identification of 'suspect' species, including use of basic ID guides or collection of samples;
- A quick assessment or survey to determine the extent of any suspected INNS;
- Immediate communication to relevant stakeholders;
- Accessing expert advice on species identification, containment, and potential eradication;
- Physical containment, such as marking off affected areas;
- Temporary vessel movement restrictions and precautionary vessel cleaning requirements;
- Ongoing monitoring of the site if the species is deemed low risk or has yet to be fully identified; and
- A clearly defined escalation process if a high-alert species is confirmed as present.

46. To ensure the contingency plan is as effective as possible at implementing the defined actions, the plan should also include:

- A list of key personnel and their responsibilities in the event of a biosecurity breach;
- An inventory of any special equipment needed; and
- Pre-agreed communication methods and contact details for alerting relevant parties quickly.

5.7 MONITORING AND REVIEW

47. This section outlines how to develop an effective monitoring and review process for the INNSMP.

48. Once the biosecurity plan is in place, a clear system must be established to log inspections, actions, and any INNS related findings (such as the Biosecurity Logbook). The establishment of this system will ensure prompt notification to the Biosecurity Manager in case of potential INNS introduction. The Biosecurity Logbook should include:

- Routine inspections and biosecurity actions taken;
- Anti-fouling applications and/or vessel and equipment cleaning;
- High-risk vessel inspections and follow-up actions; and
- Awareness raising activities or training sessions.

49. It is essential that the INNSMP is regularly reviewed to ensure that it remains relevant and effective. At a minimum, the INNSMP should be reviewed annually. However, if new activities, such as commencing new O&M activities or switching from installing one type of infrastructure to another start to occur onsite, the INNSMP should be reviewed immediately with control measures being implemented as required.

6 MACHAIRWIND WDA – INNS MITIGATION PLAN

50. This section of the INNSMP implements the methodology outlined in **Section 5.** The application of the methodology identifies potential risks of introduction and/or spread of INNS based on the specific characteristics of the WDA and activities being undertaken. This section defines the effective control and monitoring measures that will be implemented during the construction, O&M and decommissioning of the Project.

6.1 STEP ONE – UNDERSTAND THE SITE

51. To support the characterisation of the abiotic and biotic conditions within the WDA several data sources have been used, a summary of which is provided in **Table 6.1.** It should be noted that when the time comes to consent the Offshore ECC infrastructure, this section will be updated and this INNSMP resubmitted as part of the Offshore ECC application. This will ensure the Offshore ECC is appropriately characterised and any specific control measures accounted for in subsequent sections, as required.

Table 6.1 Summary of data sources used to characterise the WDA

Data Source	Description/Use
Third-Party Benthic Survey: Appendix B[1] of the Scoping Report	A Benthic survey was undertaken by a third-party which overlaps with the Option Agreement Area (OAA). The benthic survey was undertaken by Briggs Marine and comprised the following: • 60 benthic sediment grab samples for contaminant, faunal, biomass and particle size distribution analysis; and • 20 transects of Drop-Down Video (DDV). This data has been acquired by the Applicant to supplement the Project's site investigation survey data which together has been used to characterise the WDA. See **Appendix B Third-Party Benthic Subtidal Survey Interpretative Report**.

Project's site investigation survey (Contaminants Survey Report: Appendix C[2], Benthic Characterisation Report: Appendix D[3], all submitted with the Scoping Report)	Site investigation surveys were undertaken to support characterisation of the physical marine environment.
	• Geophysical survey (2 km x 500 metres (m) line spacing)
	  ○ Side Scan Sonar;
	  ○ Multibeam Echosounder;
	  ○ Sub Bottom Profiler;
	  ○ Magnetometer.
	• 57 benthic sediment grabs for contaminant, faunal, biomass and particle size distribution analysis;
	• 59 transects of DDV with seabed photographs; and
	• 29 water samples for eDNA analysis.
	The data were used to inform the ecological context of the site and support interpretation of INNS pathways and settlement potential.

[1] https://marine.gov.scot/sites/default/files/appendix_b_0.pdf
[2] https://marine.gov.scot/sites/default/files/241001_-_machairwind_-_scop-0057_-_appendix_c_-_contaminants_survey_report_-_developer_to_md-lot.pdf
[3] https://marine.gov.scot/sites/default/files/241001_-_machairwind_-_scop-0057_-_appendix_d_-_machairwind_2023_benthic_characterisation_report_-_developer_to_md-lot_redacted.pdf

Data Source	Description/Use
Project's Metocean Survey	A floating LiDAR Buoy was deployed to measure marine conditions including: • Wind profile up to 300 m (speed and direction); • Wind data at 4 m (speed and direction); • Meteorological parameters at 4 m (air temperature, pressure, density); • Wave parameters (height, period, direction); • Current profile (speed and direction); • Sea surface temperature and salinity; • Near bed current (speed and direction); • Seabed temperature and salinity; • Seabed turbidity; and • Water level. Useful for characterising physical site conditions relevant to INNS.

52. As detailed in **Section 2**, the WDA is located approximately 12.4 km west of Colonsay and 15 km northwest of Islay and covers an area of 448 km^2. As identified through the 2023 geophysical survey of the WDA the minimum and maximum water depths are 21.6 m to 81.7 m below the Lowest Astronomical Tide (LAT) (Fugro, 2024), shallower depths found where bedrock outcrops north and east of WDA. Across the WDA, peak flows for mean spring tides of between 0.65 meters per second (m/s) and 1 m/s have been modelled (ABPmer, 2008a). Annual mean significant wave height across the WDA ranges from 1.8 to 2.1 m (ABPmer, 2008b).

53. The abiotic factors identified in **Section 5.1**, have been considered below:

Salinity: Due to the WDA's distance from land the WDA is determined to be fully marine and therefore has a salinity consistent with other offshore areas of the Atlantic Ocean, where salinity is approximately 35 ppt.

