



Technical Appendix 21.1

Commitments Register

Offshore EIA Report: Volume 2

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Green Volt Offshore Windfarm

Commitments Register

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Acronyms

Acronym	Acronym description
AAP	Areas of Archaeological Potential
ABS	American Bureau of Shipping
ADD	Acoustic Deterrent Devices
AEZ	Archaeological Exclusion Zone
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
AS	Aviation Specification
BCA	Block Crossing Agreement
CAA	Civil Aviation Authority
CaP	Cable Plan
CEMP	Construction Environment Management Plan
COLREGS	International Regulations for Preventing Collisions at Sea 1972
cUXO	Confirmed Unexploded Ordnance
DECC	Department of Energy and Climate Change
DP	Decommissioning Plan

DSLP	Development Specification and Layout Plan
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EPS	European Protected Species
ERCoP	Emergency Response Co-operation Plan
ERP	Emergency Response Plan
FIR	Fishing Industry Representative
FLO	Fisheries Liaison Officer
FLOWW	The Fishing Liaison with Offshore Wind and Wet Renewables Group
FMMS	Fisheries Management and Mitigation Strategy
GPS	Global Positioning System
HAT	Highest Astronomical Tide
HDD	Horizontal Directional Drilling
HES	Historic Environment Scotland
HMR	Helicopter Main Routes
HSE	Healthy and Safety Executive
IALA	International Association of Marine Aids to Navigation
IEC	International Electrotechnical Commission

IMO	International Maritime Organisation
INTOG	Innovation and Targeted Oil & Gas
JNCC	Joint Nature Conservation Committee
LMP	Lighting and Marking Plan
MARPOL	The International Convention for the Prevention of Pollution from Ships
MCA	Maritime and Coastguard Agency
MGN	Marine Guidance Note
MINNS	Marine Invasive Non-Native Species
MMMP	Marine Mammal Mitigation Protocol
MMObs	Monitoring Requirement for Marine Mammal Observers
MoD	Ministry of Defence
MPA	Marine Protected Area
MPCP	Marine Pollution Contingency Plan
MS-LOT	Marine Scotland Licencing Operations Team
MSS	Marine Scotland Science
NAIZ	Non Auto Initiation Zone
NATS	National Air Traffic Services
NLB	Northern Lighthouse Board
NOTAM	Notice to Air Missions

NSP	Navigational Safety Plan
NSTA	North Sea Transition Authority
NtM	Notification to Mariners
NVG	Night Vision Goggle
O&G	Oil and Gas
O&M	Operation and Maintenance
OPRED-ODU	OPRED's Offshore Decommissioning Unit
OSP	Offshore Substation Platform
OWIC	Offshore Wind Industry Council
OWL	Offshore Windfarm Ltd
PAC	Pre Application Consultation
PAD	Protocol for Archaeological Discoveries
PEMP	Project Environmental Monitoring Programme
PMF	Priority Marine Feature
PS	Piling Strategy
PTS	Permanent Threshold Shift
pUXO	Potential Unexploded Ordnance
PWA	Pipeline Work Authorisation
ROV	Remote Operating Vehicles

RSPB	Royal Society for Protection of Birds
RYA	Royal Yachting Association
SAC	Special Area of Conservation
SAR	Search and Rescue
SBP	Sub Bottom Profiling
SCDS	Supply Chain Development Statement
SOLAS	International Convention for the Safety of Life at Sea 1974
SPA	Special Protection Area
TAEZ	Temporary Archaeological Exclusion Zone
TMZ	Transponder Mandatory Zone
TPV	Third Party Verification
UKHO	United Kingdom Hydrographic Office
USBL	Sparkers and Ultra Short Baseline
UV	Ultra Violet
UXO	Unexploded Ordnance
VHF	Very High Frequency
VMP	Vessel Management Plan
WAM	Wide Area Multilateration
WSI	Written Scheme of Investigation

WTG	Wind Turbine Generators
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1. Introduction

Green Volt Offshore Windfarm Ltd (the Applicant) has adopted a number of commitments as part of the Offshore Environmental Impact Assessment (EIA) process, in order to avoid or reduce adverse effects on the environment during construction, operation and maintenance and decommissioning of the Green Volt Offshore Windfarm (the Project). This document supports the **Green Volt Offshore Windfarm Offshore EIA Report** and records all the commitments that are taken forward within the **Offshore EIA Report**, and provides details on how the commitments will be secured, for example through relevant management plans.

Commitments have been informed through consultation on the Scoping Report, subsequent informal consultation with a range of key consultees and feedback from Pre Application Consultation (PAC). An overview of the consultation undertaken to date is provided within **Chapter 6: EIA Methodology of the Green Volt Offshore Windfarm Offshore EIA Report**.

1.1 Consent Plans

Table 1 details the Consent Plans proposed within this Offshore EIA Report and discussed in relevant technical chapters, and which will be developed prior to construction. In addition, an offshore Ecological Clerk of Works (ECoW) and Fisheries Liaison Officer (FLO) will be appointed to the Project, subject to confirmation by Marine Scotland Licensing Operations Team (MS-LOT). The Applicant's company environmental management systems will be translated for use in the Project and referenced within the Construction Environment Management Plan (CEMP). The final suite of consent plans and their contents will be determined by consent conditions applied to the Project by the Scottish Ministers.

Table 1 Consent plans

Consent Plan	Description
Biosecurity Plan (Offshore)	Provides details of guidance and mitigation measures to minimise the introduction and transfer of invasive non-native species.
Decommissioning Plan (DP)	Gives details of all aspects of the Project, from the associated effects the infrastructure will have on the surrounding environment to the current known methods to undertake the decommissioning.
Cable Plan (CaP)	Contains details on environmental sensitivities and design considerations to mitigate, as far as possible, the effects of export or inter-array cable laying and associated protection during installation and operation of the Project.
Emergency Response Co-operation Plan (ERCoP)	Ensures the co-operation with the Maritime and Coastguard Agency by detailing the design parameters of the Project, emergency contact details, and processes to be followed.
Fisheries Management and Mitigation Strategy (FMMS)	Details approach to undertaking pre-construction, construction, and operational works in co-operation with existing commercial fisheries activities, developed in consultation with fishing representatives
Marine Pollution Contingency Plan (MPCP)	Ensures appropriate measures and procedures are undertaken in the event of a pollution incident
Piling Strategy (PS)	Piling methods and programme are detailed and includes the mitigation of the effects on noise sensitive species.
Project Environmental	Outlines the monitoring strategy for proposed monitoring to be undertaken pre-construction, during construction and post construction. The PEMP

Consent Plan	Description
Monitoring Programme (PEMP)	will be updated to reflect Development environmental monitoring results as required.
Protocol for Archaeological Discoveries (PAD)	Provides procedures for reporting and investigation unexpected archaeological discoveries found during site investigations and construction.
Vessel Management Plan (VMP) and Navigational Safety Plan (NSP)	Provides the management and coordination of vessels to mitigate the impact of vessels.
Lighting and Marking Plan (LMP)	The plan sets out the marine and aviation navigational lighting and marking measures to be applied during the construction and operation of the Project
Written Scheme of Investigation (WSI)	A method statement that clearly details the process and approach to undertaking heritage works associated with the Project's construction.
Marine Mammal Mitigation Protocol (MMMP)	Sets out the protocol of how the Project would mitigate potential impacts to marine mammals during construction activities and meet any relevant licence conditions associated with the marine mammals. A separate MMMP will be created for piling and unexploded ordnance (UXO) related activities
Construction Environment Management Plan (CEMP)	Outlines how the construction activities for the Project will avoid, minimise or mitigate effects on the environment and surrounding area.
Development Specification and Layout Plan (DSLPL)	Sets the final design and layout parameters associated with the Offshore Development Area.
Supply Chain Development Statement (SCDS)	Will be developed following the offer of an Innovation and Targeted Oil & Gas (INTOG) Exclusivity Agreement by Crown Estate Scotland. The SCDS would be provided to Crown Estate Scotland in advance of any Option Agreement being executed.

Table 2 sets out the commitments made within the Green Volt Offshore Windfarm Offshore EIA Report, and details how the commitments will be secured. All plans will be approved by MS-LOT and other stakeholders as required, in advance of their requirement.

Table 3 sets out the monitoring proposed in the Offshore EIA Report.

