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Environmental Impact Assessment – Scoping Report MarramWind Offshore Wind Farm

Appendices: 1B, 1C, 3A, 4A, 4B, 6.1A, 6.5A, 6.9A and 7.1A

MarramWind

A joint venture between ScottishPower and Shell UK $\,$





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Term	Abbreviation
μgm	microgram per metre
μm	micrometre
AA	Appropriate Assessment
AADF	Annual Average Daily Traffic Flows
AADT	Annual average daily traffic
ABPmer	ABP Marine Environmental Research
AC	Alternating Current
AEP	Annual Exceedance Probability
AIL	Abnormal Indivisible Loads
AIP	Aeronautical Information Publication
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
amsl	Above mean sea level
AOD	Above Ordnance Datum
AoS	Area of Search
APR	Annual Progress Report
AQAL	Air Quality Assessment Level
AQG	Air Quality Guidelines
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AR5	Fifth Assessment Report
AR6	Sixth Assessment Report
ATC	Air traffic control
AtN	Aids to Navigation
AWI	Ancient Woodland Inventory
BAP	Biodiversity Action Plan

Term	Abbreviation
вст	Bat Conservation Trust
BDMPS	Biologically Defined Minimum Population Scale
BEIS	Business, Energy & Industrial Strategy
BESS	British Energy Security Strategy
BGS	British Geological Survey
BS	British Standard
BSI	British Standards Institution
C6H6	Benzene
CAA	Civil Aviation Authority
CaP	Cable Plan
CAR	Controlled Activity Regulations
CAR 2012	Control of Asbestos Regulations 2012
CBD	Convention on Biological Diversity
CBRA	Cable Burial Risk Assessment
ссс	Climate Change Committee
CCR	Climate Change Resilience
CCRA	Climate Change Risk Assessment
CCTs	Coastal Character Types
CDM	The Construction (Design and Management) (CDM) Regulations 2015
CEA	Cumulative Effects Assessment
CEF	Cumulative Effects Framework
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
СЕН	UK Centre for Ecology and Hydrology
CEMP	Construction Environmental Management Plan
CES	Crown Estate Scotland
CfD	Contract for Difference
CFLO	Company Fisheries Liaison Officer
CH4	Methane
CI	Confidence Interval

Term	Abbreviation
CIEEM	Chartered Institute for Ecology and Environmental Management
CIfA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CLR 11	Environment Agency's 2004 Model Procedures for the Management of Land Contamination
со	Carbon monoxide
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent
COARS	Coastal and Offshore Archaeological Research Service
COLREGS	International Regulations for the Prevention of Collisions at Sea
СОР	Conference of the Parties
COP15	15th Conference of the Parties (to the UN Convention on Biological Diversity)
COP21 / COP26	21st / 26th United Nations Climate Change Conference of the Parties
COs	Conservation Objectives
СРМР	Core Path Management Plan
CRTN	Calculation of Road Traffic Noise
CSO	Combined Sewer Overflow
СТМР	Construction Traffic Management Plan
cv	Confidence Variance
DAS	Digital Aerial Surveys
DC	Directional Current
DCLG	Department of Communities and Local Government
DDV	Drop-down video
DECC	Department of Energy & Climate Change
DEFRA	Department of the Environment, Food and Rural Affairs
DfT	Department for Transport
DGC	Defence Geographic Centre
DHCLG	Department of Housing, Communities and Local Government
DMRB	Design Manual for Roads and Bridges
DPO	Draft Plan Option

Term	Abbreviation
DWPA	Drinking Water Protected Area
EC	European Council
ECC	Export Cable Corridor
EcIA	Ecological Impact Assessment
ECOMMAS	East Coast Marine Mammal Acoustic Study
ECU	Energy Consents Unit
EDRs	Effective Deterrence Ranges
EEA	European Environment Agency
EEA State(s)	European Economic Area Member State(s)
EEC	European Economic Community
EEZ	Exclusive Economic Zone
EFT	Emissions Factor Toolkit
EIA	Environmental Impact Assessment
EIA Report	Environmental Impact Assessment Report
ELC	European Landscape Convention
EMF	Electromagnetic Field
EMODnet	European Marine Observation and Data Network
EMSA	European Maritime Safety Agency
EPA	Environmental Protection Act 1990
EPS	European Protected Species
EPUK	Environmental Protection United Kingdom
EQS	Environmental Quality Standard
ERCOP	Emergency Response and Cooperation Plan
ERP	Emergency Response Plan
ES	Environmental Statement
ESAS	European Seabirds At Sea
ESCA	European Subsea Cables Association
EU	European Union
EUNIS	European Nature Information System

Term	Abbreviation
FeAST	Feature Activity Sensitivity Tool
FEH	Flood Estimation Handbook
FIR	Flight Information Region
FLO	Fisheries Liaison Officer
FLOWW	Fishing Liaison with Offshore Wind and Wet Renewables Group
FMMS	Fisheries Management and Mitigation Strategy
FoV	Field of View
FPSO	Floating production storage and offloading
FRA	Flood Risk Assessment
FSA	Formal Safety Assessment
FTRAG	Forth and Tay Regional Advisory Group
GBRs	General Binding Rules
GCR	Geological Conservation Review
GDL	Gardens and Designed Landscapes
GEART	Guidelines for the Environmental Assessment of Road Traffic
GEN	General Policy
GES	Good Environmental Status
GHG	Greenhouse Gases
GIS	Geographical Information System
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, Third Edition
GNSR	Great North of Scotland Railway
GP	General practitioner
GPP	Guidance for Pollution Prevention
GPVS	Gas Protection Verification Accreditation Scheme
GVA	Gross Value Added
GW	Gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystem
GWMU	Groundwater Management Unit
ha	hectare

Term	Abbreviation
HabMOS	Habitat Map of Scotland
НАТ	Highest Astronomical Tide
HDD	Horizontal Direction Drilling
HDV	Heavy Duty Vehicle
HEPS	Historic Environment Policy Statement
HER	Historic Environment Record
HES	Historic Environment Scotland
HFC	Hydrofluorocarbon
HGV	Heavy Goods Vehicle
НМР	Habitat management plan
НМРА	Historic Marine Protected Area
HMR	Helicopter Main Routes
HMWBs	Heavily Modified Water Bodies
HND	Holistic Network Design
HRA	Habitat Regulations Appraisal
HSE	Health and Safety Executive
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IALA	International Association of Lighthouse Authorities
IAQM	Institute of Air Quality Management
ICCI	In-combination Climate Change Impact
ICE	Inventory of Carbon and Energy
ICES	International Council for the Exploration of the Sea
IEMA	Institute of Environmental Management and Assessment
IMO	International Maritime Organisation
INNS	Invasive Non-Native Species
INTOG	Innovation and Targeted Oil & Gas
ΙΟΑ	Institute Of Acoustics
IPCC	Intergovernmental Panel on Climate Change

Term	Abbreviation
IPR	Iterative Plan Review
IROPI	Imperative Reasons of Overriding Public Interest
ISO	International Organisation for Standardisation
ISQG	Interim Sediment Quality Guideline
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservation Committee
km	kilometres
КРІ	Key performance indicator
kV	kilovolt
LAQM	Local Air Quality Management
LAT	Lowest Astronomical Tide
LCA	Land Capability for Agriculture
LCA	Landscape Character Assessment
LCCA	Land Capability Classification for Agriculture
LCOE	Levelized Cost of Energy
LCRM	Land Contamination Risk Management
LCTs	Land Capability for Agriculture
LCCA	Land Capability Classification for Agriculture
LDEMP	Landscape design and ecology management plan
LDP	Local Development Plan
LDV	Light Duty Vehicle
LMP	Lighting and Marking Plan
LNC	Local Nature Conservation Site
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LPD	Local Plan District
LSE	Likely Significant Effect
LT	Long-term
LV	Light Vehicle

Term	Abbreviation
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
m	metre
МАА	Military Aviation Authority
MAGIC	Multi-Agency Geographic information for the Countryside
MAIB	Marine Accident Investigation Branch
MarESA	Marine Evidence based Sensitivity Assessment
MarLIN	Marine Life Information Network
MARPOL	International Convention for the Prevention of Pollution from Ships
MCA	Maritime Coastguard Agency
MFRAG	Moray Firth Regional Advisory Group
MCA	Maritime Coastguard Agency
MCZ	Marine Conservation Zone
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMMP	Marine Mammal Mitigation Protocol
ММО	Marine Management Organisation
MOD	Ministry of Defence
MPA	Marine Protected Area
МРСР	Marine Pollution Contingency Plan
mph	Miles Per Hour
MPS	Marine Policy Statement
MSFD	Marine Strategy Framework Directive
MS-LOT	Marine Scotland Licensing Operations Team
MSS	Marine Scotland Science
MU	Management Units
MW	Megawatt
N2O	Nitrous oxide

Term	Abbreviation
N/A	Not applicable
NAEI	National Atmospheric Emissions Inventory
NATS	National Air Traffic Services
NBN	National Biodiversity Network
NC MPA	Nature Conservation Marine Protected Area
NCN	National Cycle Network
NE	Natural England
NE7	northeast 7
NELBAP	North East Local Biodiversity Action Plan
NERC	Natural Environment Research Council
NERL	NATS En Route
NESBG	North East Scotland Bat Group
NESBReC	North East Scotland Biodiversity Record Centre
NETS	National Electricity Transmission System
NF3	Nitrogen trifluoride
NGESO	National Grid Electricity System Operator
NGR	National Grid Reference
NLB	Northern Lighthouse Board
NLS	National Library of Scotland
nm	nautical miles
NMP	National Marine Plan
NMPi	National Marine Plan Interactive
NNR	National Nature Reserve
NO2	Nitrogen dioxide
NOx	Oxides of nitrogen
NPF	National Planning Framework
NPF3	National Planning Framework 3
NPF4	National Planning Framework 4 (Scotland)
NPS	National Policy Statements

Term	Abbreviation
NRA	Navigational Risk Assessment
NRMM	Non-road mobile machinery
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
NSL	National Speed Limit
NSP	Navigational Safety Plan
NSR	Noise sensitive receptors
NTEM	National Trip End Model
NVC	National Vegetation Classification
NVQ	National Vocational Qualification
NVZ	Nitrate Vulnerable Zone
O&M	Operation and maintenance
ΟΑ	Option Agreement
OAA	Option Agreement Area
OEUK	Offshore Energy United Kingdom
OFTO	Offshore Electricity Transmission Infrastructure
OMR	Offshore Marine Region
ONS	Office of National Statistics
OnSS	Onshore Substation
oos	Out of Service
OREI	Offshore renewable energy installations
ORJIP	Offshore Renewables Joint Industry Programme
OS	Ordnance Survey
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
OTNR	Offshore Transmission Network Review
OWIC	Offshore Wind Industry Council
PAC	Pre-application consultation
PAD	Protocol for Archaeological Discoveries
PAM	Passive Acoustic Monitoring

Term	Abbreviation
PAN	Planning Advice Note
PAWS	Plantations on ancient woodland sites
Pb	Lead
PCm	Pollution Climate Mapping
PCoD	Population consequences of disturbance
PDER	Project Design Envelope Register
PDS	Project Design Statement
PEL	Probable Effect Level
PEMP	Project Environmental Management Programme
PEXA	Practice and Exercise Areas
PFC	Perfluorocarbons
ΡΙΑ	Personal injury accident
РМ	Particulate matter
PMF	Priority Marine Feature
РМР	Peat management plan
PPE	Personal Protective Equipment
PPV	Peak particle velocity
PRoW	Public Right of Way
PSA	Particle Size Analysis
pSAC	Proposed Special Area of Conservation
pSPA	Proposed Special Protected Area
PTS	Permanent Threshold Shift
PVA	Population Viability Analysis
PVA	Potentially Vulnerable Areas
PWS	Private Water Supply
Radar	Radio Detection and Ranging
RAF	Royal Air Force
RBD	River Basin District
RBMP	River Basin Management Plan