- **Artificial structures:** Dubh Artach lighthouse (constructed between 1869 and 1872) is an artificial structure located on a rocky outcrop approximately 2 nm northeast of the WDA. Additionally, 49 marine archaeological anomalies have been identified within the WDA. Artificial structures will however be introduced to the site during the construction phase, when the Project infrastructure is installed (**Section 2**).

54. The biotic factors identified in **Section 5.1**, have been considered below:

- **Baseline presence of INNS**: Baseline investigations did not record the presence of INNS within the WDA. Other site-specific benthic surveys, including DDV and grab sampling, at selected locations, did not identify any INNS within the WDA (Appendix B, Appendix D of the Scoping Report). In addition, a review of publicly available data sources, including the National Biodiversity Network (NBN) Atlas, did not identify any existing records of marine INNS within the WDA (NBN Atlas, accessed 2025). However, species of concern have been identified as being in close proximity to the WDA. Recordings of INNS include:
  - One record of Pacific oyster (*Magallana gigas*) approximately 15 km east from the WDA; and
  - Four records of Japanese wireweed (*Sargassum muticum*) approximately east from 12 km from the WDA.
- **Ecological context:** The European Nature Information System (EUNIS) (EMODnet, 2024) notes that the WDA is characterised predominantly by circalittoral fine sand, circalittoral muddy sand and stable circalittoral rock, confirmed by site-specific benthic survey data. Four EUNIS level 5 biotopes were identified within the WDA:

- *Ophiothrix fragilis* and/or *Ophiocomina nigra* brittlestar beds on sublittoral mixed sediment (SS.SMx.CMx.OphMx);
- Seapens and burrowing megafauna in circalittoral fine mud (SS.SMu.CfiMu.SpnMeg)
- Burrowing megafauna and the volcano worm (*Maxmuelleria lankesteri*) in circalittoral mud (SS.Smu.CfiMu.MegMax); and
- Stable rocky aggregations colonised by echinoderms (CR.MCR.EcCr).

55. The environmental parameters of the WDA are of potential high suitability for colonisation by most marine INNS currently recorded in UK waters. Such include, the presence of hard substrate such as cobble and boulder aggregations, established brittle star beds and the presence of nearby Pacific oyster. The WDA's saline conditions (~35ppt) further enhance its suitability as may the presence of the nearby lighthouse. Many marine INNS in UK coastal environments exhibit a preference for hard substrates or nearshore habitats such as ports, harbours and rocky reef systems, where they can more easily establish and spread. The physical and ecological characteristics of the WDA therefore present an inherently significant risk of natural colonisation by INNS under baseline conditions. However, with the relevant biosecurity measures (see **Section 6.3**) the risk of INNS colonisation can be minimised to a low magnitude.

6.2 STEP TWO – UNDERSTAND HOW INNS CAN BE INTRODUCED OR SPREAD

56. A summary of the key vessels associated with construction and O&M of the Project is presented in **Table 6.2.** This table also provides information on the associated INNS introduction pathways, outlining the inherent risk factors. This forms the basis for the identification of activities presented in **Section 6.3**.

Table 6.2 Summary of the potential pathways for INNS to be introduced or spread at the WDA

Name	Type	Pathways	Risk Factors
Vessels (construction and decommissioning)	A variety of vessel types will be used for construction activities (including pre-construction activities). The below provides a non-exhaustive list of the vessel types typically used: • Dredging vessel; • Tugs and barges storage and transport; • Jack-up vessel; • Dynamic position heavy lift vessel; • Accommodation vessel; • Windfarm service vessel; • WTG installation vessel; • Tug with accommodation barge; • Supply vessel; • Accommodation vessel; • Cable laying vessels; • Support vessels; and • Workboat.	• Biofouling of submerged surfaces including hulls, intakes, anchors; • Ballast water discharge; and • Biofouling on installation tools/equipment and transfer between sites.	• Vessels may be sourced from other marine water bodies with similar environmental conditions; • Long in-water duration also promotes colonisation; • Extended static or slow-moving periods allow for biofouling to develop; • Repeated port to site visits; • Infrequent hull cleaning; and • Ballast water not exchanged or treated properly.
Vessels (O&M)	Vessel types used during O&M activities are likely to include: • Service operation vessels (SOV); • SOV daughter craft; • Crew Transfer Vessel; and • Jack-up vessel.	• Biofouling on submerged surfaces, including hulls, intakes, anchors; • Ballast water discharge; and • Biofouling on operation/maintenance equipment/tools and transfer between sites.	

WTG and OSP foundations	WTG foundation options include:
	• Monopiles which typically comprise:
	  ○ A cylindrical steel pile; and
	  ○ A transition piece (TP) (including secondary structures e.g. handrails, ladders and working platforms).
	• Pin-pile jackets and suction bucket jackets which typically comprise:
		• Biofouling on submerged surfaces;
		• Seabed sediment and marine growth disturbance during foundation installation/repair; and
		• Biofouling on equipment used for cable installing WTGs and OSP foundations or repair/maintenance activities.
			• Long in-water duration promotes colonisation; and
			• Submerged surface area for potential colonisation.

Name	Type	Pathways	Risk Factors
	○ A steel lattice structure with tubular sections and an integrated transition piece; ○ Secondary structures e.g. handrails, ladders and working platforms; and ○ Up to 4 legs with the footing for each leg secured to the seabed with 1 pin-pile or a single suction bucket. OSP foundation options include: • Pin-pile jackets and suction bucket jackets which typically comprise: ○ A steel lattice structure with tubular sections and an integrated transition piece; ○ Secondary structures e.g. handrails, ladders and working platforms; and ○ Up to 8 legs with the footing for each leg secured to the seabed with up to 2 pin-piles or a single suction bucket. • Gravity base structure foundations which comprise of concrete or reinforced concrete with a thick internal steel lattice structure.		
Subsea cable infrastructure	IACs, OSP link cables and export cable(s).	• Biofouling on static cables (where unburied); • Seabed sediment and marine growth disturbance during cable installation/repair; and • Biofouling on equipment used for cable laying and burial or repair/maintenance activities.	• Long in-water duration promotes colonisation; and • Submerged surface area for potential colonisation.
Cable protection/scour protection	Cable protection may include: • Rock placement; • Concrete mattresses; • Frond mattresses; • Protective aprons or coverings; • Bagged solutions; • Cable protection system (e.g. Uraduct shell or similar); and	• INNS hitchhiking on imported materials; and • Biofouling on the exposed surfaces on the cable protection.	• Long in-water duration promotes colonisation; • Materials sourced without biosecurity checks; and • Irregular inspections and cleaning on exposed surfaces.