Table 2 Register of commitments (and method for securing) made in the Green Volt Offshore Windfarm Offshore EIA Report

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Chapter 7: Marine Geology Oceanography & Physical Processes						
Construction	Avoid impacts to intertidal habitats	Landfall Export Cable Corridor	Horizontal Directional Drilling (HDD) will be used to connect the offshore export cable to shore to avoid disturbance to the cliffs (NorthConnect Parallel option) or dunes (St. Fergus South option), intertidal shore and nearshore seabed that would otherwise be caused by trenching (or similar intrusive installation).	yes	-	This has been confirmed during project design phase This will be secured through the CEMP
Project design	Avoid impacts to marine physical processes	Landfall Export Cable Corridor	The export cable corridors have been refined during the EIA process so that the envelope of each corridor option has been narrowed as far as practicable towards each landfall. In particular, the St. Fergus South Landfall option no longer covers the bay of St. Fergus, but is narrowed to an area further south (just north of Peterhead).	yes	-	This has been undertaken through the site selection process
Chapter 8: Marine Sediment and Water Quality						
All phases	Minimise pollution of marine environment	Offshore Development Area	All Project vessels will follow the requirements set out in The International Convention for the Prevention of Pollution from Ships (MARPOL).	yes	-	This will be secured through the MPCP, in the CEMP
Construction	Minimise drill mud discharge	Landfall Export Cable Corridor	Drill mud discharge will be kept to a minimum and will be water-based, rather than oil-based, with minimum drilling lubricants used during the final exit phase onto the seabed.	yes	-	This will be secured through the CEMP
Construction	Minimise mobilisation of sediments	Landfall Export Cable Corridor	HDD will be used to connect the Landfall Export Cable to shore to avoid disturbance to the cliffs or dunes. This also results in no potential resuspension of sediments within the intertidal and near shore area.	yes	-	This will be secured through the CEMP
Construction	Minimise pollution of marine environment	Landfall Export Cable Route (HDD drill out)	Prior to the last one to two metres of HDD drill out before punch out, the borehole will be flushed with water to minimise the risk of bentonite slurry entering the marine system.	yes	-	This will be secured through the CEMP
Construction	Avoid impacts on /cumulative impacts with dredge disposal activities	Landfall Export Cable Corridor	Localised dredge disposal sites for the Port of Peterhead have been avoided in all export cable routing options.	yes	-	This has been undertaken through the site selection process
Construction	Minimise impacts to Marine Protected Areas	Landfall Export Cable Route (HDD drill out)	Transition pits will be sited to avoid Marine Protected Areas MPAs).	yes	-	This will be secured through the CEMP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Construction	Management of potential environmental impacts	Offshore Development Area	A separate CEMP will be developed prior to construction.	yes	-	This commitment is for the CEMP
Construction	Management of co-location with abandoned in-situ infrastructure	Windfarm Site	There is no agreed legal or regulator position regarding the need to apply defined exclusion zones between decommissioned oil and gas infrastructure and newly installed wind farm assets. It is likely this stems from the fact the principles applied to oil and gas decommissioning requirements places primacy on returning the seabed to its original state for future marine users. It is also of note that considerable responsibility remains with the oil and gas operator after decommissioning with respect to any interaction with abandoned equipment left in-situ. Therefore, there should be provision to allow ongoing monitoring for potential for hazards to other users of the sea and to ensure there is recovery of the environment after decommissioning. The array pattern and position applied will deliberately avoid placing turbines and substructures directly above pipelines and umbilicals remaining in-situ, and abandoned well-centres at the seabed. The final offsets applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach. Positioning of wind farm equipment on the seabed such as moorings and inter-array cables will also avoid interaction where possible, however, there is a strong likelihood that crossings will be necessary. Such crossings will be finalised with the input and agreement with the oil and gas operator since they will be legally responsible for the notification process and the ongoing liability associated with the decommissioned equipment affected by the crossing.	yes	-	This will be secured in the DSLP, risk assessments and CaP
Construction	Minimise mobilisation of sediments	Windfarm Site	The locations of the anchors and Offshore Substation Platform (OSP) foundations will be determined in advance using survey information, therefore the location of each anchor will be chosen to avoid the need for seabed preparation. (i.e. avoid pock marks or straddling through micrositing).	yes	-	This will be secured in the DSLP
Chapter 9: Benthic Ecology						
Construction	Avoid disturbance of pock marks	Offshore Development Area (Particularly Windfarm Site)	Infrastructure will not be situated in pockmarks (where there is the potential for submarine structures from leaking gases) due to the risk of shallow gas.	yes	-	This will be secured in the DSLP
Construction	Avoid habitat and protected species disturbance	Inter-array cables, Buzzard Export Cable Route, Landfall Export Cable Route	' <i>Sabellaria spinulosa</i> and <i>Echinocyamus pusillus</i> , <i>Ophelia borealis</i> and <i>Abra prismatica</i> in Circalittoral Fine Sand' PMF are recorded during surveys along the export cable corridor between the windfarm site and the landfall, and cable routing will be micro-sited to avoid impacts on these features.	yes	-	This will be secured through the CaP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Construction	Avoid habitat and protected species disturbance	Inter-array cables, Buzzard Export Cable Route, Landfall Export Cable Route	A CaP will be developed to set out the installation programme, methods, cable technical specifications, cable burial risk assessment, and management measures for EMF attenuation, for both the export cables and inter-array cables. It will also include any mitigation measures for environmental and navigational issues. The avoidance of sensitive benthic habitats/species and species/habitats of conservation importance will be a key consideration in the detailed design of the final cable routes.	yes		This commitment is for the CaP
Construction	Reduce introduction of hard substrate into the marine environment	Offshore Development Area	Cables will be buried, where possible, for both the inter-array and export cables. This strategy aims to reduce the need for additional cable protection, and therefore the amount of hard substrate required. Should any sections of the marine cable require additional protection following combined lay/burial operation, then this will be provided by post lay jet burial (if possible), engineered, localised rock placement or concrete mattressing. Sections of cable may also be fitted with additional cast iron or synthetic external cladding to provide localised protection in certain areas.	yes	-	This will be secured through the CaP
Construction	Management of potential environmental impacts	Offshore Development Area	A separate CEMP will be developed prior to construction.	yes	-	This commitment is for the CEMP
Construction	Preventing Accidental Release of Contaminants	Offshore Development Area	A MPCP in the CEMP will set out the management measures to be implemented during construction, operation and decommissioning to mitigate the risks of accidental spills of hazardous materials, measures to prevent spills, as well as remedial actions and response measures to be used in the event of a spill or collision. It will also detail measures for refuelling at sea.	yes	-	This will be secured through the MPCP, in the CEMP
Construction	Preventing Spread of Marine Invasive Non-Native Species (MINNS)	Offshore Development Area	Biosecurity plans will be in place including adhering to best practice guidelines for activities such as bilge pumping and use of antifouling. Training on MINNS will be provided to contractors conducting operation and maintenance tasks so that common MINNS can be recognised, and steps to take if such species are observed on moorings to prevent further spread. Should MINNS be identified as part of the offshore Project activities, a management and monitoring plan will be developed to measure the impact of any steps taken to prevent further spread and to reduce MINNS presence.	yes	-	This commitment is for a Biosecurity Plan
Construction	Management of co-location with abandoned in-situ infrastructure	Windfarm Site	The array pattern and position applied will deliberately avoid placing turbines and substructures directly above pipelines and umbilicals remaining in-situ, and abandoned well-centres at the seabed. The final offsets applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach. Positioning of wind farm equipment on the seabed such as moorings and inter-array cables will also avoid interaction where possible, however, there is a strong likelihood that crossings will be necessary. Such crossings will be finalised with the input and agreement with the oil and gas operator since they will be legally responsible for the notification process and the ongoing liability associated with the decommissioned equipment affected by the crossing.	yes	-	This will be secured in the DSLP, risk assessments and CaP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Chapter 10: Fish and Shellfish Ecology						
Project Design	Avoid impacts to sensitive habitats	Offshore Development Area	Through completion of site-specific surveys and review of previous survey data, site selection of the Windfarm Site and Landfall Export Cable Corridor has been undertaken to avoid key commercial fisheries and protected fish species and habitats (e.g. Priority Marine Features (PMFs), spawning areas and sites designated for fish and shellfish interests such as rivers designated as Special Areas of Conservation (SACs) for diadromous fish) as far as possible.	yes	-	This has been undertaken through the site selection process
Construction	Minimise Electromagnetic Fields (EMF) impacts to fish and shellfish	Landfall Export Cable Route and Buzzard Export Cable Route	Cables, wherever possible, will be buried to a target depth of 0.6-1.5m in accordance with DECC Guidelines (2011) which will reduce the potential for impacts relating to EMF.	yes	-	This will be secured through the CaP
Construction	Minimise EMF impacts to fish and shellfish	Offshore Development Area	Cables will be specified to reduce EMF emissions as per industry standards and best practice such as the relevant International Electrotechnical Commission (IEC) specifications.	yes	-	This will be secured through the CaP
Construction	Minimise habitat disturbance for fish and shellfish	Landfall Export Cable Route and Buzzard Export Cable Route	To minimise the extent of any unnecessary habitat disturbance, material displaced as a result of cable burial activities will be back filled, if required, in order to ensure sufficient cable burial is achieved.	yes	-	This will be secured through the CaP
Construction	Minimise underwater noise impacts to fish and shellfish	Windfarm Site	A Piling Strategy for the single OSP installation will be submitted to MS-LOT for approval prior to the commencement of piling outlining any mitigation and management measures that will be implemented during pile installation.	yes	-	This commitment is for the Piling Strategy
Construction	Minimise underwater noise impacts to fish and shellfish	Windfarm Site	During piling for the single OSP, standard operation for installing monopiles i.e. soft starts will be used, with lower hammer energies used at the beginning of the piling sequence before increasing energies to the higher levels. This measure will reduce the risk of injury to fish species in the immediate vicinity of piling operations. The use of acoustic deterrent devices (ADD) will be discussed with the relevant stakeholders and will be implemented through the MMMP.	yes	-	this will be secured through the Piling Strategy and the MMMP
Chapter 11: Marine Mammal Ecology						
Pre construction	Minimise impacts to marine mammals	Offshore Development Area	<p>A detailed MMMP will be prepared for UXO clearance during the pre-construction phase. The MMMP for UXO clearance will ensure there are adequate mitigation measures to minimise the risk of any physical or permanent auditory injury to marine mammals as a result of UXO clearance.</p> <p>The MMMP for UXO clearance will be developed in the pre-construction period, when there is more detailed information on the UXO clearance which could be required and the most suitable mitigation measures, based upon best available information and methodologies at that time. The MMMP for UXO clearance will be prepared in consultation with Marine Scotland and NatureScot.</p> <p>The MMMP for UXO clearance will include details of all the required mitigation measures to minimise the potential risk of PTS as a result of underwater noise</p>	yes	-	This will be secured through the MMMP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
			during UXO clearance. This would consider the options, suitability and effectiveness of mitigation measures such as, but not limited to: <ul style="list-style-type: none"> • Low-order clearance techniques, such as deflagration • The use of bubble curtains if any high-order detonation is required (taking into consideration the environmental limitations) • Monitoring requirements for marine mammal observers (MMObs) • Requirements for ADD • Other UXO clearance techniques, such as avoidance of UXO; or relocation of UXO. If more than one high-order detonation is required, other measures such as the use of scare charges; or multiple detonations, if UXO are located in close proximity, will also be considered. 			
Construction	Minimise underwater noise impacts to marine mammals	Windfarm Site	Soft-start and ramp-up (part of MMMP) for Piling Activities for single OSP <ul style="list-style-type: none"> • Each piling event would commence with a soft-start at a lower hammer energy followed, by a gradual ramp-up for at least 20 minutes to the maximum hammer energy required. The soft-start and ramp-up allows mobile species to move away from the area before the maximum hammer energy with the greatest noise impact area is reached. •The MMMP for piling would also outline any other mitigation measures required to reduce the risk of physical or auditory injury to marine mammals from underwater noise during piling. 	yes	-	This will be secured through the Piling Strategy and the MMMP
Construction	Minimise underwater noise impacts to marine mammals	Windfarm Site	Piling Strategy for the single OSP installation which will be submitted to MS-LOT for approval prior to the commencement of piling outlining any mitigation and management measures that will be implemented during pile installation	yes	-	This will be secured through the Piling Strategy
Construction	Minimise EMF impacts to marine mammals	Buzzard Export Cable Route and Landfall Export Cable Route	Cables, wherever possible, will be buried to a target depth of 0.6-1.5m in accordance with DECC Guidelines (2011) which will reduce the potential for impacts relating to EMF.	yes	-	This will be secured through the CaP
Construction	Minimise EMF impacts to marine mammals	Buzzard Export Cable Route and Landfall Export Cable Route	Cables will be specified to reduce EMF emissions as per industry standards and best practice such as the relevant IEC specifications.	yes	-	This will be secured through the CaP
Construction	Minimise impacts to marine mammals	Offshore Development Area	The MPCP in the CEMP will set out the management measures to be implemented during construction, operation and decommissioning to mitigate the risks of accidental spills of hazardous materials, measures to reduce instances of spills, remedial action and response measures to be used in the event of a spill or collision, and detail measures for refuelling at sea.	yes	-	This will be secured through the MPCP in the CEMP
Construction	Minimise impacts to marine mammals	Offshore Development Area	If required, mitigation for geophysical surveys (particularly if using sub bottom profiling (SBP), Sparkers and Ultra Short Baseline (USBL)) will follow the Joint Nature Conservation Committee (JNCC) (2017) ' <i>Guidelines for Minimising the Risk of Injury to Marine Mammals from Geophysical Surveys</i> ' for seismic surveys	yes	-	This will be secured through the European Protected Species (EPS) licence