Term	Abbreviation
RCP	Representative Concentration Pathways
REZ	Renewable Energy Zone
RIAA	Report to Inform Appropriate Assessment
RIBA	Royal Institute of British Architects
RICS	Royal Institute of Chartered Surveyors
RLOS	Radar line of sight
RMP	Regional Marine Plan
RNLI	Royal National Lifeboat Institution
ROV	Remotely Operated Vehicle
RSMP	Regional Seabed Monitoring Plan
RSPB	Royal Society for Protection of Birds
RYA	Royal Yachting Association
s.36	Section 36
SA	Sustainability Appraisal
SAC	Special Area of Conservation
SAR	Swept area ratio
SBL	Scottish Biodiversity List
SCANS	Small Cetaceans In European Atlantic Waters And The North Sea
SCI	Sites of Community Importance
sCRM	Stochastic Collision Risk Modelling
SCOS	Special Committee on Seals
SD	Standard deviation
SEA	Strategic Environmental Assessment
SELcum	Cumulative Sound Exposure Level
SEPA	Scottish Environment Protection Agency
SF6	Sulphur hexafluoride
SFRA	Strategic Flood Risk Assessment
Shell	Shell New Energies Holding Limited
SiLC	Specialist in Land Contamination

Term	Abbreviation
SLA	Special Landscape Areas
SLVIA	Seascape Landscape and Visual Impact Assessment
SMA	Seal management areas
SMASS	Scottish Marine Animal Stranding Scheme
SMP	Soil management plan
SSC	Suspended sediment concentrations
SVLIA	Seascape, Landscape and Visual Impact Assessment
SMR	Scottish Marine Region
SNCB	Statutory Nature Conservation Body
SNH	Scottish Natural Heritage
SNPF	Scotland National Planning Framework
SO2	Sulphur dioxide
SOAEL	Significant Observed Adverse Effect Level
SoBRA	Society of Brownfield Risk Assessment
SOLAS	International Regulations for the Safety of Life at Sea
SPA	Special Protection Area
SPL	Sound Pressure Level
SPP	Scottish Planning Policy
SPR	ScottishPower Renewables UK Limited
SPZ	Source Protection Zone
SQP	Suitably Qualified Person
SRN	Strategic Road Network
SSEN	Scottish and Southern Electricity Networks
SSS	Side Scan Sonar
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SuRF-UK	United Kingdom Sustainable Remediation Forum
ТА	Transport Assessment
ТСРА	Town & Country Planning (Scotland) Act 1997

Term	Abbreviation
TCP EIA Regulations	Town & Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017
TEMPro	Trip End Model Presentation Programme
то	Transmission Operator
TRL	Transport and Road Research Laboratory
TSS	Total Suspended Solids
TTS	Temporary Threshold Shift
UK	United Kingdom
UKCP18	UK Climate Projections 2018
UKCRP	UK Climate Resilience Programme
UKFEN	UK Fisheries Economic Network
UKHABS	United Kingdom Habitats
ИКНО	United Kingdom Hydrographic Office
UN	United Nations
UNCLOS	United Nations Law of the Sea
UNECE	United Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
UWN	Underwater noise
UXO	Unexploded ordnance
VMP	Vessel Management Plan
VMS	Vessel Monitoring System
VOC	Volatile Organic Compound
VOR	Valued Ornithological Receptors
WANE Act	Wildlife and Natural Environment (Scotland) Act 2011
WCA	Wildlife & Countryside Act
WDC	Whale and Dolphin Conservation
WeBS	Wetland Bird Survey
WEWS Act	Water Environment and Water Services (Scotland) Act
WFD	Water Framework Directive
WHO	World Health Organisation

Term	Abbreviation
WSI	Written Scheme of Investigation
WTG	Wind Turbine Generator
ZOI	Zone of Influence
ZTV	Zone of Theoretical Visibility

Appendix 1C: Glossary

Appendix 1C Glossary

Term	Description / commentary (if applicable)
Aberdeenshire Council	One of 32 divisions of Scotland, designated as a Council area for the purposes of local government, covering Aberdeenshire.
Abstraction	Removal of water from surface water or groundwater reserves.
Acoustic environment	Sound from all sources as modified by the environment.
Air Quality Management Area	An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives.
Air Quality Objectives	Air Quality Objectives are policy targets generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances, within a specified timescale. The Air Quality Objectives are set out in the UK Government's Air Quality Strategy for the key air pollutants.
Air Quality Standards	Air Quality Standards are the concentrations of pollutants in the atmosphere that can broadly be taken to achieve a certain level of environmental quality. Air Quality Standards are based on an assessment of the effects of each pollutant on human health, including the effects on sensitive sub-groups.
Allision	Contact between a vessel and a stationary object.
Alluvium	Material transported by rivers and deposited along its course.
Ambient sound level	The LAeq, T, of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.
Annex I (of the Habitats Directive)	Part of the Habitats Directive 92/43/EEC that identifies habitat types that require conservation through the designation of Special Areas of Conservation (SACs).
Annex II (of the Habitats Directive)	Part of the Habitats Directive 92/43/EEC that identifies species that require conservation through the designation of SACs.

Term	Description / commentary (if applicable)
Annual Exceedance	In flood risk management, the likelihood of a rainfall total, runoff or flow rate of a certain magnitude being exceeded each year.
Anthropogenic	Man-made.
Appropriate Assessment (AA)	An assessment to determine the implications of a plan or project on relevant national site network sites in view of that site's conservation objectives. An Appropriate Assessment forms part of the Habitats Regulations Appraisal (HRA) and is required when a plan or project (either alone or in-combination with other plans or projects) is likely to have a significant effect on a national site network. Where there are adverse impacts, it also includes an assessment of the potential mitigation for those impacts.
Archaeology	The study of the material remains of the past.
Aspect	An individual environmental topic that is considered within EIA.
Audiogram	A graphical representation of the threshold of hearing of a subject as a function of frequency.
Automatic identification systems (AIS)	A system by which vessels automatically broadcast their identity, key statistics including location, destination, length, speed and current status. Most commercial vessels and European Union fishing vessels over 15m in length are required to carry AIS.
Background sound level	The underlying level of sound over a period, T, and is represented by LA90, T, the level exceeded for 90% of the measurement interval T.
Baseline	Existing conditions as represented by the latest available data, whether from literature or survey and used as a benchmark for making comparisons to assess the impact of a development or project.
Baseline conditions	The environment as it appears (or would appear) immediately prior to the implementation of a project, together with any known or foreseeable future changes that will take place before its completion.
Bathymetry	Topography of sea or estuary bed as measured from a fixed vertical datum.
Beach	A deposit of non-cohesive material (e.g. sand or gravel) situated on the interface between dry land and the sea (or other large expanse of water) and actively 'worked' by present day hydrodynamic processes (i.e. waves, tides and currents) and sometimes by winds.

Term	Description / commentary (if applicable)
Bedforms	Features on the seabed (e.g. sand waves or ripples) resulting from the movement and deposition of sediment.
Beneficial or Adverse Types of Landscape Effect	 In landscape effects may be beneficial, neutral, or adverse. In landscape terms – a beneficial effect would require development to add to the landscape quality and character of an area. Neutral landscape effects would include low or negligible changes that may be considered as part of the 'normal' landscape processes such as maintenance or harvesting activities. An adverse effect may include the loss of landscape elements such as mature trees and hedgerows as part of construction, leading to a reduction in the landscape quality and/or character of an area.
Beneficial or Adverse Types of Visual Effect	 In visual terms – beneficial or adverse effects are less easy to define or quantify and require a subjective consideration of a number of factors affecting the view, which may be beneficial, neutral, or adverse. However, it is not assumed that all change, including significant change is a negative experience. Factors are considered such as the visual composition of the landscape in the view together with the design and composition, which may or may not be reasonably, accommodated within the scale and character of the landscape as perceived from the receptor location.
Benthic ecology	The study of the organisms living in and on the sea floor, the interactions between them and their impacts on the surrounding environment.
Biotope	A region of habitat associated with a particular ecological community.
Bryozoan	A type of simple aquatic invertebrate.
Bund	A barrier, dam or mound used to contain or exclude water (or other liquids). Can refer to a bund made from earthworks material, sand etc. or a metal / concrete structure surrounding, for example, a fuel tank.
Cable armour	A flexible cable protection system that encloses the electrical cable to protect it from external forces and damage, provide thermal insulation and to prevent the prevent the escape of electrical fields.
Carbon	A chemical element with the symbol C and atomic number 6. 'Carbon' is used as short-hand to refer to the six greenhouse gases (GHGs) recognised by the Kyoto Protocol. GHGs are converted to CO2e

Term	Description / commentary (if applicable)
	based on their global warming potential per unit as compared to one unit of CO_2 .
Carbon dioxide equivalent (CO₂e)	Carbon dioxide equivalent (CO_2e) is a term for describing different GHGs in a common unit. For any quantity and type of GHG, CO_2e represents the amount of CO_2 that would have the equivalent global warming impact.
Carbon rich soils	NatureScot defines carbon rich soil as "any soil with a surface organic layer (the O horizon as defined in the Scottish soil classification). In this context, it includes surface layers often referred to as peaty soil and peat soil".
Climate Change	A long-term trend in the variation of the climate resulting from changes in the global atmospheric and ocean temperatures and affecting mean sea level, wave height, period and direction, wind speed and storm occurrence.
Climate Change Act	Legislation enacted in 2008 by the UK Parliament to establish a framework for the reduction of greenhouse gas, which includes a target for the year 2050 emissions, a system of carbon budgeting, establishing the Committee on Climate Change, carbon trading schemes and other provisions.
Climate change impact	An impact from a climate trend that affects the ability of the receptor or asset to maintain its function or purpose.
Climate trend	A change in weather or climate related parameters that has potential to do harm to environmental or community receptors or assets, for example increased winter precipitation.
Coastal Cell	Coastline unit within which sediment movement is self-contained.
Cofferdam	A temporary watertight enclosure that is pumped dry to allow construction work to take place on the seabed or below the waterline.
Collision	Contact between two or more moving vessels.
Consequence (climate change)	Any effect on the receptor or asset as a result of the climate trend having an impact.
Conservation Area	An area of built development having statutory protection under the relevant sections of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997.