Name	Type	Pathways	Risk Factors
	• Cast iron shells. Scour protection may include: • Rock placement; • Rock filed bags; • Pre-cast concrete block mattresses; • Concrete and grout filled bags; • Sand bags; • Frond mats; and • Glass fibre reinforced polymer.		

6.3 STEP THREE – IDENTIFY ACTIVITIES WHICH RISK INTRODUCTION OF INNS

57. An in-depth approach has been implemented. As such, **Table 6.3** provides a summary of the key activities associated with the construction, O&M, and decommissioning development phases that have the theoretical potential to introduce INNS. The table also provides a brief description of each activity based on the who, what, when, where, why, and how methodology.

58. The activities have then been further assessed and broken down into their sequential component tasks, as presented in **Table 6.3** . This has been done to gain a more in-depth understanding of the process and the potential hazards of the activity, and the points at which INNS could be introduced. These component tasks were then used to inform the CCP and control measure assessment undertaken in **Section 6.3.**

Table 6.3 Summary of the key activities associated with the construction, O&M, and decommissioning phases of the Project with the potential to introduce INNS

Phase	Activity	Description	Component Tasks
Construction	Pre-installation surveys and seabed preparation (UXO surveys and clearance, boulder clearance)	• Who: Survey contractors/vessel operator; • What: Surveys and clearance campaigns at the Project; • When: Pre-installation of WDA and Offshore ECC infrastructure; • Where: Within the WDA/Offshore ECC; • Why: To ensure seabed is prepared for installation of WDA / Offshore ECC infrastructure; and • How: Vessels such as remotely operated vehicles (ROVs) or anchor handling vessel.	1. Mobilise vessel and required equipment. 2. Transit to the WDA / Offshore ECC. 3. Undertake survey and clearance activities. 4. Return to port and demobilise.
	Installation of WTG and OSP foundations and scour protection	• Who: Installation contractors/vessel operator; • What: Fixed foundation type to be decided, informed by detailed geotechnical surveys post-consent; • When: Following seabed preparation; • Where: Within the WDA predefined locations; • Why: To support WTG and OSP installation; and • How: Pile driving or drilling.	1. Mobilise vessel and required equipment. 2. Transport of scour protection and foundations to the WDA for installation. 3. Installation of scour protection and foundations. 4. Return to port and demobilise.
	Installation of the WTGs and OSP topsides	• Who: Installation contractors/vessel operator; • What: Position WTGs on preinstalled foundations / transition pieces; • When: After foundations or transition pieces have been installed followed by the nacelle and WTG blades; • Where: Within the WDA predefined locations; • Why: To allow for the installation of the electricity generating infrastructure; and • How: Lowered onto foundation or transition piece.	1. Mobilise vessel and required equipment. 2. Transit to the WDA. 3. WTG installation. 4. Demobilisation of vessels and equipment.

Phase	Activity	Description	Component Tasks
	Installation of subsea cable infrastructure (including IACs, OSP link cables, export cable(s) and associated cable protection)	• Who: Installation contractors/vessel operator; • What: Installation of offshore cables and deployment of external cable protection, primarily for unburied sections; • When: To start once foundations are in position. Cable protection installation to occur immediately after cable installation or at the same time; • Where: Along pre-surveyed seabed routes between the WTGs and OSPs; • Why: To enable electrical transmission for export and to protect cables from damage; and • How: Using cable laying vessels alongside specialist tools and equipment.	1. Mobilise vessels and required equipment, load out required cable infrastructure. 2. Transit to the WDA / Offshore ECC. 3. Deploy and install the offshore cables. 4. Deploy external cable protection at defined locations. 5. Post-installation testing and demobilisation.
Operation and maintenance	Routine inspections	• Who: Maintenance team/vessel operator; • What: Check infrastructure; • When: On a planned schedule consistent with infrastructure requirements; • Where: At specific infrastructure installed within the WDA / Offshore ECC; • Why: To ensure safe, efficient, and continuous operation of infrastructure; and • How: Via vessel-based surveys.	1. Mobilise vessel and required inspection equipment. 2. Transit to the WDA / Offshore ECC. 3. Deploy divers and/or inspection equipment (ROVs). 4. Undertake inspection activities. 5. Recover all inspection equipment and demobilise.
	Environmental surveys (if required) (including deployment of temporary survey devices, such as monitoring buoys)	• Who: Survey contractor/vessel operator; • What: Conduct a range of environmental surveys; • When: Typically done in line with pre-defined monitoring schedules; • Where: Within the WDA / Offshore ECC; • Why: To comply with monitoring schedules and/or to develop understanding of the interactions of infrastructure within the environment; and • How: Via the use of a range of survey equipment, typically deployed from marine vessels.	1. Mobilise vessels and survey equipment. 2. Transit to the WDA / Offshore ECC. 3. Deploy survey equipment. 4. Conduct survey operations. 5. Recover survey equipment, finish survey, and demobilise.