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Construction	Minimise impacts to marine mammals	Windfarm Site	<p>The MMMP for piling for the single OSP installation will be developed in the pre-construction period and based upon best available information, methodologies, industry best practice, latest scientific understanding, current guidance and detailed project design. The MMMP for piling will be developed in consultation with Marine Scotland and NatureScot, detailing the proposed mitigation measures to reduce the risk of any physical or permanent auditory injury / change in hearing sensitivity (Permanent Threshold Shift (PTS)) to marine mammals during all piling operations.</p> <p>This will include details of the embedded mitigation, for the soft-start and ramp-up, as well as details of the mitigation zone and any additional mitigation measures required in order to minimise potential impacts of any physical injury or PTS, for example, the activation of ADD prior to the soft-start.</p>	yes	-	This will be secured through the MMMP
Construction	Minimise risk of collision with marine mammals	Offshore Development Area	<p>Vessel movements, where possible, will be incorporated into recognised vessel routes, and therefore to areas where marine mammals are accustomed to vessels, in order to reduce any increased collision risk. All vessel movements will be kept to the minimum number that is required to reduce any potential for collision risk. Additionally, all vessel operators will use good practice to reduce any risk of collisions with marine mammals, this includes following the Scottish Marine Wildlife Watching Code while transiting to and from site. This will be detailed within the CEMP</p>	-	yes	These will be secured in the VMP and the CEMP
Construction	Minimise risk of entanglement	Windfarm Site	<p>The PEMP will include for monitoring for entanglement risk. This will include:</p> <ul style="list-style-type: none"> • Surveys: the WTG and moorings would be regular checked by Remote Operating Vehicles (ROV) (approximately 15 times annually for both planned and unplanned maintenance activities); • This would ensure that there was no material such as discarded nets, ropes or other debris which could increase the risk of entanglement for marine mammals, or interfere with the optimal operation of the Wind Turbine Generators (WTGs). Surveys would be carried out according to American Bureau of Shipping (ABS) rules and standards. This technique is currently being used on Kincardine Offshore Windfarm, which has not found any entanglement events to date. • Monitoring for large strains on mooring lines; • On Kincardine Offshore Windfarm this has to date been undertaken by load cells attached to the mooring devices and subsea cables, designed to alert if there is unexpected load on the devices which can then be examined. The monitoring method is in the process of changing to using position monitoring system, which will identify the associated drag function on the structures outside the normal operating range. <p>The method used will be agreed with NatureScot and Marine Scotland, and take account results of the two methods being used at Kincardine Offshore Windfarm to inform the most appropriate technique at the time of deployment of the Project.</p> <p>In the event that any entanglement of a marine mammal does occur through the</p>	-	yes	This will be secured in the PEMP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
			operation of the Project, additional management and monitoring measures may be required to ensure it does not happen again.			
Chapter 12: Offshore and Intertidal Ornithology						
Site selection	To minimise impacts to bird species	Windfarm Site	Initial site selection process for the windfarm site. An initial site selection assessment was undertaken using the recently (Cleasby <i>et al.</i> 2018) published Royal Society for Protection of Birds (RSPB) Hotspot mapping GIS data layers. These data were used to help support the selection of the windfarm site over sites to the west and due east of the Buzzard oil platform. These data suggested higher seabird numbers than the Windfarm Site and therefore the site was selected. Additionally, in 2019, the site was outside the maximum foraging range for Kittiwake from any Scottish bird colony.	yes	-	This has been undertaken through the Site Selection process
All phases	Monitor and validate the impacts predicted within the ornithology chapter.	Offshore Development Area	Development of and adherence to a PEMP, which will set out commitments to environmental monitoring in pre-, during and post-construction Project phases.	yes	-	This commitment is for the PEMP
All phases	Reduce the spatial extent and magnitude of impact from disturbance and displacement of construction and maintenance vessels.	Offshore Development Area	Development of and adherence to a VMP. The VMP will confirm the types and numbers of vessels that will be engaged on the Project and consider vessel coordination including indicative transit route planning. Reduce the spatial extent and magnitude of impact from disturbance and displacement of construction and maintenance vessels.	yes		This commitment is for the VMP
All phases	To minimise impacts to cliff nesting birds at the SPA	NorthConnect Parallel Landfall	HDD works at the NorthConnect Parallel landfall option (if chosen) will be undertaken outside the bird breeding season (Apr-Aug incl) to avoid disturbance of cliff nesting birds in the Buchan Ness to Collieston Coast Special Protection Area (SPA)	yes	-	This will be secured through the CEMP
All phases	Minimise the risk of birds becoming attracted to or disorientated by WTGs at night or in poor weather	Windfarm Site	Development of and adherence to a LMP. The LMP will confirm compliance with legal requirements with regards to shipping, navigation and aviation marking and lighting.	yes	-	This commitment is for the LMP
Chapter 13: Commercial Fisheries						
Site selection	Minimise impacts to commercial fishing industry	Windfarm Site	Site selection and consultation process has led to removal of the southeast corner of the Windfarm Site due to its importance to the commercial fishing industry.	yes	-	This has been undertaken through the Site Selection process