Term	Description / commentary (if applicable)
Construction effects	Used to describe both temporary effects that arise during the construction phases as well as permanent existence effects that arise from the physical existence of development (for example new buildings).
Construction Environmental Management Plan	A plan that sets out the standards and procedures to which developers and contractors must adhere when undertaking construction of major projects. This will assist with managing the environmental impacts and will identify the main responsibilities and requirements of developers and contractors.
Contaminated land	The definition of land meeting the statutory definition of 'contaminated land' is given in Part 2A of the Environmental Protection Act 1990.
Contract for Difference (CfD)	A financial and legally binding contract between the electricity producer and the Low Carbon Contracts Company, a Crown corporation that oversees the management of the contract.
Core paths	Core paths are paths, waterways or any other means of crossing land to facilitate, promote and manage the exercise of access rights.
Cumulative Effects	Additional changes caused by the Project in conjunction with other similar developments or as a combined effect of a set of developments, taken together.
Cumulative Effects Assessment (CEA)	Assessment of effects as a result of the incremental changes caused by other past, present and reasonably foreseeable human activities and natural processes together with the Project.
Cumulative impact	Impacts resulting from incremental changes caused by other past, present or reasonably foreseeable actions together with the Project.
Cumulative landscape effects	Effects that 'can impact on either the physical fabric or character of the landscape, or any special values attached to it' (SNH, 2012)
Cumulative visual effects: In combination In succession Sequentially	Effects that can be caused by combined visibility, which 'occurs where the observer is able to see two or more developments from one viewpoint' and/or sequential effects which 'occur when the observer has to move to another viewpoint to see different developments' (SNH 2012) In combination:

Term	Description / commentary (if applicable)
	Where two or more developments are or would be within the observer's arc of vision at the same time without moving his/her head (GLVIA3, 2013 Table 7.1).
	In succession:
	Where the observer has to turn their head to see the various developments – actual and visualised (GLVIA3, 2013 Table 7.1).
	Sequential cumulative effect:
	Occurs where the observer has to move to another viewpoint to see the same or different developments. Sequential effects may be assessed for travel along regularly used routes such as major roads or popular paths (GLVIA3, 2013 Table 7.1).
Decibels (dB)	A unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale.
Decommissioning	The period during which a development and its associated processes are removed from active operation.
Deemed planning permission	Deemed planning permission means a planning permission that is deemed to be granted by a direction under section 57 of the Town and Country Planning (Scotland) Act 1997.
	Section 57(1) of the Act defines this further as follows: "Where the authorisation of a government department is required by virtue of an enactment in respect of development to be carried out by a local authority, or by statutory undertakers who are not a local authority, that department may, on granting that authorisation, direct that planning permission for that development shall be deemed to be granted, subject to such conditions (if any) as may be specified in the direction".
	In addition, Section 57(2) defines that "On granting or varying a consent under section 36 or 37 of the Electricity Act 1989, the Scottish Ministers may give a direction for planning permission to be deemed to be granted, subject to such conditions (if any) as may be specified in the direction".
Degree of change	A combination of the scale extent and duration of an effect also defined as 'magnitude'.
Demersal trawl	A fishing net used by towing the trawl along or close to the seabed.

Term	Description / commentary (if applicable)
Department for Business Energy and Industrial Strategy (BEIS)	The Government department responsible for business; industrial strategy; science; research and innovation; energy and clean growth; and climate change.
Designated Heritage Asset	An element of the historic environment that has value in policy and is designated by statute.
Designated Landscape	Areas of landscape identified as being of importance at international, national or local levels, either defined by statue or identified in development plans or other documents.
Designed In Measures	Measures included in the design of a project that help to reduce the impact of the proposal.
Diffusion Tube	Passive diffusion tube samplers collect nitrogen dioxide and other pollutants by molecular diffusion along an inert tube to an efficient chemical absorbent. After exposure for a known time, the absorbent material is chemically analysed and the concentration calculated.
Digital Aerial Surveys	Digital surveys carried out by aeroplane.
Direct effects	Those effects that result directly from the Project, i.e. effects that are made directly to a receptor. An example would habitat loss as a result of clearance activities during construction.
Discharge	Release of effluent waste into a watercourse or water body.
Drop Down Video (DDV)	A survey method in which imagery of habitat is collected, used predominantly to survey marine environment.
Ebb tide	Period when tide level is falling; often taken to mean the ebb current which occurs during this period.
Echolocation	The location of objects by reflected sound.
Ecological feature	Ecological feature is the term used to refer to biodiversity receptors. This term is taken directly from Ecological Impact Assessment guidance from the Chartered Institute of Ecology and Environmental Management.

Term	Description / commentary (if applicable)
Ecological Impact Assessment (EcIA)	The process through which the potential impacts resulting from a project are identified, quantified and assessed through appropriate ecology surveys.
EIA Regulations	 Terminology used in this Scoping Report to refer to four sets of regulations: The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017; The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017; The Marine Works (Environmental Impact Assessment) Regulations 2007; and The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
Elasmobranchs	Cartilaginous fishes such as sharks, rays, and skates.
Electromagnetic field (EMF)	An electric and magnetic force field that surrounds a moving electrical charge.
Elements	Used in landscape and visual assessment in reference to individual parts that make up the landscape, including (but not limited to) such as, for example, trees, hedges and buildings.
Embedded environmental measures	Equate to 'primary environmental measures' as defined by Institute of Environmental Management and Assessment (2016). They are measures to avoid or reduce environmental effects that are directly incorporated into the preferred masterplan for the Project.
Embedded mitigation	Mitigation measures included in the Project design.
Embodied carbon	This describes the carbon footprint of a material, allowing for the sum of the energy required in resource extraction, and any processing required, as well as the transport and supply logistics to the factory gate (prior to transport to the Project for use), to be accounted for within the overall GHG estimation.
Emission factor	The GHG emissions factors relate a given level of activity, or amount of fuel, energy or materials used, to the mass of GHGs consequently released. It is measured in the amount of GHG emissions (e.g. in gCO_2e , tCO_2e , $ktCO_2e$, $MtCO_2$) relative to the activity unit (e.g. tonnes, km, or kgs).

Term	Description / commentary (if applicable)
Enhancement	A measure that exceeds what is required to mitigate the adverse effects of a project.
Ensonification	To fill an area with sound.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
Environmental Impact Assessment Report (EIA Report)	The outcome of the Environmental Impact Assessment (EIA) process is reported within a document called an EIA Report.
Environmental Measures	Measures that are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible, remedy identified effects).
Environmental Quality Standard (EQS)	A limit on concentrations of a chemical parameter established to protect the environment. Long term EQS are often set as an annual average concentration, short term EQS are set as a maximum allowable concentration or as a percentile value.
Epibenthic	Flora or fauna that live on the seabed.
Epifaunal	Animals living on the seabed.
EUNIS habitat classification	A pan-European system that facilitates the harmonised description and classification of all types of habitats, through the use of criteria for habitat identification.
European Commission (EC)	The European Union's (EU's) politically independent executive division. It is responsible for preparing proposals for new European legislation, and it implements the decisions of the European Parliament and the Council of the EU.
European Protected Species (EPS)	Species of plants and animals (other than birds) protected by law throughout the European Union.
European site	European sites are those that are designated through the Habitats Directive and Birds Directive (via national legislation as appropriate). Within Scotland, additional sites designated through international convention are given the same protection through policy – overall all of these are referred to as European sites. European sites in Scotland are considered to be SPAs, SACs, candidate SACs and Sites of Community Importance (SCI). Potential SPAs (pSPA), possible SACs

Term	Description / commentary (if applicable)
	(pSACs), Ramsar sites (designated under international convention) and proposed Ramsar sites.
EUSeaMap	Broadscale habitat maps produced by EMODnet for Europe.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach and the information required to support the EIA for certain aspects.
Exclusive Economic Zone (EEZ)	An area of coastal water and seabed out to a maximum of 200nm from a country's coastline, to which the country claims exclusive rights for fishing, resource extraction and other economic activities.
Export Cable Corridor (ECC)	The broad linear area through seabed (seaward of Mean High Water Springs (MHWS)) and land (landward of MHWS) connecting the Project array area offshore to the proposed substation onshore, and within which electrical export cables will be located.
Extreme weather event	A weather event that is as rare as or rarer than the 10 th or 90 th percentile of a probability density function estimated from observations for a specific place and time of year. By definition the characteristics of what is called extreme weather may vary from place to place in an absolute sense.
Façade level	A correction factor (addition of 3dB to the free field level when calculated using BS5228) to take into account reflections from a building.
Feature	Ecological feature is the term used to refer to biodiversity/ecological receptors. This term is taken directly from Ecological Impact Assessment guidance from the Chartered Institute of Ecology and Environmental Management.
First sales value	The value obtained for fish or shellfish when it is first sold (e.g. from producer to processor).
Fish larvae	The developmental stage of fish that have hatched from the egg and receive nutrients from the yolk sac until the yolk is completely absorbed.
Fish stock	Any natural population of fish that is an isolated and self-perpetuating group of the same species.

Term	Description / commentary (if applicable)
Fishery	A group of vessel voyages that target the same species or use the same gear.
Fishing ground	An area of water or seabed targeted by fishing activity.
Fleet	A physical group of vessels sharing similar characteristics (e.g. nationality).
Flood Risk Assessment (FRA)	A technical assessment required under the Flood Risk Management Act (Scotland) 2009 for developments proposed within a flood zones, as defined by the Scottish Environment Protection Agency (SEPA).
Flood tide	The period of time when tidal water levels are rising.
Food and Environment Protection Act (FEPA)	Legislation to replace the Dumping at Sea Act 1974 with fresh provision for controlling the deposit of substances and articles in the sea; to make provision for the control of the deposit of substances and articles under the seabed.
Formal Safety Assessment (FSA)	A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity as defined by the International Maritime Organisation (IMO).
Former Firth of Forth Zone	An area of seabed in the Firth of Forth, Scotland identified by the Crown Estate as suitable for the development of offshore wind as assessed through a statutory process of Strategic Environmental Assessment (SEA) within the UK's offshore wind leasing Round 3.
Free field level	Resulting level from a measurement that is undertaken away from the acoustic influence of a reflective façade (i.e. at least 3.5m away from any reflective source, not including the ground).
Frequency in Octave Bands	A range of frequencies where the upper frequency limit is twice that of the lower frequency limit. For example, the 1000 Hertz octave band contains acoustic energy at all frequencies from 707 to 1414 Hertz.
Frequency in One Third Octave Bands	Octave bands that are sub divided into three parts, equal to 23% of the centre frequency. Used when octave analysis does not provide sufficient detail. Divides the audio spectrum into 33 or more equal parts where the cut off frequencies have a ratio of 21/3, which is approximately 1.26. For example, a 1 kHz third octave band filter has a centre frequency of 1000Hz with lower and upper frequencies of 891Hz and 1112Hz, respectively.

Term	Description / commentary (if applicable)
Front	Area separating two distinct water masses with different densities.
Future Baseline	Refers to the situation in future years without the Project.
Gear type	Methods or equipment used for fishing.
Geoarchaeology	A multi-disciplinary approach that uses the techniques and subject matter of geography, geology, geophysics and other earth sciences to examine and inform archaeological knowledge and thought.
Geodiversity	Defines the variety of rocks, minerals, fossils, landforms, sediments and soils, together with the natural processes that form and alter them.
Geographical Information System (GIS)	A system that captures, stores, analyses, manages and presents data linked to location. It links spatial information to a digital database.
Geomorphology	The physical shape and characteristics of the seabed or coastline.
Geophysical survey	Activities to obtain data on the distribution and nature of geophysical properties of the seabed (e.g. bathymetry, surficial sediment type and bedforms, sub surface geology). Geophysical survey outputs typically include multibeam bathymetry, side scan sonar and sub bottom profiler data.
GHG emissions	GHG emissions are determined by the Kyoto Protocol (1997) to include six categories of GHG: carbon dioxide (CO2), methane (CH ₄), nitrous oxide (N ₂ O), F gases (comprised of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs)), sulphur hexafluoride (SF ₆), and nitrogen trifluoride (NF3). To provide consistent reporting of these gases, each is weighted by its global warming potential and converted to a carbon dioxide equivalent (CO ₂ e).
Gigawatt (GW)	A unit of electrical power equivalent to one billion Watts.
Grab sample	A technique used to sample benthic flora and fauna.
Grounded screen	A grounded metal layer over the conductor insulation of an electrical cable to protect the cable from electrical discharge and provide additional mechanical strength.
Habitats Regulation Appraisal (HRA)	The assessment of the impacts of implementing a plan or policy on a European Site, the purpose being to consider the impacts of a project

Term	Description / commentary (if applicable)
	against conservation objectives of the site and to ascertain whether it would adversely affect the integrity of the site.
Habitats Regulations	The Habitats Directive (Directive 92/43/ECC) and the Wild Birds Directive (Directive 2009/147/EC) were transposed into Scottish Law by the Conservation (Natural Habitats &c) Regulations 1994 ('Habitats Regulations') (up to 12 nm); by the Conservation of Offshore Marine Habitats and Species Regulations 2017 ('Offshore Marine Regulations') (beyond 12 nm); the Conservation of Habitats and Species Regulations 2017 (of relevance to consents under Section 36 of the Electricity Act 1989); the Offshore Petroleum Activities (Conservation of Habitats) Regulations 2001; and the Wildlife and Countryside Act 1981. The Habitats Regulations set out the stages of the Habitats Regulations Appraisal (HRA) process required to assess the potential impacts of a proposed project on European Sites (Special Areas of Conservation, Special Protection Areas, candidate SACs and SPAs and Ramsar Sites).
Health and Safety Executive (HSE)	The Health and Safety Executive is Britain's national regulator for workplace health and safety.
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Heritage Asset	An element of the historic environment that has value in policy.
Hertz (Hz)	The unit of measurement for frequency of a sound wave, measured as the number of sound waves oscillating per second.
Historic Environment	The physical evidence of past human activity.
Horizontal Directional Drill (HDD)	An engineering technique for laying cables that avoids open trenches by drilling between two locations beneath the ground's surface.
Hot spell	Defined as periods with maximum temperatures exceeding 30°C for two or more consecutive days.
Humose soil	The Scottish Government define humose soils as: "a relatively rare group of soils in Scotland known as humose soils. These have organic rich layers with between 15 and 35 % organic matter. These are mineral soils but also considered to be carbon rich."
Hydrodynamics	The study of liquids in motion but used in this Scoping Report to describe the motion of sea waves and tides, either alone or in combination.