Phase	Activity	Description	Component Tasks
	Repairs and replacements	• Who: Maintenance team/vessel operator; • What: Carry out repairs and replacements for worn or damaged components or damaged offshore cables; • When: As defined by planned maintenance schedules or post fault detection; • Where: At the relevant infrastructure; • Why: To restore system functionality; and • How: Access via marine vessels, and specialist equipment.	1. Mobilise vessels and required equipment. 2. Transit to the WDA / Offshore ECC. 3. Deployment of repair equipment. 4. Perform repair or replacement. 5. Equipment recovery and demobilisation.
	Painting and corrosion protection	• Who: Maintenance team/vessel operator; • What: Re-coat structures to protect against corrosion; • When: As per the O&M planned maintenance schedule, or reactively in response to inspection findings; • Where: Above the waterline on exposed surfaces; • Why: To help maintain structural rigidity and prolong structure lifespan; and • How: Either via vessel-based access or vessel drops. Painting involves surface preparation, followed by marine grade coatings.	1. Mobilise vessels and required painting and corrosion protection equipment and materials. 2. Transit to the WDA. 3. Deployment of coating and surface preparation equipment. 4. Surface preparation and coating application. 5. Equipment recovery and demobilisation.
	Removal of marine growth from WTGs and OSPs above and below the water line	• Who: Maintenance team/vessel operator; • What: Remove bio-fouling from sub-surface infrastructure; • When: Periodically, depending on fouling rates and the results of scheduled inspections. Also, as part of preparation works for repair and replacement activities; • Where: Below the waterline; • Why: To preserve system integrity and infrastructure lifespan; and	1. Mobilise vessels and required cleaning equipment. 2. Transit to the WDA. 3. Deployment of cleaning equipment. 4. Removal of marine growth. 5. Equipment recovery and demobilisation.

Phase	Activity	Description	Component Tasks
		• How: The removal of marine growth from sub-surface infrastructure is typically done via high-pressure water jets, mechanical scrapers, or brushes. For subsurface marine growth, an ROV is likely to be used.	
Decommissioning	Decommissioning of the WTGs, OSPs and associated foundations	• Who: Decommissioning contractor/vessel operator; • What: Disconnect and dismantle the WTGs; • When: At the end of the operational life; • Where: Within the WDA, with infrastructure being removed to port, as required; • Why: To return the WDA to a pre-development state, to the extent required; and • How: Reversal of the installation process, including transportation to shore and recycling or disposal, in line with the waste management hierarchy.	1. Mobilise vessels and required decommissioning equipment. 2. Transit to the WDA. 3. Removal of WTGs, OSPs and associated foundations (process would be the reverse of construction). 4. Transport the WTGs, OSPs and associated foundations to designated port for decommissioning and recycling onshore. 5. Demobilisation of vessel and decommissioning equipment.
	If required, decommissioning of subsea cable infrastructure (including external cable protection)	• Who: Decommissioning contractor/vessel operator; • What: If required, remove all offshore cables and external cable protection measures; • When: After electrical systems have been de-energised; • Where: Within the WDA / Offshore ECC along the defined offshore cable routes; • Why: To fulfil decommissioning requirements and return the WDA to a pre-development state to the extent required; and • How: The removal of subsea cables will involve exposing the buried cables, retrieving and cutting cable sections, followed by proper recycling or disposal of materials.	1. Mobilisation of vessels and decommissioning equipment. 2. Transit to the WDA / Offshore ECC. 3. Removal of cable infrastructure. 4. Handling and storage of recovered cable materials for recycling onshore. 5. Demobilisation of vessels and decommissioning equipment.

6.4 STEP FOUR – BIOSECURITY CONTROL MEASURES

59. Based upon the construction, O&M, and decommissioning activities and their component tasks identified in **Section 6.1**, an analysis as presented in **Table 6.4**, (construction), **Table 6.5** (O&M), and **Table 6.6** (decommissioning) has been undertaken in order to determine where CCPs lay within each activity and what control measures are required to reduce the risk of INNS introduction/spread to Low (not significant) risk. Where possible, control measures have been introduced at an early stage in the activity to de-risk subsequent component tasks and prevent/reduce the risk of INNS introduction.

60. Where CCPs and control measures have been identified this reflects a commitment by the Developer to ensure that these control measures are effectively applied during the relevant activity.

61. The construction, O&M, and decommissioning phase activities listed in **Table 6.4**, **Table 6.5** and **Table 6.6** are of a similar nature, all being marine-based and typically involve vessel mobilisation, transit, in-water operations, and demobilisation. As such the component tasks, associated CCPs, and control measures are all broadly aligned. Whilst this may appear repetitive, this consistency across development phases and activities is not redundant. Instead, it reflects the shared INNS pathways across the identified activities. Therefore, the consistent and repeated application of the control measures is essential to ensure robust and effective INNS risk management across all Project phases. This approach aligns with the HACCP principles (Payne et al., 2014) and ensures risks are systematically controlled at the most appropriate stage of the activity.

62. The control measures detailed in **Table 6.4**, **Table 6.5** and **Table 6.6**, such as the use of effective anti-fouling systems (AFS) and the implementation of ballast water management procedures have been developed based upon recognised international and national legislation, best practice and guidance as follows:

- AFS control measures reflect the requirements of the Merchant Shipping (Anti-Fouling Systems) Regulations 2024 (UK Government, 2024), and the 2023 IMO Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species (IMO, 2023); and
- Ballast water control measures have again been developed and influenced by international and national legislation, with control measures designed to align with the International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 (as amended) (IMO, 2004, as amended (2021)) and its implementation in United Kingdom (UK) law through the Merchant Shipping (Control and Management of Ships' Ballast and Sediments) Regulations 2022 (UK Government, 2022).

63. These control measures are determined to be robust and effective at preventing and reducing the risk of INNS introduction.