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
All phases	Minimise impacts to commercial fishing industry	Offshore Development Area	<p>Safety Zones will be applied for by the Project as per relevant legislation to mitigate any potential impacts and to ensure safe and effective construction, Operation and Maintenance (O&M) of the wind farm. Safety zones for construction, major O&M and decommissioning will be agreed with MS-LOT and located around any structure where construction work is underway, partially completed structures where work is not underway and completed structures. These are likely to include:</p> <ul style="list-style-type: none"> • 500m radius Safety Zone around each turbine location during the construction phase; and • 50m radius Safety Zone around each turbine location during the operation phase <p>Section 95 and Schedule 16 of the Energy Act 2004 set out the basic requirements for applying for a safety zone to be placed around or adjacent to an Offshore Renewable Energy Installation (OREI). The Electricity (Offshore Generating Substations) (Safety Zones) (Applications Procedures and Control of Access) Regulation 2007 clarify the requirements for applications which applies to territorial waters in or adjacent to Scotland and within the Renewable Energy Zone.</p> <p>As of 1 April 2017, the application process for safety zones within Scottish waters has been devolved from the Department of Business, Energy, and Industrial Strategy (BEIS) to MS-LOT. An application will be made to MS-LOT accompanied by a layout plan, a summary of the construction programme and construction method statement documents, and also the proposed methodology for notifying relevant stakeholders.</p>	yes	-	This will be secured through the NSP
All phases	Minimise impacts to commercial fishing industry	Offshore Development Area	<p>Guard vessels will also be used where applicable to ensure adherence with Safety Zones or advisory passing distances to mitigate impacts which pose a risk to surface navigation during construction, O&M and decommissioning phases. Guard vessels may be required for the Proposed Development, at particular times, for example when vessels are particularly vulnerable due to partially completed works or a particular construction activity.</p> <p>During these periods, the construction area will be monitored by guard vessel(s) to further protect the area and to provide additional information to third-party vessels.</p> <p>The decision(s) on when to use a guard vessel will be informed by a risk assessment of the activities.</p> <p>A guard vessel may also be required to monitor safety zones noting this will be further assessed as part of the safety zone application.</p>	yes	-	This will be secured through the NSP
All phases	Minimise impacts to commercial fishing industry	Offshore Development Area	<p>The Project will additionally ensure that there are appropriate communications to inform other marine users of the progression of the works and the notification of significant construction events which have the potential to temporarily restrict areas for safety purposes. These measures are detailed in Chapter 16: Shipping and Navigation and will include:</p> <ul style="list-style-type: none"> • A marine coordination centre to monitor vessels contracted by the Project and other marine vessels. This centre will be monitored 24/7 and enable other marine users to contact personnel associated with the Project about any identified issues. 	yes	-	This will be secured through the VMP and NSP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
			<ul style="list-style-type: none"> • Notifications to Mariners (NtMs) will be issued to provide updates to other marine users of the construction works that are currently being undertaken and any planned in the near future. Any persons can be added to the NtM distribution list as required. • A notification will be produced in the fortnightly Kingfisher news bulletin or when a significant construction event is planned to occur with the Project. • Any cardinal or marker buoys associated with the Project will be communicated to the necessary stakeholders and informed through NtMs, United Kingdom Hydrographic Office (UKHO) and NLB. The information will include detailed maps and coordinates to enable the continuing navigational safety for other marine users. • Details will be provided to UKHO to facilitate appropriate marking of Project infrastructure on appropriate UKHO Admiralty Charts. • The UKHO will be notified of both the commencement (within two weeks), progress and completion of offshore construction works (within two weeks) to allow marking of all installed infrastructure on nautical charts. • Sharing of as-built cable information through UKHO updates and KIS-ORCA (https://kis-orca.org/), including the locations of buried cables and locations of rock protection. • Should any cable exposures be identified during the O&M phase, the location of the exposure will be shared with fisheries stakeholders, and temporary safety measures implemented. 			
Construction	Minimise impacts to commercial fishing industry	Offshore Development Area	A qualified FLO has been appointed by the Project to liaise with the fishing industry during the construction phase. Fisheries liaison will be undertaken in line with good practice guidance where possible, including Recommendations For Fisheries Liaison: Best Practice' guidance for offshore renewable developers (FLOWW 2014 and 2015). Liaison will additionally be supported by the Project Fishing Industry Representative (FIR).	yes		This will be secured through the FMMS
All phases	Minimise impacts to commercial fishing industry	Offshore Development Area	As detailed in Chapter 14: Shipping and Navigation , a series of plans will be developed to protect other marine users, including: <ul style="list-style-type: none"> • VMP; • NSP; • MPCP; • DSLP; and • LMP. 	yes	-	This commitment is for the VMP; NSP, MPCP, DSLP, LMP
Construction	Minimise impacts to commercial fishing industry	Offshore Development Area	A FMMS will be developed.	yes	-	This commitment is for the FMMS

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Construction	Minimise impacts to commercial fishing industry	Offshore Development Area	All vessels will follow the International Regulations for Preventing Collisions at Sea 1972 (COLREGS) and International Convention for the Safety of Life at Sea 1974 (SOLAS); Aids to navigation (marking and lighting) will be deployed in accordance with the latest relevant available standard industry guidance and as advised by Trinity House, Maritime and Coastguard Agency (MCA) and Civil Aviation Authority (CAA) and Ministry of Defence (MoD) as appropriate.	yes	-	This will be secured through the VMP and NSP
Construction	Minimise impacts to commercial fishing industry	Offshore Development Area	Any cardinal or marker buoys associated with the Project will be communicated to the necessary stakeholders and informed through NtMs and UKHO and Northern Lighthouse Board (NLB). The information will include detailed maps and coordinates to enable the continuing navigational safety for other marine users.	yes	-	This will be secured through the VMP and NSP
Construction	Minimise impacts to commercial fishing industry	Offshore Development Area	The Applicant plans to avoid any interactions with fishing equipment, such as creels, during all marine works. However, compensation packages to offset any losses may be available in relevant and appropriate situations. Such packages were offered during the inshore environmental survey works in April 2022 but were not required.	yes	-	This will be secured through the FMMS
Construction	Minimise impacts to commercial fishing industry	Landfall Export Cable Route and Buzzard Export Cable Route	Cables will be installed and maintained in line with good practice guidance.	yes	-	This will be secured through the CaP
Construction	Minimise impacts to commercial fishing industry	Landfall Export Cable Route and Buzzard Export Cable Route	Cables will be buried where possible. Where this is not possible due to seabed conditions, and external protection is required, the rock berm height and slope will be designed to provide the correct level of protection and long-term stability. In areas where fishing activity is likely, the Applicant will engage with relevant stakeholders to ensure berm design is suitable, accounting for potential impacts to commercial fisheries.	yes	-	This will be secured through the CaP
Construction	Minimise impacts to commercial fishing industry	Offshore development Area	Assessments will be undertaken post-installation to determine cable burial status (including cable protection) and identify potential changes to seabed conditions. Post cable installation survey data will be reviewed to confirm cable burial status and confirm any areas of cable protection are within specification (e.g. cable crossings). The findings will then be shared with the fishing industry. Recommendations by fishing industry representatives will be considered as appropriate, based on activity levels and the importance of specific areas to the fishing industry. Overtrawl trials will be considered where key fishing areas are identified along the export cable route, as appropriate.	yes	-	This will be secured through the CaP
Construction	Minimise impacts to commercial fishing industry	Landfall Export Cable Route	Should creeling vessels be required to be removed/relocate during the construction phase, vessels affected will be offered cooperation agreements in line with FLOWW best practice guidance.		yes	This will be secured through the FMMS
Chapter 14: Shipping and Navigation						