Term	Description / commentary (if applicable)
ICES statistical rectangles	The International Council for the Exploration of the Sea (ICES) standardises the division of sea areas to enable statistical analyses of data. Each ICES statistical rectangle is '30 min latitude by 1 degree longitude' in size (i.e. approximately 30 x 30 nautical miles). A number of rectangles are amalgamated to create ICES statistical areas.
Impact	The changes resulting from an action.
Impact pathway	A change descriptively assessed by one aspect, used by another aspect to inform a related assessment.
Important Ecological Feature	Ecologically important features that require further consideration within the EIA process.
Impulsive	A sound described as being impulsive will be characterised by a sudden onset rate of sound. In BS 4142:2014 the onset rate of a sound must exceed a slope gradient of 10dB per second on the positive slope for a sound to be characterised as impulsive. A penalty of up to 9dB can be applied to an impulsive sound dependant on impulse prominence.
In-combination Climate Change Impact (ICCI)	Results when a climate change impact increases or decreases the effect of the Project on an environmental receptor. For example, the biodiversity aspect may identify an effect on an environmental receptor (such as severance of semi-natural woodland) arising from the Project. In addition, the climate hazard (e.g. drought) will lead to a climate change impact (e.g. reduced vegetation growth). The ICCI is the exacerbation of the original effect identified by the environmental aspect. Any environmental measure in place to reduce the effect of the severance would therefore need to also consider the future climate conditions.
In-combination effects	Effects resulting from the combined impacts of the Project with other projects / plans on European Conservation Sites. These will be presented separately within HRA-related documentation.
Indirect effects and secondary effects	Those effects that are not caused immediately by the Project but arise as a consequence of it. An example would be where indirect employment is created as suppliers increase their activities and hire new workers to provide the additional goods and services required by the Project.
Infauna	Animals that live in the sediments occurring on the sea floor.
Interim Sediment Quality Guideline	Guideline values for maximum acceptable concentration of a contaminant in natural sediments.

Term	Description / commentary (if applicable)
Intermittent	An intermittent sound will come from a source that has on and off conditions that are readily distinguishable against the residual acoustic environment. In BS 4142:2014, a penalty of 3dB can be applied to a sound where it is determined to be intermittent.
Inter-related effects	Effects resulting from two or more project impacts acting together, to result in a new or changed effect on a single receptor.
Intertidal zone	The area between Mean Low Water Springs (MLWS) and Mean High Water Springs (MHWS).
Inventory Battlefield	A battlefield site having statutory protection under the relevant sections of the Historic Environment (Amendment) Act Scotland 2011.
Inventory Garden and Designed Landscape	An area of designed landscape having statutory protection under the relevant sections of the Historic Environment (Amendment) Act Scotland 2011.
Joint Nature Conservation Committee (JNCC)	The public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.
Key characteristics	Used in landscape and visual assessment in reference to those combinations of elements that are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
LA10, 18h	The LA10, 18h is the A weighted sound pressure level that is exceeded for 10% of an 18-hour measurement.
LA90, T	The A-weighted sound pressure level that is exceeded for 90% of a given time interval, T.
LAeq, 18hr / LAeq, 16hr / LAeq, 8hr / LAeq, 6hr	The LAeq over 18, 16, 8, and 6-hour periods respectively
LAeq, T	The A-weighted equivalent continuous sound level. It is the notional continuous level that, over the defined time period, T, contains the same sound energy as the actual fluctuating sound that occurred over the same time period.
LAFmax,T	The maximum recorded sound level within a given time period, T, measured using a fast time weighting.

Term	Description / commentary (if applicable)
LAN,T	The level of A-weighted noise exceeded for N% of the measurement time T. Note that the time weighting (usually Fast) is sometimes included, denoted by 'F' (e.g. LAFN,T)
Land Capability for Agriculture Classification	The Land Capability for Agricultural (LCA) Classification devised by the Macauley Land Use Institute (now the James Hutton Institute) classifies land based on its potential for growing different types of crops or for grazing use, taking into consideration soils, climate and landscape. The grading system is summarised below, from highest to lowest land capability, with prime agricultural land defined as land in Classes 1, 2 or 3.1:
	Class 1: Land capable of producing a very wide range of crops. (Prime agricultural land).
	Class 2: Land capable of producing a wide range of crops. (Prime agricultural land).
	Class 3.1: Land capable of producing consistently high yields of a narrow range of crops and/ or moderate yields of a wider range. Short grass leys are common. (Prime agricultural land).
	Class 3.2: Land capable of average production though high yields of barley, oats and grass can be obtained. Grass leys are common.
	Class 4.1: Land capable of producing a narrow range of crops, primarily grassland with short arable breaks of forage crops and cereal.
	Class 4.2: Land capable of producing a narrow range of crops, primarily on grassland with short arable breaks of forage crops.
	Class 5.1: Land capable of use as improved grassland. Few problems with pasture establishment and maintenance and potential high yields.
	Class 5.2: Land capable of use as improved grassland. Few problems with pasture establishment but may be difficult to maintain.
	Class 5.3: Land capable of use as improved grassland. Pasture deteriorates quickly.
	Class 6.1: Land capable of use as rough grazings with a high proportion of palatable plants.
	Class 6.2: Land capable of use as rough grazings with moderate quality plants.
	Class 6.3: Land capable of use as rough grazings with low quality plants.
	Class 7: Land of very limited agricultural value.

Term	Description / commentary (if applicable)
	The LCA classification is based primarily on climate, several soil properties, (for example depth and stoniness), wetness, erosion risk and slope.
	There have been two phases of LCA mapping in Scotland the first was at 1:250,000 scale in 1981 and a later 1:50,000 scale phase in 1987.
	Several assumptions underpin the classification. The classification, as defined in Macauley Institute (2006):
	• "is designed to assess the value of land for agriculture
	 is based largely on physical characteristics and the degree to which they limit agricultural flexibility
	• does not group land according to its most profitable use
	 assumes a satisfactory level of management
	 does not include location, farm structure and condition and access to markets and therefore these criteria do not influence grading
	 is based on current knowledge; revisions may be required with new experience or technological innovations."
Land contamination	The term 'land contamination' is used to describe the presence or potential presence of contaminants in or on the land. However, even if contaminants are present, it does not necessarily mean that land meets the statutory definition of contaminated land.
Land cover	The surface cover of the land, usually expressed in terms of vegetation cover or a lack of it. Related to but not the same as land use.
Landfall	The generic term applied to the entire coastal area between the limit of MLWS and the position of the Transition Joint Bay (TJB) located above the limit of MHWS, inclusive of all construction works, including the offshore and onshore export cable corridor, intertidal working area and landfall compound.
Landings	Quantitative description of the amount of fish returned to port for sale, in terms of value or weight.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.
Term	Description / commentary (if applicable)
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Landscape character (including seascape)	A distinct, recognisable and consistent pattern of elements in the seascape / landscape that makes one landscape different from another, rather than better or worse.
Landscape Character Area (LCA)	These are single unique areas which are the discrete geographical areas of a particular landscape type.
Landscape Character Types (LCTs) (including seascape)	Distinct types of seascape / landscape which are relatively homogenous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement patterns, and perceptual and aesthetic attributes (GLVIA3 2013).
Landscape effects (including seascape)	Effects on the seascape / landscape as a resource in its own right. An assessment of seascape / landscape effects deals with the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the seascape / landscape and its distinctive character. (GLVIA3 2013, Para 5.1).
Landscape patterns (including seascape)	Spatial distributions of landscape elements combining to form patterns, which may be distinctive, recognisable and describable e.g. hedgerows and stream patterns.
Landscape qualities (including seascape)	A term used to describe the aesthetic or perceptual and intangible characteristics of the seascape / landscape such as scenic quality, tranquillity, sense of wildness or remoteness. Cultural and artistic references may also be described here.
Landscape quality (condition)	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape receptors (including seascape)	Defined aspects of the seascape / landscape resource that have the potential to be affected by a proposal
Landscape resource	The combination of elements that contribute to seascape / landscape context, character, and value.

Term	Description / commentary (if applicable)
Landscape sensitivity	The sensitivity of the seascape / landscape to a particular development considers the susceptibility of the landscape and its value.
Landscape value	The relative value that is attached to different seascape / landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.
LASmax,T	The maximum recorded sound level within a given time period, T, measured using a slow time weighting.
Level of effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by a development.
Level of effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by the Project.
Levelised Cost of Energy	Measure of the average net present cost of electricity generation for a generating asset over its intended lifetime.
Likely Significant Effects	It is a requirement of Environmental Impact Assessment Regulations to determine the likely significant effects of the Project on the environment which should relate to the level of an effect and the type of effect.
Listed Building	A structure having statutory protection under the relevant sections of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997. Listed buildings are categorised in terms of their importance with A being the highest and C the lowest.
Local Air Quality Management	The Local Air Quality Management (LAQM) process requires Local Authorities to periodically review and assess the current and future quality of air in their areas. A Local Authority must designate an Air Quality Management Area (AQMA) if any of the Air Quality Objectives set out in the regulations are not likely to be met over a relevant time period.
Local Nature Conservation Sites (LNCS)	Local Nature Conservation Sites are non-statutory designations conferred by Aberdeenshire Council and given weight through local planning policy. These sites are selected through an election of criteria (criteria are area dependent) aimed at identifying 'substantive nature conservation value'.
Long-term habitat loss	Substantive change to a habitat such that it loses the integrity of its defining features for a period of time that bears significance to the

Term	Description / commentary (if applicable)
	species supported by the habitat (ie this may vary between habitats depending on the lifecycle of the dependent species in question) and their ability to successfully recolonise.
Macrobenthic	Animals larger than 1.0mm that inhabit the seabed.
Magnitude (of change)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration'. Also known as the 'degree' or 'nature' of change.
Marine Evidence Based Sensitivity Assessment (MarESA)	Sensitivity assessments, undertaken through the Marine Life Information Network (MarLIN), provide sensitivity assessments for a range of EUNIS and Britain and Ireland habitat classification biotopes, UK wide alongside their detail evidence bases.
Marine licence	Licence required for certain activities in the marine environment and granted under either the Marine and Coastal Access Act 2009 or the Marine (Scotland) Act 2010.
Marine Mammal Mitigation Protocol	A programme of measures to minimise the risk of injury (in the form of a permanent change in hearing referred to as a permanent threshold shift, or PTS) in marine mammals.
Marine Policy Statement (MPS)	The framework for preparing Marine Plans and taking decisions affecting the marine environment in the UK.
Marine Protected Area (MPA)	Marine sites at the national level under the Marine (Scotland) Act 2010. In Scotland, MPAs are areas of sea defined so as to protect habitats, wildlife, geology, undersea landforms, historic shipwrecks and to demonstrate sustainable management of the sea.
Marine Protected Area Assessment	A three-step process for determining whether there is a significant risk that a proposed development could hinder the achievement of the conservation objective(s) of an MPA.
Marine Scotland	Civil service directorate for Scotland, which is responsible for the integrated management of Scotland's seas.
Marine Scotland Marine Licencing Operations Team (MS LOT)	The regulator for determining marine licence applications on behalf of the Scottish Ministers in the Scottish inshore region (between 0 and 12 nautical miles) under the Marine (Scotland) Act 2010, and in the Scottish offshore region (between 12 and 200 nautical miles) under the Marine and Coastal Access Act 2009.