Table 6.4 CCPs and control measures identified as necessary for pre-construction and construction activities

Activity	Task	Risk (Is there a significant risk of this task introducing INNS?)	Justification (Explain risk, if there is a risk, describe it here)	CCP (Are control measures most effectively applied at this stage?)	Control Measure (What control measures can be applied to this task?)	Who (Who will carry out the control measure?)
Pre-installation surveys and seabed preparation (UXO surveys and clearance, boulder clearance)	1. Mobilise vessel and required equipment	Yes	• Vessels and survey equipment may be biofouled from previous surveys/deployments.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's Biofouling Management Plan (BFMP)/maintenance schedule. Where applicable, maintain a Biofouling Record Book (BRB). Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk.	Survey contractor/ vessel operator
	2. Transit to the WDA	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with the prior task; • However, INNS may be released through ballast water exchange if this risk is not properly managed; and • External, submerged surfaces may become fouled during transit.	Yes	• Comply with the IMO guidelines (2021) regarding ballast water management and exchange; • Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit details.	Vessel operator

Activity	Task	Risk (Is there a significant risk of this task introducing INNS?)	Justification (Explain risk, if there is a risk, describe it here)	CCP (Are control measures most effectively applied at this stage?)	Control Measure (What control measures can be applied to this task?)	Who (Who will carry out the control measure?)
	3. Undertake survey and clearance activities	No	• All survey equipment has been inspected and treated during mobilisation (Task 1). Therefore, deployment presents no new risk of INNS introduction if prior control measures have been implemented; • Survey takes place in a defined location using pre-checked equipment (Task 1); and • Survey equipment is in continuous controlled use.	No	No	N/A
	4. Return to port and demobilise	Yes	• On retrieval of the survey equipment, it may be biofouled and could transfer INNS to port or subsequent sites.	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and • Inspect, clean, disinfect, and dry all equipment/tools after use, focusing on removal of fouling and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	Survey contractor/ vessel operator
Installation of WTG and OSP foundations and scour protection	1. Mobilise vessel and required installation equipment	Yes	• Submerged, external surfaces of the vessel may have biofouling; and • Mobilised equipment required for works may have biofouling or residues from previous work in other water bodies.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule;	Installation contractor/vessel operator

Activity	Task	Risk (Is there a significant risk of this task introducing INNS?)	Justification (Explain risk, if there is a risk, describe it here)	CCP (Are control measures most effectively applied at this stage?)	Control Measure (What control measures can be applied to this task?)	Who (Who will carry out the control measure?)
					• Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all installation equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk. Where long-term deployment or elevated fouling risk is identified, consider additional control measures (e.g., anti-fouling or enhanced inspection).	
	2. Transport of scour protection and foundations to the WDA for installation	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with Task 1. • However, INNS may be released through ballast water exchange if this risk is not properly managed; and • External, submerged surfaces may become fouled during transit.	Yes	• Comply with the IMO (2021) regarding ballast water management and exchange. • Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit details.	Vessel Operator
	3. Installation of scour protection and foundations	No	• Equipment (deployed during Task 3 has undergone thorough inspection, cleaning, and biofouling management during mobilisation and transit (Tasks 1	No	No	N/A

Activity	Task	Risk (Is there a significant risk of this task introducing INNS?)	Justification (Explain risk, if there is a risk, describe it here)	CCP (Are control measures most effectively applied at this stage?)	Control Measure (What control measures can be applied to this task?)	Who (Who will carry out the control measure?)
			and 2). This significantly reduces the risk of introducing INNS.			
	4. Return to port and demobilise	Yes	• Biofouled external, submerged surfaces and/or equipment and tools may transfer INNS to future work locations and/or ports.	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and • Inspect, clean, disinfect, and dry all installation equipment/tools after use, focusing on removal of fouling and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	Installation contractor/ vessel operator
Installation of the WTGs and OSP topsides	1. Mobilise vessel and required installation equipment	Yes	• Submerged, external surfaces of the vessel may have biofouling; and • Mobilised equipment required for works may have biofouling or residues from previous work in other water bodies.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule; • Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all installation equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk.	Installation contractor/vessel operator

Activity	Task	Risk (Is there a significant risk of this task introducing INNS?)	Justification (Explain risk, if there is a risk, describe it here)	CCP (Are control measures most effectively applied at this stage?)	Control Measure (What control measures can be applied to this task?)	Who (Who will carry out the control measure?)
					Where long-term deployment or elevated fouling risk is identified, consider additional control measures (e.g., anti-fouling or enhanced inspection).	
	2. Transit to the WDA	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with Task 1; • However, INNS may be released through ballast water exchange if this risk is not properly managed; and • External, submerged surfaces may become fouled during transit.	Yes	• Comply with the IMO (2021) regarding ballast water management and exchange; • Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit details.	Vessel operator
	3. WTG and OSP topside installation	No	• Equipment deployed during Task 3 has undergone thorough inspection, cleaning, and biofouling management during mobilisation and transit (Tasks 1 and 2). This significantly reduces the risk of introducing INNS.	No	No	N/A
	4. Demobilisation of vessels and equipment	Yes	• Biofouled external, submerged surfaces and/or equipment and tools may transfer INNS to future work locations and/or ports.	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and • Inspect, clean, disinfect, and dry all installation equipment/tools after use, focusing on removal of fouling	Installation contractor/ vessel operator

Activity	Task	Risk (Is there a significant risk of this task introducing INNS?)	Justification (Explain risk, if there is a risk, describe it here)	CCP (Are control measures most effectively applied at this stage?)	Control Measure (What control measures can be applied to this task?)	Who (Who will carry out the control measure?)
					and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	
Installation of subsea cable infrastructure (including external cable protection)	1. Mobilise vessels and required equipment, load out required cable infrastructure	Yes	• External, submerged surfaces of the vessel may have biofouling; • Equipment/tools required for cable infrastructure installation may have been used at other locations with similar environmental conditions and may have biofouling; and • Prefabricated cable protection may be contaminated/fouled with organisms.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule. Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk. Where long-term deployment or elevated fouling risk is identified, consider additional control measures (e.g., anti-fouling or enhanced inspection).	Installation contractor/vessel operator
	2. Transit to the WDA / Offshore ECC	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with Task 1; • However, INNS may be released through ballast water exchange if	Yes	• Comply with the IMO (2021) regarding ballast water management and exchange; • Minimise anchorage exposure during transit, particularly in high-risk areas; and	Vessel operator