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Application to Marine Scotland for safety zones around structures as per relevant legislation (Energy Act 2004 and Electricity Regulations 2007).	yes	-	This will be secured through the NSP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Implementation and monitoring of cable protection. This will include via burial, or external protection where adequate burial depth as identified via risk assessment is not feasible.	yes	-	This will be secured through the CaP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	The layout of structures will be agreed with MCA and NLB as part of the DSLP process. This will include consideration of Search and Rescue (SAR) and surface navigation.	yes	-	This will be secured through the DSLP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Provision of details to UKHO to facilitate appropriate marking of Project infrastructure on appropriate UKHO Admiralty Charts.	yes	-	This will be secured through the NSP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Use of guard vessel(s) where necessary as identified by risk assessment.	yes	-	This will be secured through the NSP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	LMP setting out how the Project will be lit and marked in agreement with NLB and in line with International Association of Marine Aids to Navigation (IALA) Guidance G1162/R139 (IALA, 2021). This will include agreement on any construction buoyage requirements.	yes	-	This commitment is for the LMP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Marine coordination and communication for the purposes of managing project vessel movements.	yes	-	This will be secured in the VMP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Implementation of a MPCP.	yes	-	This commitment is for the MPCP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Compliance with the Regulatory Expectations on Moorings for Floating Wind and Marine Devices, in particular independent Third Party Verification (TPV) and monitoring / tracking.	yes	-	This will be secured through the NSP and DSLP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Compliance with MGN 654 and its annexes including SAR annex 5 (MCA, 2021) and completion of a SAR checklist.	yes	-	This will be secured through the NSP and DSLP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Minimum blade clearance of 22m above mean sea level (in line with Royal Yachting Association (RYA) policy (RYA, 2019) and Marine Guidance Note (MGN) 654 (MCA, 2021)).	yes	-	This will be secured in the DSLP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Implementation of a NSP setting out the navigational safety measures that will be in place during the construction and operational phases.	yes	-	This commitment is for a NSP
Construction	Minimise risk to shipping and navigation	Offshore Development Area	Compliance of all project vessels with international marine regulations as adopted by the Flag State, notably COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974).	yes	-	This will be secured through the NSP and VMP
Construction	minimise risk to shipping and navigation	Offshore Development Area	Promulgation of information via all usual means (e.g., Kingfisher Bulletins, Notifications to Mariners).	yes	-	This will be secured through the NSP and VMP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Construction	minimise risk to shipping and navigation	Offshore Development Area	Implementation of a VMP to ensure Project vessel movements are managed to minimise disruption to third party vessels.	yes	-	This commitment is for the VMP
Operation and Maintenance	minimise risk to vessel to structure collision	Windfarm Site	Vessel plotter overlay provision and guidance	-	yes	This will be secured through the NSP
Operation and Maintenance	minimise risk to under keel clearance on mooring lines	Windfarm Site	Post construction validation of available underkeel clearance available over mooring lines in liaison with MCA and NLB.	-	yes	This will be secured through the NSP
Chapter 15: Offshore Archaeology and Cultural Heritage						
Construction	Avoid impact to heritage assets	Offshore Development Area	For archaeologically significant anomalies that are clearly identifiable in the survey data and where the extents are largely known, Archaeological Exclusion Zones (AEZs) have been recommended. AEZs will remain for the life of the project or until ground truthing or higher resolution data determines a reduction in potential, significance, or extents.	yes	-	This will be secured in the WSI
Construction	Avoid impact to heritage assets	Offshore Development Area	Where an anomaly is not visible in the survey data but likely to exist on the seabed at a known position or where the extents of an anomaly are not fully identifiable, Temporary AEZs (TAEZs) will be recommended. TAEZs have been identified as highly likely to be altered following higher resolution or full coverage data assessment, however, they will remain in place until alterations have been formally agreed.	yes	-	This will be secured in the WSI
Construction	Avoid impact to heritage assets	Offshore Development Area	Areas of Archaeological Potential (AAP) are primarily reserved for magnetic anomalies where, due to line spacing, positions are not accurately known. AAPs demonstrate that there is potentially an anomaly of archaeological significance around the given position. The anomaly is likely to be identified following higher resolution or full coverage data assessment but as the nature and position is not precisely known, no formal exclusion zone is recommended but instead a general awareness of the position is considered appropriate at this phase.	yes	-	This will be secured in the WSI
Construction	Avoid impact to heritage assets	Offshore Development Area	Engineering led geotechnical cores collected post-consent will undergo a staged program of geoarchaeological assessment and analysis. In brief the process is as follows; <ul style="list-style-type: none"> • Stage 1: Geoarchaeological review of core logs; • Stage 2: Geoarchaeological recording; • Stage 3: Geoarchaeological assessment; • Stage 4: Geoarchaeological analysis, and; • Stage 5: Final reporting 	yes	-	This will be secured in the WSI
Construction	Avoid impact to heritage assets	Offshore Development Area	Watching briefs where seabed material is brought to the surface, for example during pre-lay grapnel runs	yes	-	This will be secured through the CEMP and WSI