Term	Description / commentary (if applicable)
Marine Strategic Framework Directive	The European Union Directive (2008/56/EC) seeking to achieve good environmental status (GES) in Europe's seas.
MarramWind Limited	A 50/50 Joint Venture company between ScottishPower Renewables (SPR) UK Limited and Shell New Energies Holding Limited (Shell). The Joint Venture is formalised by way of a Shareholder Agreement and has been created for the delivery of the MarramWind Offshore Wind Farm.
Mean (average)	The arithmetic average of a set of numbers, e.g. add up the numbers and divide by the number of numbers.
Mean High Water Springs (MHWS)	The average throughout a year of the heights of two successive high waters during those periods of 24 hours (approximately once a fortnight) when the tidal range is greatest.
Mean Low Water Springs (MLWS)	The average throughout a year of the heights of two successive low waters during those periods of 24-hours (approximately once a fortnight) when the tidal range is greatest.
Megawatts (MW)	Unit of electrical power equal to one million Watts.
Metocean	Relating to meteorology and oceanography.
Metre (m)	Unit of lateral measurement equivalent to 100 centimetres.
MGN	Marine Guidance Notes (MGN) released by the Maritime and Coastguard Agency (MCA) for the purposes of providing advice relating to the improvement of the safety of shipping and of life at sea.
Mineral soil	The Scottish Government define mineral soils as follows: "Mineral soils are soils made up of predominantly sand, silt and clay particles with some (<15 %) organic matter."
Modal (average)	The mode is the number in a dataset that is repeated more often than any other number in the same set.
Moraine	Accumulation of glacial debris.
MRSea	Statistical modelling of Bird and Cetacea Distributions in Offshore Renewables Development Areas.

Term	Description / commentary (if applicable)
Multi Agency Geographic information for the Countryside (MAGIC)	An online, map-based library of data sources maintained by the UK government's Department for Environment, Food and Rural Affairs (Defra).
National Atmospheric Emissions Inventory	The NAEI compiles annual estimates of UK emissions to the atmosphere from sources such as road transport, power stations and industrial plants. These emissions are estimated to inform policy, and to help to identify ways of reducing the impact of human activities on the environment and our health. The NAEI is funded by Defra, the Scottish Executive, the Welsh Assembly Government and the Department for the Environment in Northern Ireland.
National Grid Electricity System Operator's Holistic Network Design (NGESO HND)	To provide a coordinated onshore and offshore design for a 2030 network to meet government objectives of connecting 40 gigwatts (GW) of offshore wind in Great Britain by 2030, including 11GW in Scotland as well net zero by 2050 for GB and 2045 for Scotland. The HND aims to provide an economic, efficient, operable, sustainable and coordinated National Electricity Transmission System (NETS) including the onshore and offshore assets required to connect offshore wind and considering internal interconnectors.
National Policy Statement (NPS)	National Policy Statements are statutory documents published in accordance with the Planning Act 2008. They set out the UK government's policy on, and the national need for specific types of nationally significant infrastructure projects.
Natura 2000	A pan-European network of habitats identified and protected for the presence of rare and threatened habitats and/or species as designated by Annex I or Annex II (respectively) of the Habitats Directive.
Natural capital	Defined in the Scottish Government's Land Use Strategy (Scottish Government, 2021c) as "the habitats and resources of the natural world that combine to provide social, economic and environmental benefits to people. This includes the water, air, soil, plants and wildlife on which we depend".
NatureScot	Formerly known as Scottish Natural Heritage, NatureScot is a public body and government advisor responsible for Scotland's natural heritage, in particular for its natural, genetic and scenic diversity.
Nautical mile (nm)	A unit used in measuring distances at sea, equal to 1,852 metres.

Term	Description / commentary (if applicable)
NESBReC	North East Scotland Biological Records Centre (NESBReC) collates, manages and provides biological information for the North East of Scotland.
NMPi	An interactive mapping system prepared for Marine Scotland to support Scotland's National Marine Plan.
Noise	A term used to describe 'unwanted sound' or any sound that is undesired by the recipient.
Notable species	Species with a conservation designation (e.g. listed in a red data book, Birds of Conservation Concern etc.) but that receive no specific legal protection.
Nursery ground	An area that provides suitable habitat for young fish to live and grow.
Offshore	Pertaining to the seaward side of MLWS, and typically in reference to locations some distance from the coast.
Offshore Wind Farm	An offshore wind farm is a group of wind turbine generators in the same location (offshore) in the sea, which are used to produce electricity.
Onshore	Pertaining to the landward side of MHWS.
Option Agreement	An agreement between two parties (the Crown Estate Scotland and the offshore wind farm developer in this case) to facilitate a future possible transaction concerning an asset at an agree price and on an agreed date.
Option Area Agreement (OAA)	Term for the wind farm site upon the seabed at a location specified in the Option Agreement between the Crown Estate Scotland and a developer. It is the agreement that allows the developer the rights to undertake such tests, survey and site investigations that do not entail the temporary or permanent installation of any works or structures on the seabed.
os	OS stands for Ordnance Survey, which is the national mapping agency for Great Britain. It carries out the official surveying of Great Britain and provides the most accurate and up-to-date geographic data for the country, which is relied on by government, business and individuals.

Term	Description / commentary (if applicable)
OSPAR Convention	The Convention for the Protection of the Marine Environment of the North East Atlantic.
Otter trawl	A net with large rectangular boards (otter boards) that are used to keep the mouth of the trawl net open. Otter boards are made of timber or steel and are positioned in such a way that the hydrodynamic forces, acting on them when the net is towed along the seabed, pushes them outwards and prevents the mouth of the net from closing.
Outdoor Recreation Valuation Tool (ORVal)	An online tool for estimating the recreational usage and value of a resource.
Palaeoecology	The study of past environments.
Paleoenvironmental	Pertaining to past environments.
Peat soil	The Scottish Government define peat soil as follows: "When soil has an organic layer at the surface which is more than 50cm deep, it is defined in Scotland as a peat soil (also referred to as an organic soil). Peat soils are often more than 1m deep and can occasionally be more than 10m deep."
Peatland	The Scottish Government defines peatland as follows: "Peatland is defined in a soil context by the presence of a peat soil or peaty soil types. This means that 'peat forming' vegetation is growing and actively forming peat or it has grown and formed peat at some point in the past."
Peatland habitat	The Scottish Government define peatland habitats as follows: "Peatland habitats can be divided into four broad classes (blanket bog, upland raised bog, lowland raised bog, and fen) depending on the types of plants that formed the peat. Priority peatland habitats are sub sets of these broad habitats which have been recognised under the Scottish Biodiversity Framework as being important to protect for their conservation and biodiversity value."
Pelagic	Of or relating to the open sea.
Plan Option	Term used for the seabed areas identified in the Sectoral Marine Plan for offshore wind development in the ScotWind leasing round.

Term	Description / commentary (if applicable)
Planning Permission	Planning permission granted under the Town and Country Planning (Scotland) Act 1997 for all Project infrastructure located landward of the Mean Low Water Spring (MLWS).
Primary measures	These are modifications to the location or design of the development made during the pre-application phase that are an inherent part of the Project and do not require additional action to be taken. These are also referred to as 'design measures'.
Priority Marine Feature (PMF)	Habitats and species that are considered to be marine nature conservation priorities in Scotland.
Probability	The statistical likelihood of something happening.
Probable effect level (PEL)	The lowest concentration of a contaminant (in natural sediment in this case) at which adverse effects are likely.
Project	The Marram Offshore Wind Farm Project that is the subject of this Scoping Report, as described in Chapter 2.
Project Description	Chapter 2 of the Scoping Report that describes key parameters of the MarramWind Project infrastructure, including materials and installation methods. It includes optionality in relation to some design parameters where the design evolution of the Project is ongoing.
Public Rights of Way (PRoW)	For Scotland, public rights of way are paths that link two public places and have been used by the public for a period of at least 20 years without permission or any attempt to stop this use.
Ramsar site	Areas listed by the UK Government under the Convention on Wetlands of International Importance (the Ramsar Convention 1971).
Rarity	The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type. (GLVIA3 2013)
Rating level, LAr, T	The specific sound level, plus any adjustments for the characteristic features of the sound, (such as tonality, impulsivity or intermittency).
RCP8.5	High/worst case emissions scenario. This scenario uses a Representative Concentration Pathway defined by the Intergovernmental Panel on Climate Change's latest 5th Assessment Report. Representative Concentration Pathway 8.5 specifies the concentration of greenhouse gases that would result in 8.5 W/m2 radiative forcing at the top of the atmosphere by 2100, relative to pre- industrial levels. The increase of global mean surface temperature by

Term	Description / commentary (if applicable)
	the end of the 21st century (2081–2100) relative to 1986–2005 is likely to be 2.6°C to 4.8°C under RCP8.5.
Receptor	This term originates as defined in Regulation 5(2) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and include population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape that may be at risk from exposure to pollutants which could potentially arise as a result of the Project. It is equivalent to the term 'factors' defined in 4(3) of the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, where factors may be subject to significant effects of the Project and include population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and the landscape.
Regular Operator	A commercial operator associated with one or more vessels that transit an area on a regular basis.
Remediation	In the context of land contamination, remediation means actions taken to address risks associated with contaminants in the land that may be affecting or have potential to affect site users, the water environment or other receptors. Remediation can be voluntary or required by law. Under Part 2A of the Environmental Protection Act, the term 'remediation' includes assessment of condition, undertaking remedial work and monitoring the condition. In the context of Part 2A, remedial works should remove significant pollutant linkage(s), either by reducing or removing the contamination source, breaking the pathway(s) or removing receptors. It should be undertaken to an extent that there is no significant harm (or significant pollution (or significant possibility of such harm) to human health and no significant pollution (or significant possibility of pollution) to the water environment or other receptors.
Renewable Energy Zone (REZ)	An area of sea outside of the UK territorial sea over which the UK claims exclusive rights for production of energy from water and wind under section 84 of the Energy Act 2004.
Representative Concentration Pathway (RCP)	Future pathways based on emissions and concentrations of greenhouse gases. Each RCP provides only one of many possible scenarios that could lead to specific forcing mechanisms.
Representativeness	Used in landscape and visual assessment to describe whether the landscape contains a particular character and/or features or elements which that are considered particularly important examples.