Activity	Task	Risk (Is there a significant risk of this task introducing INNS?)	Justification (Explain risk, if there is a risk, describe it here)	CCP (Are control measures most effectively applied at this stage?)	Control Measure (What control measures can be applied to this task?)	Who (Who will carry out the control measure?)
			this risk is not properly managed; and • External, submerged surfaces may become fouled during transit.		• Log transit details.	
	3. Deploy and install the offshore cables	No	• No additional INNS risk is identified for this task, as the risk is addressed through the control measures implemented during Task 1. All relevant inspections, cleaning, and biofouling management are conducted prior to deployment, effectively mitigating the potential for INNS introduction.	No	No	N/A
	4. Deploy external cable protection at defined locations	No	• No additional INNS risk is identified for this task, as the risk is addressed through the control measures implemented during Task 1. All relevant inspections, cleaning, and biofouling management are conducted prior to deployment, effectively mitigating the potential for INNS introduction	No	No	N/A
	5. Post-installation testing and demobilisation	Yes	• Post installation work, the vessel and equipment may have residue biofouling and will re-enter ports and/or be used on other sites.	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and • Inspect, clean, disinfect, and dry all installation equipment/tools after	Installation contractor/vessel operator

Activity	Task	Risk (Is there a significant risk of this task introducing INNS?)	Justification (Explain risk, if there is a risk, describe it here)	CCP (Are control measures most effectively applied at this stage?)	Control Measure (What control measures can be applied to this task?)	Who (Who will carry out the control measure?)
					use, focusing on removal of fouling and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	

Table 6.5 CCPs and control measures identified as necessary for O&M activities

Activity	Task	Risk	Justification	CCP	Control Measure	Who
Routine inspections*	1. Mobilise vessel and required equipment	Yes	• Vessels and inspection equipment may be biofouled from previous works or time spent at port.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule. Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk.	Maintenance contractor /vessel operator
	2. Transit to the WDA / Offshore ECC	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with the prior task; • However, INNS may be released through ballast water exchange if this risk is not properly managed; and	Yes	• Comply with the IMO (2021) regarding ballast water management and exchange; • Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit details.	Vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
			• External, submerged surfaces may become fouled during transit.			
	3. Deploy divers and/or inspection equipment (ROVs)	No	• All equipment/tools required for routine inspection works have been inspected and clean, as needed, during mobilisation (Task 1). Therefore, this task is unlikely to carry a risk of INNS introduction because of the prior CCPs and control measures.	No	No	N/A
	4. Undertake inspection activities	No	• Inspection activities will use pre-inspected and clean equipment (Task 1).	No	No	N/A
	5. Recover all inspection equipment and demobilise	Yes	• Used equipment may have biofouling present, which may be transferred to port or other sites.	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and • Inspect, clean, disinfect, and dry all equipment/tools after use, focusing on removal of fouling and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	Survey contractor/vessel operator
Repairs and replacements**	1. Mobilise vessels and required equipment	Yes	• Vessels and equipment used for repair and replacement works may be biofouled from previous work or visited ports.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule. Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore,	Maintenance team/vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
					onboard the vessel as needed to manage fouling risk.	
	2. Transit to the WDA / Offshore ECC	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with the prior task; • However, INNS may be released through ballast water exchange if this risk is not properly managed; and • External, submerged surfaces may become fouled during transit.	Yes	• Comply with the IMO (2021) regarding ballast water management and exchange; • Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit details.	Vessel operator
	3. Deployment of repair equipment	No	• All maintenance equipment has been inspected and treated during mobilisation (Task 1). Therefore, deployment presents no new risk of INNS introduction if prior control measures have been implemented.	No	No	Maintenance team
	4. Perform repair or replacement	No	• Maintenance takes place in a defined location using pre-checked equipment (Task 1); and • Maintenance equipment is in continuous controlled use.	No	No	N/A
	5. Equipment recovery and demobilisation	Yes	• During use maintenance equipment/tools may have been exposed to biofouling and/or seawater. As such, there is the potential risk of INNS transfer to port or subsequent sites.	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and • Inspect, clean, disinfect, and dry all equipment/tools after use, focusing on removal of fouling and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	Maintenance team/vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
Removal of marine growth from WTGs and OSPs above and below the water line	1. Mobilise vessels and required cleaning equipment	Yes	• Vessels and cleaning equipment (brushes, water jets, scrapers, and ROVs) may be biofouled from previous work at different sites with similar environmental conditions.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule. Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk.	Maintenance team/vessel operator
	2. Transit to the WDA	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with the prior task; • However, INNS may be released through ballast water exchange if this risk is not properly managed; and • External, submerged surfaces may become fouled during transit.	Yes	• Comply with the IMO (2021) regarding ballast water management and exchange; • Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit details.	Vessel operator
	3. Deployment of cleaning equipment	No	• Cleaning equipment has been inspected and treated during mobilisation (Task 1); and • Deployment alone does not release marine growth or risk INNS introduction risk.	No	No	N/A
	4. Removal of marine growth	Yes	• Despite cleaning equipment being confirmed as free from biofouling, this task dislodges and releases biofouling organisms/material into the water column.	Yes	• Where practicable, conduct cleaning operations during slack or low tidal flow conditions to minimise dispersal of dislodged material; • Prioritise targeted cleaning techniques, such as high-pressure water jets, to reduce unnecessary disturbance;	Maintenance team

Activity	Task	Risk	Justification	CCP	Control Measure	Who
					• Avoid mechanical over-scouring of surfaces to limit the potential for future biofouling; • Where feasible, use containment methods (e.g., mesh or netting) around the cleaning area to capture larger dislodged material; • Remove equipment/components from the water, where possible, for ex-situ cleaning on the vessel's deck to allow controlled collection and disposal; • Ensure all collected marine growth is disposed of following biosecurity and waste management protocols to prevent secondary INNS spread; • Schedule cleaning, where practicable, to avoid sensitive ecological periods, such as spawning seasons; and • Maintain detailed records of cleaning activities, including methods and volumes of material removed.	
	5. Equipment recovery and demobilisation	Yes	• On completion of the task used tools and equipment may be wet and/or fouled and could transfer INNS to port or future sites.	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and • Inspect, clean, disinfect, and dry all equipment/tools after use, focusing on removal of fouling and potential INNS (if present). Maintain detailed records of equipment cleaning to ensure traceability.	Maintenance team/vessel operator

* Note that for environmental surveys described in **Table 6.3**, the same process as for routine inspections would be followed and therefore this is not repeated.