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Construction	Avoid impact to heritage assets	Offshore Development Area	Watching briefs for any intrusive works carried out in the HDD exit zone (during long HDD)	yes	-	This will be secured through the CEMP and WSI
Construction	Avoid impact to heritage assets	Offshore Development Area	The archaeological assessment will be conducted of any further geophysical and geotechnical data	yes	-	This will be secured in the WSI
Construction	Avoid impact to heritage assets	Offshore Development Area	As stated above, the primary means of preventing impacts to known heritage assets is avoidance. It is also noted that proposed AEZs may be reduced, enlarged, or removed in agreement with HES if further relevant information becomes available. However, unless modified by agreement, it is important that AEZs are retained throughout the project lifetime. Additionally, monitoring of AEZs may be required by the regulator and curator to ensure adherence both during construction and in the future operation and decommissioning of the wind farm	yes	-	This commitment is for the WSI
Construction	Avoid impact to heritage assets	Offshore Development Area	If anomalies cannot be avoided then additional work may be required to further investigate the nature and extent of anomalies, to establish the archaeological interest and to record them prior to removal. The methodology for such works will be set out post-consent in an Outline WSI (Offshore) (Appendix 15.2 of the Offshore EIA Report) and agreed with Historic Environment Scotland prior to works commencing. Any WSI will be undertaken in accordance the Model Clauses for Archaeological Written Schemes of Investigation: Offshore Renewables Projects (The Crown Estate, 2010) and Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (The Crown Estate, 2021).	yes	-	This commitment is for the WSI
Construction	Avoid impact to heritage assets	Offshore Development Area	If any objects of possible archaeological interest are encountered, that they should be reported through a Protocol for Archaeological Discoveries (PAD).	yes		This commitment is for the WSI which will contain the PAD
Chapter 16: Aviation and Radar						
Construction	Avoid collision risk with aircraft	WTGs and OSP	During the tow to site details of the tow route and the times at which the tow will take place will be made available to NATS and the helicopter operators prior to the tow taking place (these will be weather dependent) via Notice to Air Missions (NOTAM).	yes	-	This will be secured in the CEMP
Construction	Avoid collision risk with aircraft	WTGs and OSP	There will notification to airspace users and aviation obstacle lighting during conditions of poor visibility, as deployed by tall cranes. Notification is conducted through the formal NOTAM process.	yes	-	This will be secured in the CEMP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Project design	Avoid interference with search and Rescue Operations	WTGs and OSP	<p>MCA SAR guidelines will be observed when designing the site:</p> <ol style="list-style-type: none"> 1. WTGs are positioned in straight lines with a common orientation across the whole development, creating safe lanes for SAR access; SAR lanes. 2. The initial layout, at least, should be based on two orientations of SAR lanes. 3. Curved or non-linear designs should be avoided. 4. SAR lanes should be at least 500m wide between blade tips, allowing for any surface drift. 5. The wind farm should be fitted with lighting that is controllable from the development control room and which is night vision goggle (NVG) compatible. 6. The control room for the development should be equipped with very high frequency (VHF) (air and maritime) communications with remote antennas in the wind farm to facilitate SAR communications. 7. WTGs should be marked with geographically logical numbering to facilitate navigation within the wind farm. 8. Substations and meteorological masts should be aligned with turbines so as not to impede SAR lanes. 9. Where possible, SAR lanes should be aligned with those of adjacent wind turbine developments or buffer zones created 	yes	-	These guidelines will be observed in designing the site and managed within the ERCoP.
Construction	Avoid collision risk with aircraft	WTGs and OSP	<p>Article 223 of the Air Navigation Order 2016 (last amended 13 April 2022 by the Air Navigation (Amendment) Order 2022) stipulates that offshore WTGs within UK territorial waters, with a height of 60 m or more above the highest astronomical tide (HAT), must be fitted with obstacle lighting, primarily for night-time use. The maximum blade tip height of the WTGs at the Windfarm Site will be between 242 m and 264 m above HAT.</p> <p>The article requires medium intensity (2,000 candela) steady red lighting mounted on the top of each nacelle and requires for some downward spillage of light. The article also allows for the CAA to permit that only turbines on the periphery of any wind farm need to be equipped with aviation warning lighting. If four or more WTGs are located together in the same group, with the permission of the CAA, only those on the periphery of the group need be fitted with a light and such lighting, where achievable shall be spaced at longitudinal intervals not exceeding 900 m. Note that where WTGs are spaced at intervals greater than 900 m this simply equates to adjacent WTGs.</p>	yes	-	This will be secured through the LMP
All phases	Avoid interference with RAF Buchan military air defence radar	WTGs and OSP	The Applicant proposes the use of a NAIZ and an AS area as an interim solution and will continue to engage with the MOD and the Offshore Wind Industry Council (OWIC) to enable the use of new solutions, if possible, on the Green Volt Offshore Windfarm as the enduring solution.	-	yes	This will be secured in the DSLP
All phases	Avoid interference with NATS primary surveillance radars and Aberdeen Airport	WTGs and OSP	Use of a blank combined with a TMZ in the vicinity of the wind farm and an extension of the NATS/Aberdeen wide area multilateration (WAM) system	-	yes	This will be secured in the DSLP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
All phases	Avoid interference with radar systems	WTGs and OSP	Ongoing consultation with OWIC	-	yes	This will be secured in the DSLP
All phases	Avoid interference to Helicopter Main Routes (HMR)	WTGs and OSP	Mitigation of HMR impacts may be achieved through one or a combination of the following: <ul style="list-style-type: none"> • Redesign the HMRs to avoid the wind farm completely; • Redesign the HMRs to include corridors through the wind farm; • Agree tactical routing for use under icing conditions; and / or • Use helicopters approved for specified icing conditions compatible with overflying turbines. Mitigation will be agreed through ongoing consultation with key stakeholders, including helicopter operators	-	yes	This will be secured in the DSLP
Chapter 17: Infrastructure and Other Marine Users						
Project design	Avoidance of existing marine infrastructure	Offshore Development Area	Ongoing consultation, desk-based research and offshore surveys to allow siting of Project infrastructure with minimise interference to existing infrastructure / other activities	yes	-	This was undertaken during the site selection process
Project Design	Avoidance of decommissioned Oil and Gas (O&G) assets	Windfarm Site	The Green Volt array pattern and position applied will deliberately avoid placing turbines and substructures directly above pipelines and umbilicals remaining in-situ, and abandoned well-centres at the seabed. The final offsets applied will be determined by collaboration with the oil and gas operator via a structured risk assessment approach. Positioning of Wind Farm equipment on the seabed such as moorings and inter-array cables will also avoid interaction where possible, however, there is a strong likelihood that crossings will be necessary. Such crossings will be finalised with the input and agreement with the oil and gas operator since they will be legally responsible for the notification process and the ongoing liability associated with the decommissioned equipment affected by the crossing.	yes	-	This will be secured in the DSLP, risk assessments and CaP
Pre-Construction	Avoid interaction with UXO	Offshore Development Area	Pre-construction surveys will be implemented by the Project in order to identify any potential hazards within the Windfarm Site and offshore export cable corridors. These will include geophysical surveys to identify seabed hazards such as discarded fishing gear, wrecks or unidentified objects and magnetometer surveys to identify for the presence of UXO devices. Any identified UXO devices would be avoided through micro-siting or require a subsequent UXO clearance campaign.	yes	-	This will be secured in the CEMP
Construction	Avoid disruption of other users activities and maintain safety	Offshore Development Area	Safety zones for construction, major operation and maintenance and decommissioning will be agreed with MS-LOT and located around any structure where construction work is underwater, partially completed structures where work is not underway and completed structures	yes	-	This will be secured through the NSP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
All phases	Avoid disruption of other users activities and maintain safety	Offshore Development Area	<p>The Project will additionally ensure that there are appropriate communications to inform other marine users of the progression of the works and the notification of significant construction events which have the potential to temporarily restrict areas for safety purposes. These measures are detailed in Chapter 14: Shipping and Navigation and will include:</p> <ul style="list-style-type: none"> • A marine coordination centre to monitor vessels contracted by the Project and other marine vessels. This centre will be monitored 24/7 and enable other marine users to contact personnel associated with the Project about any identified issues. • Notice to Mariners (NtMs) will be issued to provide updates to other marine users of the construction works that are currently being undertaken and any planned in the near future. Any persons can be added to the NtM distribution list as required. • A notification will be produced in the Kingfisher news bulletin or when a significant construction event is planned to occur with the Project. • Any cardinal or marker buoys associated with the Project will be communicated to the necessary stakeholders and informed through NtMs, United Kingdom Hydrographic Office (UKHO) and Northern Lighthouse Board (NLB). The information will include detailed maps and coordinates to enable the continuing navigational safety for other marine users. • Details will be provided to UKHO to facilitate appropriate marking of Project infrastructure on appropriate UKHO Admiralty Charts. 	yes	-	This will be secured through the VMP and NSP
All phases	Avoid disruption of other users activities and maintain safety	Offshore Development Area	<p>As detailed in Chapter 16: Shipping and Navigation, a series of plans will be developed to protect other marine users, including:</p> <ul style="list-style-type: none"> • VMP; • NSP; • MPCP; • DSLP; and • LMP. 	yes	-	This commitment is for the VMP; NSP, MPCP, DSLP, LMP
Construction	Avoid disturbance of other user activities on the seabed	Inter-array cables, Buzzard Export Cable Route, Landfall Export Cable Route	All cables will be installed and maintained in line with standard industry guidance and good practice (e.g. Subsea Cables UK Guidelines, International Cable Protection Committee Recommendations) that provide guidance on proximity of cables to existing assets and coordination with other operators. The Project will comply with all cabling industry standards in locations where the cables are buried.	yes	-	This will be secured through the CaP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Construction	Avoid disturbance of other user activities on the seabed	Inter array cables, Buzzard Export Cable Route, Landfall Export Cable Route	Inter-array, OSP interconnector and offshore export cables will be buried beneath the seabed to a minimum target depth of 0.6 -1.5 m, wherever practicable, in line with DECC, 2011. Cable protection measures will be applied in areas where burial is not possible, e.g. where the cables are required to cross existing cables or in areas where hard seabed are encountered. This will enable a reduction in the potential for interactions between other marine users and the deployed cabling infrastructure associated with the Project. This is particularly important to enable potential fishing activities in the locations where the cabling infrastructure has been buried (see Chapter 13: Commercial Fisheries for further details). Cable protection will be monitored as per cable suppliers' recommendations, and in agreement with power purchase customers.	yes	-	This will be secured through the CaP
All phases	Avoid disturbance of other user activities	Offshore Development Area	Owners and operators of existing or proposed infrastructure and petroleum blocks / licences (including oil and gas companies, other wind farm developers, and electrical and telecommunication cable and pipeline operators) are, and will continue to be, consulted by Green Volt and commercial and technical cable crossing agreements and / or Block Crossing Agreements (BCAs) will be put in place where required.	yes	-	N/A Legal agreements will be reached where required
Construction	Avoid disturbance to existing pipes / cables	Offshore Development Area	Crossing and proximity agreements will be agreed post-consent with the relevant asset owners. It will be the responsibility of the respective Pipeline Operators to inform the NSTA and also the OPRED's Offshore Decommissioning Unit (OPRED-ODU) to see if any updates to existing Pipeline Works Authorisations (PWAs) or decommissioning plans are required. Cable crossings will be perpendicular (or as close as possible to 90°) to minimise the physical interaction and therefore limit the risk of damage to the existing cable	yes	-	This will be secured through the CaP
Construction	Avoid disturbance of other user activities on the seabed	Offshore Development Area	The Project will comply with all cabling industry standards in locations where the cables are buried. Further information on the intended pre-construction campaigns is outlined in Chapter 5 Project Description of this Offshore EIA Report .	yes		This will be secured through the CaP
All phases	to manage risk of turbines breaking free of moorings	Windfarm Site	Appendix 5.1 considers the risk of WTGs breaking free of moorings or any associated issues during tows. In line with MCA's Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA & Health and Safety Executive (HSE), 2017) ongoing Third Party Verification (TPA) will be undertaken for all mooring systems (including modification) In addition, Green Volt OWL will put a continuous Global Positioning System (GPS) in place, which will be continuously monitored, with capability of being tracked via Automatic Identification Systems (AIS) in the event of a loss of WTG. Each WTG will also have an alarm system in place, whereby an alert will be provided to the Marine Coordination Centre in the event that any floating substructure leaves a pre-defined ringfenced alarm zone. This means in the unlikely event that a floating substructure suffers total loss of station and drifts outside of its alarm zone, GreenVolt OWL would be made aware, and would be able to track its position and make the necessary emergency arrangements. The Navigational Risk	yes	-	This will be secured in the DSLP (systems implemented) and NSP (procedures for monitoring and action)