Term	Description / commentary (if applicable)
Rochdale Approach	The Rochdale Approach is a parameter-based approach to environmental assessment that aims to take account of the need for flexibility in the evolution of detailed design.
Root mean square (rms)	Root Mean Square of a time varying quantity is obtained by squaring the amplitude at each instant, obtaining the average of the squared values over the interval of interest, and then taking the Square Root of this average.
Safety Zone	An area around a structure associated with an Offshore Renewable Energy Installation where entry is prohibited under the Energy Act 2004.
Sand waves	Large scale asymmetric bedforms with heights of up to 1/3 water depth. Sand waves may be used to give an indication of the predominant direction of sediment transport. These features are sometimes known to migrate at speeds of several km/year.
Scallop dredge	A method to catch scallop using steel dredges with a leading bar fitted with a set of spring loaded, downward pointing teeth. Behind this toothed bar (sword), a matt of steel rings is fitted. A heavy net cover is laced to the frame, sides and after end of the mat to form a bag.
Scheduled Monument	A site or structure having statutory protection under the Ancient Monuments and Archaeological Areas Act 1979.
Scoping Boundary	The area within which the Project and electrical infrastructure will be located, including the temporary work areas.
Scoping Opinion	A Scoping Opinion is adopted by the Planning Authority and Scottish Ministers for a proposed project.
Scoping Report	A report that presents the findings of an initial stage in the Environmental Impact Assessment process.
Scottish Environment Protection Agency	A non-departmental public body of the Scottish Government, responsible for environmental regulation. This includes ensuring that the environment and human health are protected, and that Scotland's natural resources and services are used as sustainably as possible and contribute to sustainable economic growth.
Scottish Ministers	The devolved government of Scotland.

Term	Description / commentary (if applicable)
ScottishPower Renewables UK Limited (SPR)	Part of the Iberdrola group and 50% shareholder in the MarramWind Limited Joint Venture company between ScottishPower Renewables (SPR) UK Limited and Shell New Energies Holding Limited (Shell).
Scour	A localised sediment erosion feature caused by local enhancement of flow speed and turbulence due to interaction with an obstacle.
SeaBORD	A tool to estimate the fate of birds displaced by offshore renewable power developments.
Seascape	Landscapes with views of the coast or seas, and coasts and adjacent marine environments with cultural, historical and archaeological links with each other.
Secondary measures	Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent or through inclusion in the EIA Report. These are also referred to as 'additional measures'.
Section 36 Consent	Consent that can be granted under section 36 of the Electricity Act 1989 for the construction or extension, and operation, of an electricity station.
Sediment deposition	Settlement of sediment in suspension back to the seabed, causing a localised accumulation.
Sediment transport	The movement of a mass of sedimentary material (e.g. silts, muds, sands and gravels) by the forces of currents and waves. Potential sediment transport is the full amount of sediment that could be expected to move under a given combination of waves and currents, i.e. not supply limited.
Semi pelagic (or benthopelagic)	Species partially living their life on the seabed (benthic) and partially living their life in the water column above (pelagic).
Sense of Place (genius loci)	The essential character and spirit of an area: 'genius loci' literally means 'spirit of the place'.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value associated to that receptor.
Setting	Setting is the way the surrounding of a historic asset or place contribute to how it is understood, appreciated and experienced.

Term	Description / commentary (if applicable)
Shell New Energies Holding Limited (Shell)	A subsidiary company of the Shell Petroleum Company Limited and 50% shareholder in the MarramWind Limited Joint Venture company between ScottishPower Renewables (SPR) UK Limited and Shell New Energies Holding Limited (Shell).
Significance	A measure of the importance of the environmental effect, defined by criteria specific to the environmental aspect.
Significant effects	It is a requirement of the EIA Regulations 2017 to determine the likely significant effects of the development on the environment, which should relate to the level of an effect and the type of effect. Where possible significant effects should be mitigated.
	The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described.
	Whether or not an effect should be considered significant is not absolute and requires the application of professional judgement.
	Significant – 'noteworthy, of considerable amount or effect or importance, not insignificant or negligible' (The Concise Oxford Dictionary).
	Those levels and types of landscape and visual effect likely to have a major or important / noteworthy or special effect of which a decision maker should take particular note.
Site of Importance for Nature Conservation (SINC)	A designation used by local authorities for area of land of local conservation value.
Site of Special Scientific Interest (SSSI)	Sites notified at the national level under the Nature Conservation (Scotland) Act 2004. They are a series of sites that are designated to protect the best examples of significant natural habitats and populations of species.
Sitelink	An online, map-based library of data sources maintained by NatureScot.
Small cetaceans in European Atlantic Waters and the North Sea (SCANS)	The name of a scientific research endeavour that involved large-scale ship and aerial surveys of the distribution and abundance of cetaceans in European Atlantic waters. The survey was first undertaken in 1994, with similar surveys also conducted in 2005, 2007, 2016 and 2022.
SOLAS	International Convention for the Safety of Life at Sea.

Term	Description / commentary (if applicable)
Sound level meter (SLM)	SLM is the instrument used for acoustic (sound that travels through air) measurements. It is commonly a handheld instrument with a microphone. The diaphragm of the microphone responds to changes in air pressure caused by sound waves.
Sound pressure level (SOL)	Sound pressure level is the RMS value of the Instantaneous Sound Pressures measured over a specified period of time, measured in decibels (dB) to a given reference pressure level.
Spatial scope	The area over which changes to the environment are predicted to occur as a consequence of a project.
Spawning	The release or deposition of eggs and sperm, usually into water, by aquatic animals.
Special Area of Conservation (SAC)	International designation implemented under the Habitats Regulations for the protection of habitats and (non-bird) species. Sites designated to protect habitats and species in Annexes I and II of the Habitats Directive and sufficient habitat to be conserved to maintain favourable conservation status of designated features.
Special Protection Area (SPA)	Sites classified under EU Directive (79/409/EEC) to protect habitats of migratory birds and certain threatened birds under the Birds Directive.
Specific sound level	An equivalent continuous A weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.
Stakeholder	Person or organisation with a specific interest (commercial, professional or personal) in a particular issue.
Study area	Area where potential impacts from the Project could occur, as defined for each aspect.
Subtidal	The region of shallow coastal waters that are below Mean Low Water Springs.
Susceptibility	The ability of a defined landscape or visual receptor to accommodate a proposed development without undue negative consequences.
Suspended sediment concentration	The mass concentration (mass/ volume) of sediment in suspension.
Sustainability	The principle that the environment should be protected in such a condition and to such a degree that ensures new development meets

Term	Description / commentary (if applicable)
	the needs of the present without compromising the ability of future generations to meet their own needs.
Sustainable Drainage Systems (SuDS)	Drainage systems that are considered to be environmentally beneficial, causing minimal or no long-term detrimental damage.
Sustainable remediation	Sustainable remediation is defined by SuRF UK as: "the practice of demonstrating, in terms of environmental, economic and social indicators, that the benefit of undertaking remediation is greater than its impact and that the optimum remediation solution is selected through the use of a balanced decision-making process."
Sustrans	A charitable body dedicated to promoting sustainable transport, especially cycling and walking. Sustrans has developed an extensive, national network of signed and promoted routes.
Temporal Scope	The temporal scope refers to the time periods over which impacts and effects may be experienced by sensitive receptors.
Temporary or permanent effects	Effects may be considered as temporary or permanent within a timeframe of relevance to the aspect or receptor in question.
Temporary Threshold Shift (TTS)	Reversible and temporary hearing loss.
Tertiary measures	Actions that would occur with or without input from the EIA process. These include actions that will be taken to meet legislative requirements, or those considered to be standard practice and used to manage commonly occurring environmental effects. These are also referred to as 'good practice measures'.
The Crown Estate Scotland (CES)	The public corporation of the Scottish government that is responsible for the management of land and property in Scotland, as owned by the monarch " <i>in right of the Crown</i> ".
Tidal excursion ellipse	The path followed by a water particle in one complete tidal cycle.
Time weighting	Time weightings determine how quickly the sound level meter responds to changes in sound pressure level.
	Fast time weighting: the sound level meter samples over a number of discrete 125ms periods, with all parameters calculated from these 125ms measurements. E.g. a 15-minute measurement period is actually 432,000 individual measurements.

Term	Description / commentary (if applicable)
	Slow time weighting: the sound level meter samples over a number of discrete 1 second periods, with all parameters calculated from these 1 second measurements.
Tonal	A sound described as being tonal will be characterised as a sound that contains one or more distinct tones. In BS 4142:2014, a tone can be identified where a frequency band contains more energy and is shown to have a certain level difference over its neighbouring bands. A penalty of up to 6dB can be applied to a tonal sound dependant on tonal prominence.
Total Organic Carbon	The total amount of carbon found within an organic compound.
Transboundary effects	Assessment of changes to the environment caused by the combined effect of past, present and future human activities and natural processes on other European Economic Area Member States.
Transport Scotland	The national transport agency of Scotland, established by the Transport Scotland Act 2005 as an Executive Agency of the Scottish Government.
Type or Nature of effect	Whether an effect is direct or indirect, temporary, long-term or permanent, positive (beneficial), neutral or negative (adverse) or cumulative.
UKCP18	UK Climate Change Projections 2018. UK Climate Projections 2018 is the most up to date assessment of how the climate of the UK may change over the 21st century, recently updated in 2018. UK Climate Projections 2018 uses climate science to provide observations and climate change projections for the UK and globally until 2100.
Unexploded Ordnance (UXO)	Explosive weapons (e.g. bombs, shells, grenades, land mines, naval mines) that did not explode when they were employed or discarded and still pose a risk of detonation, potentially many decades later.
United Kingdom (UK)	The United Kingdom of Great Britain and Northern Ireland, comprising England, Scotland, Wales and Northern Ireland.
United Nations	The United Nations is an international organisation founded in 1945 to maintain global peace and security.
Vessel Monitoring System	A system used in commercial fishing to allow environmental and fisheries regulatory organisations to monitor, minimally, the position, time at a position, and course and speed of fishing vessels.

Term	Description / commentary (if applicable)
Viewpoints	Selected for illustration of the visual effects fall broadly into three groups:
	 Representative Viewpoints: selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example certain points may be chosen to represent the view of users of particular public footpaths and bridleways;
	 Illustrative Viewpoints: chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations. (GLVIA3 2013, Para 6.19)
	• Specific Viewpoints: chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, such as landscapes with statutory landscape designations or viewpoints with particular cultural landscape associations.
Visual amenity	The overall views and surroundings, which provide a visual setting or backdrop to the activities of people living, working, recreating, visiting or travelling through an area.
Visual effect	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visual sensitivity	The sensitivity of visual receptors such as residents, relative to their location and context, to visual change proposed by development.
Visualisation	Computer visualisation, photomontage, or other technique to illustrate the appearance of the development from a known location.
Vulnerability	The propensity or predisposition of a system or receptor to be adversely affected. This encompasses the sensitivity of the system or receptor and its capacity to cope and adapt.
Wireline	A computer-generated line drawing of the DTM (digital terrain model) and the Project from a known location.
Zone of Theoretical Visibility (ZTV)	A map, (usually digitally produced), showing areas of land within which, a development is theoretical visible.

Appendix 3A: Planning Policy Framework

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1. Introduction

- 1.1.1 **Chapter 3: Legislative and Policy Context** provides an overview of the relevant legislative and policy context for the Project to inform the proposed scope of this EIA. This will allow the EIA to provide relevant assessment evidence to help demonstrate how the consenting applications for the Project comply with relevant policy tests and requirements. Building on the framework outlined in **Chapter 3**, this Appendix provides a detailed summary of individual national, marine and local planning policies of relevance to this EIA, which have informed the proposed scope of assessment.
- 1.1.2 This Appendix is structured as follows:
 - Table 1.1 provides a summary of national policies of relevance to the Project;
 - Table 1.2 provides a summary of the marine policies of relevance to the Project; and
 - Table 1.3 provides a summary of local policies of relevance to the Project.