** Note that for painting and corrosion protection described in **Table 6.3**, the same process as for repairs and replacements would be followed and therefore this is not repeated.

Table 6.6 CCPs and control measures identified as necessary for decommissioning activities

Activity	Task	Risk	Justification	CCP	Control Measure	Who
Pre-decommissioning Survey	1. Mobilise vessel and required equipment	Yes	• Vessels and survey equipment may be biofouled from previous surveys/deployments.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule. Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk.	Survey contractor/ vessel operator
	2. Transit to the WDA	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with the prior task; • However, INNS may be released through ballast water exchange if this risk is not properly managed; and	Yes	• Comply with the IMO guidelines (2021) regarding ballast water management and exchange; • Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit details.	Vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
			• External, submerged surfaces may become fouled during transit.			
	3. Undertake pre-decommissioning survey and clearance activities	No	• All survey equipment has been inspected and treated during mobilisation (Task 1). Therefore, deployment presents no new risk of INNS introduction if prior control measures have been implemented; • Survey takes place in a defined location using pre-checked equipment (Task 1); and • Survey equipment is in continuous controlled use.	No	No	N/A
	4. Return to port and demobilise	Yes	• On retrieval of the survey equipment, it may be biofouled and could transfer INNS to port or subsequent sites.	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and • Inspect, clean, disinfect, and dry all equipment/tools after use, focusing on removal of fouling and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	Survey contractor/ vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
Decommissioning of the WTGs, OSPs and associated foundations	1. Mobilise vessels and required decommissioning equipment	Yes	• Vessels and equipment may be biofouled from previous operations or because of time spent at port.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule. Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk.	Decommissioning contractor/vessel operator
	2. Transit to the WDA	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control measures associated with the prior task; • However, INNS may be released through ballast water exchange if this risk is not properly managed; and	Yes	• Comply with the IMO (2021) regarding ballast water management and exchange; • Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit	Vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
			• External, submerged surfaces may become fouled during transit.			
	3. Removal of WTGs, OSPs and associated foundations (process would be the reverse of construction)	Yes	• WTGS, OSPs and associated foundations have been in-situ for long periods of time and therefore are likely to have some degree of biofouling present. Disturbance and/or disassembly of these structures may therefore release biofouling organisms into the wider environment.	Yes	• Conduct pre-work inspections of the WTGs, OSPs and associated foundations to determine the degree of biofouling present, conduct removal of marine growth works if needed; • If practicable, conduct works in slack or low tidal flow conditions; • Reduce physical disturbance as far as practicable through good practice decommissioning procedures; and • Visually monitor for significant biofouling release.	Decommissioning contractor
	4. Transport the WTGs, OSPs and foundations to designated port for decommissioning and recycling onshore	No	• The previous control measures implemented at CCPs for this activity will address the potential for biofouling release from the WTGs and foundations.	No	No	N/A
	5. Demobilisation of vessel and decommissioning equipment	Yes	• Vessels and equipment used for the decommissioning of the WTGs may be fouled, and therefore risk transferring	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and	Decommissioning contractor/vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
			INNS to port or other work sites.		• Inspect, clean, disinfect, and dry all equipment/tools after use, focusing on removal of fouling and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	
Decommissioning of the subsea cable infrastructure (including external cable protection)	1. Mobilisation of vessels and decommissioning equipment	Yes	• Vessels and cable infrastructure removal equipment may be biofouled from previous works and/or from time spent at port.	Yes	• Review vessel maintenance schedule and ensure that AFS maintenance is up to date; • Conduct biofouling inspections and cleaning in accordance with the vessel's BFMP/maintenance schedule. Where applicable, maintain a BRB. Measures should follow relevant elements of the IMO (2023) guidance, where applicable; and • Inspect, clean, and log all equipment on land at the mobilisation port prior to loading. Conduct additional inspections offshore, onboard the vessel as needed to manage fouling risk.	Decommissioning contractor/vessel operator
	2. Transit to the WDA / Offshore ECC	Yes	• The risk of potential release of biofouling organisms has been effectively mitigated through the control	Yes	• Comply with the IMO (2021) regarding ballast water management and exchange;	Decommissioning contractor/vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
			measures associated with the prior task; • However, INNS may be released through ballast water exchange if this risk is not properly managed; and • External, submerged surfaces may become fouled during transit.		• Minimise anchorage exposure during transit, particularly in high-risk areas; and • Log transit details.	
	3. Removal of cable infrastructure	Yes	• Removal of cables and external cable protection may dislodge and release biofouling.	Yes	• If practicable, conduct works in slack or low tidal flow conditions; • Reduce physical disturbance as far as practicable through good practice decommissioning procedures; and • Visually monitor for significant biofouling release.	Decommissioning contractor/vessel operator
	4. Handling and storage of recovered cable materials for recycling onshore	Yes	• Recovered cable infrastructure and external protection systems are likely to be fouled due to their long-term deployment.	Yes	• On retrieval, materials should be inspected for biofouling; • If cleaning occurs on-deck avoid rinsing overboard; and • Store appropriately to limit cross-contamination.	Decommissioning contractor
	5. Demobilisation of vessels and decommissioning equipment	Yes	• Vessels and equipment used for the decommissioning of cable infrastructure may be fouled, and therefore risk	Yes	• Conduct thorough inspection, cleaning, and maintenance of vessels per BFMP, BRB, and maintenance schedules upon arrival at port; and	Decommissioning contractor/vessel operator

Activity	Task	Risk	Justification	CCP	Control Measure	Who
			transferring INNS to port or other work sites.		• Inspect, clean, disinfect, and dry all equipment/tools after use, focusing on removal of fouling and potential INNS (If present). Maintain detailed records of equipment cleaning to ensure traceability.	