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
			Assessment (Appendix 14.1) concludes therefore this this impact would be broadly acceptable			
Construction	To manage the scenario of an emergency tow	Offshore Development Area	<p>The aim is to design out the scenario where an emergency tow is required by following appropriate design codes and draw on experience gained by the oil and gas industry. The number of mooring lines per floating substructure allows for some failure (in relation to metocean conditions or vessel allision, for example) whilst maintaining integrity of the mooring system. The materials for each mooring line are selected to ensure stability and wear resistance, whilst the attachment points are designed for fatigue.</p> <p>During construction, all aspects of the mooring system and the attachment points will be subject to thorough scrutiny. As the floating substructures are classed as ships, there will be compliance with flag state rules and a class surveyor will be present throughout. TPV of the mooring systems will be undertaken by an independent and competent body to ensure they meet the required standards. Once at the wind farm site, a programme of inspection of the floating substructures and mooring systems will be in place on a pre-determined cycle.</p> <p>Each unit will have a GPS system which sets off an alarm if movement starts goes beyond a pre-set limit, for example from a ship allision. It should be noted that this limit is less than what would be expected from a mooring failure and would trigger a response to check the moorings. The alerts will be provided to the Marine Coordination Centre.</p> <p>The floating substructures will probably have mooring bollards that could take tow lines. However, onboard access would be required to attach tow lines, which may be challenging in adverse weather conditions. In such an event, warning mechanisms will be used to give adequate notification to ensure the safety of other sea users until weather conditions are suitable for a towing connection to be made. The procedures for emergency situations will all be detailed in an ERCoP that will be approved by the MCA and the NLB.</p>	yes	-	This will be secured through the CEMP and ERCoP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
			When the units are under tow to or from the wind farm site there will be emergency tow bridles in place, in addition to the tow lines. The bridles float on the surface with a buoy at the free end, but these are not permanent features as the floating lines can be degraded by Ultra Violet (UV) and marine growth and potentially fail at the critical moment.			
Chapter 18: Climate Change						
Project design	Greenhouse Gas emission savings / less construction activities	Floating substructures / Windfarm Site	The floating substructures for the Project provide several benefits over conventional fixed foundations, including reductions in construction materials, piling operations and use of very large offshore construction vessels.	yes	-	This has been undertaken during project design phase
Chapter 19: Socioeconomics, Tourism and Recreation						
All phases	To support positive socioeconomic impacts	Offshore Development Area	As the Project moves into the procurement phase it will seek to maximise local content, where possible. Supply chain events in Scotland will be held to enable local businesses to engage with the Project. There is also a supply chain contact form available on the Green Volt website to enable local suppliers to contact the Project.	yes	-	This will be detailed within the SCDS
All phases	Avoid disruption of other users activities and maintain safety	Offshore Development Area	Safety zones for construction, major operation and maintenance and decommissioning will be agreed with MS-LOT and located around any structure where consultation work is underwater, partially completed structures where work is not underway and completed structures	yes	-	This will be secured through the VMP and NSP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
All phases	Avoid disruption of other users activities and maintain safety	Offshore Development Area	<p>The Project will additionally ensure that there are appropriate communications to inform other marine users of the progression of the works and the notification of significant construction events which have the potential to temporarily restrict areas for safety purposes. These measures are detailed in Chapter 14: Shipping and Navigation and will include:</p> <ul style="list-style-type: none"> • A marine coordination centre to monitor vessels contracted by the Project and other marine vessels. This centre will be monitored 24/7 and enable other marine users to contact personnel associated with the Project about any identified issues. • NtM will be issued to provide updates to other marine users of the construction works that are currently being undertaken and any planned in the near future. Any persons can be added to the NtM distribution list as required. • A notification will be produced in the Kingfisher news bulletin or when a significant construction event is planned to occur with the Project. • Any cardinal or marker buoys associated with the Project will be communicated to the necessary stakeholders and informed through NtMs, UKHO and NLB. The information will include detailed maps and coordinates to enable the continuing navigational safety for other marine users. • Details will be provided to UKHO to facilitate appropriate marking of Project infrastructure on appropriate UKHO Admiralty Charts. 	yes	-	This will be secured through the VMP and NSP
Appendix 5.1: Major Accidents and Disasters						
Pre-construction	Minimise risk of UXO incident	Offshore development Area	Pre-construction surveys will be implemented by the Project in order to identify any potential hazards within the array site and export cable corridor. These will include geophysical surveys to identify seabed hazards such as discarded fishing gear or unidentified objects and magnetometer surveys to identify for the presence of unexploded ordnance (UXO) devices. Any identified UXO devices would require a subsequent UXO clearance campaign.	yes	-	This will be secured through the CEMP
All phases	Minimise risk of fires	Offshore development Area	The small quantities of lubricants, fuel and cleaning equipment required within the project will be stored in suitable facilities designed to the relevant regulations and policy design guidance. ERCoPs will be developed following discussions with the Maritime Coastguard Agency, including risk assessments and designated evacuation plans for workers on board in unlikely event of fire breaking out.	yes		This will be secured in the ERCoP
All phases	Minimise risk of vessel snagging	Offshore development Area	A CaP will be developed to set out the installation methods, which will set out environmental and navigational issues. The Project will use cabling burial techniques, where possible, for both the inter-array and export cables. This will enable a reduction in the potential for interactions between other marine users and the deployed cabling infrastructure associated with the Project. This is particularly important to enable the continuation of fishing activities in the locations where the cabling infrastructure has been buried. The Project will seek cable crossing agreements with other existing cable operators where a cable crossing is required. The Project will comply with all cabling industry standards in locations where the Project cabling infrastructure will be buried.	yes		This commitment is for the CaP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Project design	Minimises navigation risk	Offshore development Area	Site selection process implemented by the Project avoided significant interactions with existing marine infrastructure in the Offshore Development Area. This has been undertaken through a combination of consultation, desk-based research and offshore surveys. This will reduce the potential of the Project's infrastructure interfering with existing marine infrastructure.	yes		This was undertaken through the site selection phase
All phases	Minimises navigation risk	Offshore development Area	See Chapter 14: Shipping and Navigation for mitigation measures to minimise navigation risk	yes	-	This will be secured through the VMP; NSP, MPCP, DSLP, LMP
All phases	Minimises risk of aviation collision	Offshore Development Area	<ul style="list-style-type: none"> • Mitigation for construction (including towing of turbines and lighting of construction plant); • Compliance with requirements for SAR; • Aviation obstacle lighting; and • HMR mitigations. 	yes	-	This will be secured in the DSLP and CEMP
All phases	Minimises risk of accidental spill of hazardous material	Offshore development Area	The Applicant will commit to undertaking construction works in adherence with all relevant best practice guidance and legislation and will prepare all necessary plans in advance of construction activities. As such, the impact of pollution due to leaks and spills from other vessels or other plant equipment was scoped out of the assessment, as agreed by MS-LOT in the Scoping Opinion, as discussed in Chapter 8: Water and Sediment Quality . Where there is the potential for an accidental spill or leak, the focus will be on control measures that would be employed to reduce accidental releases to the environment. To ensure these are captured and implemented, a separate outline CEMP will be developed prior to construction. The CEMP will include measures for planning for accidental spills, address all potential contaminant releases and include key emergency contact details. A MPCP will set out for approval, the management measures to be implemented during construction, operation and decommissioning to mitigate the risks of accidental spills of hazardous materials. Measures to reduced instances of spills, remedial action and response measures to be used in the event of a spill or collision, and detail measures for refuelling at sea.	yes	-	This will be secured through the CEMP and MPCP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
All phases	Minimise risk of UXO	Offshore Development Area	<ul style="list-style-type: none"> • Avoidance - a strategy of potential UXO (pUXO) detection and avoidance is proposed as the most cost effective and efficient method of reducing UXO risks to ALARP. By surveying for and avoiding direct or indirect contact with any pUXO (the source of the risk) and by moving any intrusive activity away from such prospective hazards (where practicable), such risks are appropriately and effectively reduced • Removal of risk receptors - an alternative option is to remove the receptor element (of the source-pathway-receptor model), by moving certain sensitive and vulnerable receptors (typically the crews of offshore vessels), to a safe distance from the point of the intrusive activity and thus the pUXO hazard, so that it will diminish sufficiently the prospective blast, fragmentation (the former and latter are through air effects) and/or shock wave (a through water effect) consequences, in order to reduce UXO risks to ALARP. • Removal of Threat Sources - Where pUXO cannot be avoided, another alternative option, is to verify pUXO by investigation and where it is confirmed UXO (cUXO), to remove it (effectively removing the source element of the source-pathway-receptor model), either by moving it to a position where it can do no harm (but only when it is safe to do so and wherever permit licencing and consent condition allow such actions), and/or by destroying it or otherwise rendering it safe. • In high and medium risk zones geophysical UXO survey is recommended prior to the commencement operations that are planned within the boundaries of the Study Site, in order to provide the basis for a strategy of pUXO avoidance, or for its identification and removal. • Surface detection for threat spectrum UXO should consist of either Side Scan Sonar, Multi Beam Echo Sounder and/or Work Class Remotely Operated Vehicle camera search (subject to visibility and resolution, especially in areas where shallow water operations are planned), over the area of proposed operations and prior to their commencement. • Sub-surface detection for threat spectrum UXO should also be undertaken ahead of seabed intrusive operations should consist of magnetometer/gradiometer survey over the area of the proposed operations. • Any vessels involved in intrusive works should be equipped with UXO specific ERPs, so that in the event of an unplanned UXO discovery the vessel Master and/or the offshore superintendent/party chief (or similar) are informed in advance about what safety actions must be taken. 	yes		This will be secured through the CEMP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
Operation and maintenance	Minimise risk of WTG breaking free of moorings	Windfarm Site	The Regulatory Expectations also require the provision of continuous monitoring either by GPS or other suitable means, Green Volt Offshore Wind will put such a system in place, with each WTG continuously monitored, and with capability of being tracked via AIS in the event of a loss of station as detailed in MGN 654. Each WTG will also have an alarm system in place, whereby an alert will be provided to the Marine Coordination Centre in the event that any floating substructure leaves a pre-defined ringfenced alarm zone. This means in the unlikely event that a floating substructure suffers total loss of station and drifts outside of its alarm zone, Green Volt Offshore Wind would be made aware, and would be able to track its position and make the necessary emergency arrangements.	yes		This will be secured in the DSLP and NSP
All phases	Minimises risk associated with emergency tows	Windfarm Site	<p>The aim is to design out the scenario where an emergency tow is required by following appropriate design codes and draw on experience gained by the oil and gas industry. The number of mooring lines per floating substructure allows for some failure (in relation to metocean conditions or vessel allision, for example) whilst maintaining integrity of the mooring system. The materials for each mooring line are selected to ensure stability and wear resistance, whilst the attachment points are designed for fatigue.</p> <p>During construction, all aspects of the mooring system and the attachment points will be subject to thorough scrutiny. As the floating substructures are classed as ships, there will be compliance with flag state rules and a class surveyor will be present throughout. Third party verification (TPV) of the mooring systems will be undertaken by an independent and competent body to ensure they meet the required standards. Once at the wind farm site, a programme of inspection of the floating substructures and mooring systems will be in place on a pre-determined cycle.</p> <p>Each unit will have a GPS system which sets off an alarm if movement starts goes beyond a pre-set limit, for example from a ship allision. It should be noted that this limit is less than what would be expected from a mooring failure and would trigger a response to check the moorings. The alerts will be provided to the Marine Coordination Centre.</p> <p>The floating substructures will probably have mooring bollards that could take tow lines. However, onboard access would be required to attach tow lines, which may be challenging in adverse weather conditions. In such an event, warning mechanisms will be used to give adequate notification to ensure the safety of other sea users until weather conditions are suitable for a towing connection to be made. The procedures for emergency situations will all be detailed in an Emergency Response Cooperation Plan (ERCoP) that will be approved by the MCA and the NLB.</p> <p>When the units are under tow to or from the wind farm site there will be emergency tow bridles in place, in addition to the tow lines. The bridles float on the surface with a buoy at the free end, but these are not permanent features as the floating lines can be degraded by UV and marine growth and potentially fail at the critical moment.</p>	yes		This will be secured in the ErCoP