Table 1.1 Relevant Natio	onal policies to the Project
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Plan	Theme and Policy	Summary	Relevant aspect
National Policy Statements (NPS) 2011	The existing suite of UK Energy NPS' dating from 2011 are Autumn 2021. SPR submitted a detailed consultation respor by the Scottish Ministers and Aberdeenshire Council, the UF policy context for the Project and informing the consideration	under review and draft revised NPS' were consulted on in nse. Noting, whilst consenting applications will be determined K NPS' remain relevant in terms of contributing to the energy n through this EIA of some issues relating to reserved matters.	
NPS EN-1 2011	 Energy transitions: Paragraph 2.1.2: Introduction Paragraph 2.2.6: Transition to a low carbon economy Paragraph 3.4.2: The role of renewable electricity generation Paragraph 3.3.15: The urgency of the need for new electricity capacity 	 Paragraph 2.1.2 states that "energy is vital to economic prosperity and social well-being and so it is important to ensure that the UK has secure and affordable energy. Producing the energy the UK requires and getting it to where it is needed necessitates a significant amount of infrastructure, both large and small scale". Paragraph 2.2.6 states the UK needs to reduce its reliance on a high carbon energy mix to reduce greenhouse gas emissions and improve the security, availability and affordability of energy through diversification. Paragraph 3.4.2 states the Government is committed to increasing the amount of renewable energy capacity, much of which is likely to be through onshore and offshore wind. Large scale deployment of renewables is estimated to reduce the UK's carbon emissions by over 750 million tonnes by 2030. Paragraph 3.3.15 states in order to secure energy supplies that enable us to meet our obligations for 2050, there is an urgent need for new (and particularly low carbon) energy projects to be brought forward as soon as possible, and certainly in the next 10 to 15 years, given the crucial role of electricity as the UK decarbonises its energy sector. 	Socio-economics Greenhouse gas emissions
	 Climate change: Paragraph 4.8.5: Climate change adaptation 	Paragraph 4.8.5 states that new energy infrastructure will typically be a long-term investment and will need to remain operational over many decades, in the face of a changing climate. Consequently, applicants must consider the impacts of climate change when planning the location, design, build, operation and, where appropriate, decommissioning of new energy infrastructure.	Climate resilience
NPS EN-3 2011	 Energy transitions: Paragraph 2.4.2: Criteria for "good design" for energy infrastructure 	Paragraph 2.4.2 states proposals for renewable energy infrastructure and should demonstrate good design in respect of landscape and visual amenity, and in the design of the project to mitigate impacts such as noise and effects on ecology.	Project description Terrestrial ecology and ornithology Onshore noise and vibration Underwater noise and vibration Seascape / Landscape and visual
	Climate Change:Paragraph 2.3.4 Climate change	Paragraph 2.3.4 states that offshore and onshore wind farms should consider how the proposal would be resilient to storms.	Climate resilience Infrastructure and Other Marine Users

Plan	Theme and Policy	Summary	Relevant aspect
NPS EN-5 2011	Energy transitions:Paragraph 1.1.1: Background	Paragraph 1.1.1 recognises that electricity generating infrastructure that is required in the UK needs to move to a low carbon economy, and that maintaining security of supply will be heavily dependent on a fit for purpose electricity network.	Project description
National Planning Framework 4 (NPF4) 2023	The Revised Draft NPF4 was approved without modification & Ministers in February 2023.The Approved NPF4 therefore sup also forms part of the statutory Development Plan for the dete	by the Scottish Parliament on 11 th January 2023. It is anticipated persedes NPF3 and SPP (2014). Subject to the commencement permination of planning applications.	d to be formally adopted by the Scottish t of relevant statutory provisions, NPF4
	 Climate Change: Policy 1: Tackling the climate and nature crises Policy 2: Climate mitigation and adaptation 	Policy 1 states simply that " <i>when considering all development proposals significant weight will be given to the global climate and nature crises</i> ". Local Development Plans (LDPs) must also address the global climate emergency and nature crisis by ensuring the spatial strategy will reduce emissions and adapt to current and future risks of climate change by promoting nature recovery and restoration in the area.	AII
		Policy 2 requires development proposals to be sited and designed to " <i>minimise lifecycle greenhouse gas emissions as far as possible</i> " and to adapt to current and future risks from climate change.	Greenhouse Gases
	 Energy transitions: National Spatial Strategy: North East Spatial Planning Priorities: North – Sustainable Places Spatial Planning Priorities: North – Productive Places National Developments: 3. Strategic Renewable Electricity Generation and Transmission Infrastructure Policy 11: Energy 	 The National Spatial Strategy includes specific elements for the North and North East areas, including noting that parts of this coastline will be vulnerable to future climate impacts. It identifies that the North East area of Scotland will play a crucial role in achieving Just Transition to net zero. The National Spatial Strategy sets out relevant aims for the North East Area including the following: Plan infrastructure and investment to support the transition from oil and gas to net zero whilst protecting and enhancing blue and green infrastructure and decarbonising connectivity; and Support continued economic diversification and innovation 	Project description Climate Resilience Water resources and flood risk Land use Socio Economics Greenhouse Gases Shipping and Navigation
		To help implement the National Spatial Strategy, the North Sustainable Places Spatial Planning Priorities section notes that land and sea assets will play an internationally significant role in renewable energy generation and carbon sequestration. It further states that renewable energy development should capitalise on the area's significant natural energy resources, and there is potential to significantly increase offshore wind energy capacity.	Project description Climate Resilience Land use Socio Economics Greenhouse Gases
		The North Productive Places Spatial Planning Priorities section recognises the Northern area of coastline, including that adjacent to the North East area, as providing <i>"significant opportunities for marine energy arising from</i> <i>Scotwind</i> ".	Project description Land use Socio Economics Seascape, landscape and visual
		The Approved NPF4 identifies 18 National Developments as "significant developments of national importance that will	Project description Land use

Theme and Policy

Summary

help to deliver our spatial strategy". This firmly establish the national need for such developments to help implem the national spatial strategy. Annex B of the Approved NPF4 sets out Statements of Need for each National Development and confirms that their "designation means that the principle of the development does not need to be agreed in later consenting processes".

National Development 3 supports strategic scale onshor and offshore renewable electricity generation, repowerin and expansion of the electricity grid. It states that an increase in electricity generation from renewable source will be essential for Scotland to meet its net zero emission targets.

Policy 11 seeks and provides strong support to encourag promote and facilitate all forms of renewable energy development, both onshore and offshore, and associate enabling works including grid infrastructure. "Developme proposals will only benefit from this strong policy support where they maximise net economic impact". Proposals should also apply the mitigation hierarchy to demonstrate through design and mitigation how relevant impacts and issues, as listed in Policy 11, are addressed. Impacts should then be considered in the context of "placing significant weight on the contribution of a proposal to renewable energy and greenhouse gas targets secured". The policy further states that Grid capacity should not constrain renewable energy development.

Cities, regions and built environment:

- Policy 9: Brownfield, Vacant and Derelict Land and **Empty Buildings**
- Policy 10: Coastal Development
- Policy 12: Zero Waste ٠
- Policy 13: Sustainable Transport •
- Policy 14: Design, quality and place •
- Policy 18: Infrastructure First •
- Policy 23: Health and Safety •
- Policy 20: Blue and Green Infrastructure ٠
- ٠ Policy 25: Community Wealth Building
- Policy 26: Business and industry

Policy 9 seeks to encourage, promote and facilitate the reuse of brownfield, vacant and derelict land and empty buildings, and to help reduce the need for greenfield development. It seeks to ensure that the contribution of brownfield land to nature recovery is recognised.

Policy 10 seeks to protect coastal communities and ass and support resilience to the impacts of climate change. Where a design statement is submitted with any plannin application that may impact on the coast it will take into account, as appropriate, long-term coastal vulnerability resilience.

Policy 12 encourages, promotes and facilitates development that is consistent with the waste hierarchy.

Policy 13 seeks to encourage and support development with inclusive active, sustainable travel opportunities an demonstrated that the transport requirements generated have been considered in line with the sustainable travel investment hierarchies.

Policy 14 seeks to encourage, promote and facilitate we designed development that creates successful places by taking a design-led approach and applying the Place

Relevant	aspect
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ies	Socio Economics
nent	Infrastructure and Other Marine Users

re	Project description
ng,	Climate Resilience
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,	Land use Socio-economics Terrestrial ecology and ornithology Landscape and visual
ets ng	Seascape, landscape and visual Climate Resilience Water resources and flood risk
and	
	Land use
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ell Y	Land use

Theme and Policy

Summary

Principle. The Policy defines the six qualities of success places.

Policy 18 encourages, promotes and facilitates an infrastructure first approach to land use planning, which puts infrastructure considerations at the heart of placemaking. The impacts of development proposals on infrastructure should be mitigated, and where infrastruct proposals are in line with that identified as necessary in LDPs they will be supported.

Policy 20 seeks to protect and enhance blue and green infrastructure and their networks. Development proposa that include new or enhanced blue and/or green infrastructure are to provide effective management and maintenance plans covering the funding arrangements f their long-term delivery and upkeep, and the party or parties responsible for these.

Policy 23 seeks to protect health and wellbeing, includir by setting out amenity related criteria to ensure air and noise pollution impacts are addressed and taken into account. The policy also provides relevant criteria to manage risks from hazardous forms of development.

Policy 25 seeks to encourage, promote and facilitate a r strategic approach to economic development that also provides a practical model for building a wellbeing econ at local, regional and national levels. Development proposals linked to community ownership and manager of land will be supported.

Policy 26 seeks to encourage, promote and facilitate business and industry uses in appropriate locations.

Policy 3 seeks to protect biodiversity, reverse biodiversit loss, deliver positive effects from development and strengthen nature networks. "Development proposals for national or major development, or for development that requires an EIA will only be supported where it can be demonstrated that the proposal will conserve, restore an enhance biodiversity". Development proposals are to lead biodiversity in a "demonstrably better state than without intervention through the provision of significant biodivers enhancements and consideration of both nature-based solutions and links with nature networks". The Policy set that future management and monitoring arrangements an included in proposals.

Policy 4 states development proposals that would have unacceptable impact on the natural environment will not supported. The policy implements the protections afford to European Sites through the Habitats Regulations and therefore requires any development proposals likely to h a significant effect on an existing or proposed European site (Special Area of Conservation or Special Protection

Soils and Biodiversity:

- Policy 3: Biodiversity
- Policy 4: Natural Places
- Policy 5: Soils
- Policy 6: Forestry, woodland and trees

	Relevant aspect
sful	
I	Land use Infrastructure and other marine users
n ture	
als for	Land use Traffic and transport Landscape and visual Seascape, landscape and visual Terrestrial ecology and ornithology Benthic, epibenthic, and intertidal ecology
ng	Socio-economics Onshore noise and vibration Air quality Underwater noise and vibration Ground conditions and contamination
new iomy	Land use Socio-economics
nent	
	Land use Socio-economics
ity or	Terrestrial ecology and ornithology Benthic, epibenthic and intertidal ecology Socio-economics
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an t be ded d have า	Land use Terrestrial ecology and ornithology Seascape, landscape and visual Landscape and visual

Theme and Policy

Summary

Areas) to be subject to an Appropriate Assessment. Development proposals that will affect: National Park; National Scenic Area; Site of Special Scientific Interest; National Nature Reserve; Ramsar sites; local nature conservation site or landscape area in the LDP; on spec protected by legislation; or Nature Scot Wild Land Areas will only be supported where they meet specific requirements detailed in Policy 3.