6.5 STEP FIVE – BIOSECURITY SURVEILLANCE, MONITORING AND REPORTING PROCEDURES

64. INNS training and awareness will be tailored according to personnel roles and responsibilities:

- Key personnel directly involved in inspections, maintenance, vessel operations, or environmental management will receive training on INNS identification, biosecurity procedures and reporting procedures. This training will include access to identification guides;
- General site personnel will receive briefings or toolbox talks to raise awareness of biosecurity risks, encourage vigilance, and explain how to report any unusual sightings. These sessions will form part of broader environmental and safety inductions; and
- Training and awareness will be designed to develop a culture of continuous learning and proactive biosecurity management, ensuring that everyone on-site understands the importance of early detection and reporting.

65. INNS surveillance will be integrated into operational activities undertaken by project personnel, including contractors, subcontractors, staff, and vessel masters, and will be delivered through three complementary approaches:

- Targeted inspections at CCPs: as set out in the WDA HACCP tables (**Section 6.3**). This includes pre- and post-mobilisation vessel biofouling inspections, aligned with the vessel's BFMP, and checks on equipment prior to deployment;
- Opportunistic observations: through the embedded culture of INNS vigilance that this INNSMP aims to foster across the WDA, personnel present on-site will remain vigilant and report any potential INNS to the Biosecurity Manager.

66. Recording and reporting procedures:

- Any suspected INNS or unusual biofouling should be photographed and, if safe and practical, biological samples should be taken to aid formal identification;
- All observations should be sent as soon as practicable to the Biosecurity Manager for review and expert identification, if deemed necessary; and
- Confirmed or suspected INNS will be reported to the Marine Directorate by the Biosecurity Manager, see **Section 6.6** for further details.

6.6 STEP SIX – CONTINGENCY PLAN

67. Despite robust identification of activity specific CCPs and associated control measures to prevent the introduction and/or spread of INNS, there is always the potential for biosecurity measures to fail. In these situations, a rapid and co-ordinated response is critical to minimise the environmental and operational impact of INNS.

68. This contingency plan outlines clear, simple, and actionable steps that shall be followed in the event of a suspected or confirmed introduction of an INNS. The contingency plan is designed to be easy to follow, clearly assign responsibilities, and ensure early communication with the relevant authorities.

69. The contingency plan will be activated if any of the following scenarios occur:

- A suspected INNS is discovered on a marine vessel, infrastructure, or within the WDA;
- A marine vessel with unexpected and/or heavy biofouling not identified during initial risk assessment, is identified post-arrival;
- Notification from authorities or third-parties of a high alert INNS in the vicinity of the WDA; or
- The unscheduled arrival or weather-driven deviation of a marine vessel results in the use of emergency anchoring by an unassessed marine vessel within the WDA.

70. The contingency plan has been developed around a staged framework, with key actions associated with each stage as detailed in **Table 6.7**. Roles and responsibilities for the completion of the relevant actions are also detailed, however it is important to note that the Developer has overall responsibility for the implementation of this INNSMP.

Table 6.7 Summary of the key actions associated with each stage of the contingency plan

Action	Responsibility
Stage One – Suspected Arrival of a High Alert Species	
Isolate the affected vessel or structure (if possible) at the earliest opportunity. This could include restricting access or holding in a designated area.	Biosecurity Manager/Contractors and Sub-contractors
Collect either photographic evidence or biological samples to allow for full identification.	Biosecurity Manager/Contractors and Sub-contractors
Immediately Notify MD-LOT and NatureScot and send photograph/sample as advised. (Report to: MarineNonNativeSpecies@gov.scot and ENQUIRIES@Nature.scot).	Biosecurity Manager/ECoW
Log the incident in the Biosecurity Logbook and inform all other relevant site users as soon as possible.	Biosecurity Manager
Stage Two – Presence of High Alert Species Confirmed	
Undertake immediate containment measures, focused on restricting movement of vessels and equipment from the affected area.	Biosecurity Manager/Contractors and Sub-contractors
Carry out a rapid visual survey (e.g., ROV) to inform understanding of presence of INNS.	Biosecurity Manager/Contractors and Sub-contractors
Notify relevant stakeholders, including MD- LOT, NatureScot, and local harbour authorities as soon as possible.	Biosecurity Manager/ECoW

Action	Responsibility
Notify all relevant contractors and vessel operators that work onsite as soon as possible.	Biosecurity Manager
Ensure all other vessels have effective AFSs in place, maintenance schedules are adhered to, and the control measures are implemented.	Biosecurity Manager
Stage Three – Eradication and/or Long-term Management	
Follow guidance for species specific eradication and/or control, likely provided by MD- LOT, post notification of confirmed INNS presence.	Developer, and all persons working on their behalf within the WDA.
Review and revise biosecurity protocols based on incident findings.	Biosecurity Manager
Report findings and lessons learned to all relevant stakeholders.	Biosecurity Manager/ECoW

6.7 MONITORING AND REVIEW

6.7.1 Monitoring and Implementation of the Plan

71. Routine monitoring and record keeping will be undertaken to ensure the effective implementation of this INNSMP. The Biosecurity Manager will maintain a Biosecurity Logbook which will document the following:

- Routine inspections of vessels and infrastructure for evidence of INNS;
- Biosecurity measures taken if the INNS are suspected or confirmed onsite; and
- Awareness raising actions undertaken with personnel and contractors.

6.7.2 Plan Review

72. To ensure that the INNSMP remains fit for purpose, a full review will take place annually. This review time frame is considered appropriate to capture modifications to existing activities, or new activities that pose a low risk (**Sections 5.1** and **5.2**) of INNS introduction. In addition, if activities that are considered to carry a high risk of INNS introduction are started within the WDA across any stage of the development (construction, O&M, and decommissioning), an ad-hoc review of the INNSMP will be undertaken to assess the activities and identify CCPs and control measures, as needed, to effectively mitigate the risk.

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Appendix B: Third-party benthic subtidal survey interpretative report. Briggs Commercial Ltd (2024) Machair Windfarm development area benthic survey

Appendix C: Contaminants survey report. Furgo (2023) Machair Windfarm development area geophysical and environmental survey

Appendix D: Benthic characterisation report. Furgo (2023) Machair Windfarm development area geophysical and environmental survey

Appendix E: Environmental DNA survey interpretative report. Furgo (2023) Machair Windfarm development area geophysical and environmental survey

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