Phase	Reason	Project Area / Infrastructure	Proposed Commitment Measure	Embedded mitigation	Additional Mitigation	How is this commitment secured
All phases	Workplace accidents	Offshore Development Area	Other workplace accidents which could lead to major accidents will be avoided by means of training of personnel and ensuring that all personnel have all required qualifications, that qualifications are maintained, and that regular project specific information (e.g. toolbox talks) is promulgated to staff. All equipment, plant and vessels will be fit for purpose and maintained as required. In addition to training, all necessary requirements for dealing with accidents (first aid equipment, firefighting equipment) would be in place to deal with workplace accidents/incidents.	yes		This is part of the Applicant's legal responsibility to provide a safe working environment

Table 3 Proposed Monitoring

Proposed Monitoring	How is this commitment secured?
Chapter 9: Benthic and Intertidal Ecology	
Biosecurity plans will be in place including adhering to best practice guidelines for activities such as bilge pumping and use of antifouling. Training on MINNS will be provided to contractors conducting operation and maintenance tasks so that common MINNS can be recognised, and steps to take if such species are observed on moorings to prevent further spread. Should MINNS be identified as part of the offshore Project activities, a management and monitoring plan will be developed to measure the impact of any steps taken to prevent further spread and to reduce MINNS presence.	This will be secured through Biosecurity Plans and the PEMP
Chapter 10: Fish and Shellfish Ecology	
The Applicant anticipates that a Joint Industry Project or a collaborative research programme which supports the development of the technique for the far offshore marine environment would be established. Through cross-industry data sharing, this Project, and others, can begin to address the key knowledge gaps around offshore eDNA dynamics, thereby approaching a position where this technique can be usefully deployed far offshore, both as a baseline characterisation and monitoring tool. Depending on the timescales of any collaborative research programme then the Applicant may be able to contribute, directly or indirectly. For example, during the development of the PEMP consideration can be given to whether there are practical opportunities for eDNA samples to be collected if there are appropriate vessels on site.	This will be managed through the PEMP
Chapter 11: Marine Mammals	
The PEMP will include for monitoring for entanglement risk. This will include: <ul style="list-style-type: none"> • Surveys: the WTG and moorings would be regular checked by ROV (approximately 15 times annually for both planned and unplanned maintenance activities); <ul style="list-style-type: none"> o This would ensure that there was no material such as discarded nets, ropes or other debris which could increase the risk of entanglement for marine mammals, or interfere with the optimal operation of the WTGs. Surveys would be carried out according to ABS rules and standards. This technique is currently being used on Kincardine Offshore Windfarm, which has not found any entanglement events to date. • Monitoring for large strains on mooring lines; <ul style="list-style-type: none"> o On Kincardine Offshore Windfarm this has to date been undertaken by load cells attached to the mooring devices and subsea cables, designed to alert if there is unexpected load on the devices which can then be examined. The monitoring method is in the process of changing to using position monitoring system, which will identify the associated drag function on the structures outside the normal operating range. The method used will be agreed with NatureScot and MSS, and take account results of the two methods being used at Kincardine Offshore Windfarm to inform the most appropriate technique at the time of deployment of Green Volt Offshore Windfarm. In the event that any entanglement of a marine mammal does occur through the operation of the Project, additional management and monitoring measures may be required to ensure it does not happen again.	This will be secured through the PEMP

Proposed Monitoring	How is this commitment secured?
Chapter 12: Offshore and Intertidal Ornithology	
Development of and adherence to a PEMP, which will set out commitments to environmental monitoring in pre-, during and post-construction Project phases to monitor and validate the impacts predicted within the ornithology chapter	This will be secured through the PEMP
Chapter 14: Shipping and Navigation	
The Regulatory Expectations also require the provision of continuous monitoring either by Global Positioning System (GPS) or other suitable means. The Applicant will put such a system in place, with each WTG continuously monitored, and with capability of being tracked via AIS in the event of a loss of station as detailed in MGN 654. Each WTG will also have an alarm system in place, whereby an alert will be provided to the Marine Coordination Centre in the event that any floating substructure leaves a pre-defined ringfenced alarm zone. This means in the unlikely event that a floating substructure suffers total loss of station and drifts outside of its alarm zone, the Applicant would be made aware, and would be able to track its position and make the necessary emergency arrangements	This will be secured in the DSLP and NSP
Chapter 15: Marine Archaeology and Cultural Heritage	
Watching briefs ¹ will be undertaken where seabed material is brought to the surface, for example during pre-lay grapnel runs; and for any intrusive works carried out in the HDD exit zone (during long HDD).	This will be secured through the WSI

¹ A watching brief is a formal programme of archaeological monitoring that involves attendance by a suitably qualified and experienced archaeologist during groundworks or other site activities/interventions associated with the scheme in the terrestrial or inter-tidal zone, and/ or marine activities such as during offshore obstruction clearance (where considered appropriate).

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