Policy 5 seeks to protect carbon-rich soils, restore peatlands and minimise disturbance to soils from development. "Development proposals on prime agricult land, or land of lesser quality that is culturally or locally important for primary use, as identified by the LDP, or or peatland, carbon rich soils and priority peatland habitat only be supported for the generation of energy from renewable sources". Where development on peatland, carbon-rich soils or priority peatland habitat is proposed, detailed site-specific assessment and a peat management plan will be required.

Policy 6 seeks to protect and expand forests, woodland trees. Development proposals should not be supported where they have any loss, adverse impacts, fragmenting severing of woodland habitats, are identified for protection in the Forestry and Woodland Strategy, or conflict with Restocking Direction, Remedial Notice or Registered No to Comply issued by Scottish Forestry. "Where woodland removed, compensatory planting will most likely be expected to be delivered". Development proposals on si that include an area of existing woodland or land identifi in the Forestry and Woodland Strategy as being suitable woodland creation will only be supported where the enhancement and improvement of woodlands and the planting of new trees on the site (in accordance with the Forestry and Woodland Strategy) are integrated into the design.

Policy 22 seeks to strengthen resilience to flood risk by promoting avoidance as a first principle and reducing the vulnerability of existing and future development to floodi It details that the protection offered by an existing forma flood protection scheme or one under construction can be taken into account when determining flood risk. Where flood risk is managed at site, the Policy provides criteria be met. Development proposals are not to increase the of surface water flooding to others, or itself be at risk, ar manage all rain and surface water through Sustainable Urban Drainage Systems (SUDS).

Policy 7 seeks to protect and enhance historic environm assets and places, and to enable positive change as a catalyst for the regeneration of places. "Development proposals with a potentially significant impact on historic assets or places are to be accompanied by an assessment". Where there is potential for non-designate

Flood risk:

Policy 22: Flood risk and water management

Historic Environment and landscape:
Policy 7: Historic assets and places

Relevant aspect

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and g or on	Land use Terrestrial ecology and ornithology Seascape, landscape and visual Landscape and visual
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e ing. Il be	Water resources and flood risk
to risk nd	
nent	Onshore archaeology and cultural heritage Land use Socio-economics
ed	

Plan	Theme and Policy	Summary		
		archaeological remains to exist, "developers are to provide an evaluation of the archaeological resource at an early stage".		
National Planning Framework 3 (NPF3) 2014	As noted above, NPF3 was recently (on 11 th January 2023) superseded by the Approved NPF4. Noting that NPF3 is now forward, below are those provisions that retain some relevance.			
	 Cities, regions and built environment: Paragraph 2.6- 2.11: Scotland tomorrow Paragraph 2.14: Cities will be a focus for investment Paragraph 2.23: A flexible strategy for diverse places- distinctive city regions Paragraph 2.31: Coastal and island communities will benefit from new investment. Paragraph 3.32: Coastal and island communities will attract innovation and investment Paragraph 3.34: Coastal and island communities will attract innovation and investment Paragraph 3.41: A flexible strategy for diverse places – areas of coordinated action Paragraph 5.11 	 Paragraphs 2.6-2.11 discusses the strategy's aims to ensure all part of Scotland make best use of their assets to build a sustainable future. This includes ensuring developments facilitate adaptation to climate change, reduces resource consumption and lower greenhouse gas emissions. Paragraphs 2.12-2.22 focuses on cities to capitalise on ne and growing economic sectors, identified in the National Renewables Infrastructure Plan. Paragraph 2.23 notes that Scotland's city regions can be developed to be successful and sustainable places. 		

Aberdeen and the northeast is described as the 'energy capital of Europe'. The City Investment Plan sets an ambition to "maintain Aberdeen's position as one of the world's key energy capitals and to maximise its growth potential and diversification into other sectors". There are particular opportunities in the 'Energetica' corridor from Aberdeen towards Peterhead, where a key hub for ener infrastructure and related development is envisaged.

Paragraph 2.31 states that working together with the National Planning Framework, Scotland's first National Marine Plan will provide the strategic policy framework encourage sustainable development and use of the ma environment to deliver economic and social benefit for coastal communities.

Paragraph 3.32 states many of the economic opportuni arising from the transition to a low economy are emergi in coastal areas - including the deployment of offshore renewable energy.

Paragraph 3.41 states the low carbon agenda forms a crucial part of our strategy. Peterhead is a focus for a number of important projects for carbon capture and storage, North Sea interconnectors and offshore renew energy. These can support wider aspirations of growth, including the Energetica corridor.

Paragraph 5.11 identifies the need for further improvem to ensure that the best value from transport infrastructu seen.

Relevant aspect

of very limited relevance to the EIA going

ts to	Project description Traffic and transport Climate resilience
gas	Greenhouse gases
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Plan	Theme and Policy	Summary	Relevant aspect
	 Climate Change: Paragraph 3.8: A low carbon place Paragraph 4.31: The coast and islands will capitalise on their world-class environment 	Paragraph 3.8 sets out Scotland's targets for energy demand to come from renewables. Scottish Ministers had aimed by 2020 to reduce the final energy demand by 20%, improved energy efficiency and identified the further diversification of supplies that would be required	Climate resilience
		Paragraph 4.31 states the climate change impacts on Scotland's coastline, there will be a need to address the long-term resilience of some coastal communities.	
	 Energy transitions: Paragraph 3.9 – 3.13: A low carbon place 	Paragraphs 3.9 – 3.15 sets out the Government's ambitions to lower carbon emissions, continue to make use of Scotland's wind resource and for Scotland to be a world leader in offshore renewable energy. The section identifies the need for both terrestrial and marine planning to play a key role in meeting those ambitious targets.	All
	 Agriculture and biodiversity: Paragraph 4.9 Land use strategy Paragraph 4.10-4.12: A natural, resilient place Paragraph 4.16: A natural, resilient place Paragraph 4.23: A natural, resilient place 	Paragraph 4.9 sets out key principles for the use and management of Scotland's land, emphasising that land use should deliver multiple benefits and encourages the best use of assets to support food production, flood management and carbon storage.	Land use Terrestrial ecology and ornithology Seascape / Landscape and visual
		Paragraph 4.10 references the 2020 Challenge for Scotland's Biodiversity aims to promote and enhance Scotland's nature, and to better connect people with the natural world. The national spatial strategy identifies where development needs to be balance with a strategic approach to environmental enhancement.	
		Urban infrastructure will need to change to adapt to the impacts of climate change, and coastal cities are mentioned as having potential for land use change to be needed to achieve more sustainable and resilient patterns of development in the long-term, in particular, with regard to water management and flooding issues.	
		Paragraph 4.23 states the aim to increase the rate of woodland creation to deliver 100,000 hectares of new woodland over the next 10 years, and made a pledge to plant 100 million trees by 2015. Future reviews will assess what further woodland expansion is required in the 2020s.	
	Flood risk: • Paragraph 4.25: A natural, resilient place	Paragraph 4.25 states catchment-scale flood risk management will become more important in response to changing weather platform and that changing water supplies and water quality issues, coastal erosion and increased vulnerability of the historic building stock will also need to be factored into planning decisions over the longer term.	Water resources and flood risk. Marine water and sediment quality

3A.9

Plan	Theme and Policy	Summary	Relevant aspect
	Shipping:Paragraph 5.27: A connected place	Paragraph 5.27 states that whilst Scotland's maritime freight-handling capacity services both the Atlantic and North Sea routes, most movement comes from the North Sea. The right infrastructure must be in place to support these key international connections.	Shipping and navigation
Scottish Planning Policy (SPP) 2014 Expected to shortly be superseded by National Planning Framework 4 (NPF4) once approved by the Scottish Parliament and adopted by the Scottish Ministers.	 Climate Change: Paragraph 28 -29: Sustainability Paragraph 154: Policy Principles Paragraph 167-168: Other Renewable Electricity Generating Technologies and Storage 	Paragraphs 28-29 supports economically, environmentally and socially sustainable places by enabling development that balances the costs and benefits over the long-term Paragraph 154 sets out that the planning system should support the transformational change to a low carbon economy, consistent with the targets such as 30% of overall energy demand from renewable sources by 2020. The planning system should also support development of a diverse range of electricity generation from renewable energy technologies and guide development to appropriate locations and advise on any issues that will be considered. Paragraphs 167-168 looks at how development plans should identify areas that can accommodate renewable electricity. It also mentions that development plans should identify areas that are weakly connected or unconnected to the national grid and how to facilitate development to prevent this.	Land use Climate resilience
	 Cities, regions and built environment: Paragraph 89 -90: Promoting Rural Development Paragraph 169: Development Management Paragraph 171: Development Management Paragraph 225: Development Planning Paragraph 230: Development management 	 Paragraph 169 discusses how proposals for energy infrastructure development should take account of spatial frameworks for wind farms and heat maps where relevant. Considerations will vary relative to the scale but are likely to include: net economic impacts; scale of contribution to renewable energy generation; effect on greenhouse gas emissions; cumulative impacts; impacts on communities and individual dwellings; landscape and visual; natural heritage; carbon rich soils impacts; impacts on noad traffic; and effects on hydrology, the water environment and flood risk. Paragraph 225 looks at how local development plans should seek to enhance existing, and to promote new, green infrastructure. This should be done through a designled approach. This approach should result in a proposal that is appropriate to place, including green infrastructure assets. 	AI

Theme and Policy

Summary

Historic environment and landscape:

- Paragraph 135: Priority Principles
- Paragraph 141-142: Listed buildings
- Paragraph 143-144: Conservation areas
- Paragraph 145: Scheduled Monuments
- Paragraph 146: Historic Marine Protected Areas
- Paragraph 147: World Heritage Sites
- Paragraph 150-151: Archaeology and other Historic Environment Assets

Paragraph 135 looks at how planning has an important to play in maintaining and enhancing the distinctive and high-quality historic places that are important to the tour industry

Paragraphs 141-142 states that any developments that may affect a listed building should be appropriate to the character of the building and setting. It also mentions th enabling development may be acceptable where it can be shown to be the only way of preventing the loss of the a and assuring its future.

Paragraphs 143-144 state that proposals that are either inside or outside a conservation area should look to preserve or enhance the character of the conservation area. It also mentions that any proposed work to trees i conservation area require prior notice to be given to the planning authority.

Paragraph 145 states that where a proposed developmed may impact a scheduled monument or its setting, it will be given permission where there is exceptional circumstance. If direct impact will happen, written consector to Scottish Ministers will be required.

Paragraph 146 looks at where planning extends to offsh areas, and states that the development must not hinder preservation objectives of Historic Marine Protected Are

Paragraph 147 states that where a development may at a World Heritage Site then the planning authority must protect the Outstanding Universal Value

Paragraphs 150-151 look at how planning authorities should look at protecting archaeological sites and monuments. If any discoveries are made then they must reported to the planning authority. Also, there is a range non-designated historic assets and areas of historical interest, which do not have statutory protection. These resources are important to Scotland's heritage and plan authorities should protect and preserve significant resources.

Agriculture and biodiversity:

- Paragraph 195: Delivery
- Paragraph 199: Development Plans
- Paragraph 202-203: Development Management
- Paragraph 214: Protected Species
- Paragraph 216: Woodland

Paragraph 195 looks at how planning authorities have a duty under the Nature Conservation (Scotland) Act 2004 make sure they further the conservation of biodiversity. must be reflected in development plans.

Paragraph 199 talks about how plans should make sure they address the potential effects of development on the natural environment. They must consider the natural and cultural components together and promote opportunities for enhancement.

	Relevant aspect
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a 4 to This e e nd	Benthic, epibenthic and intertidal ecology Marine mammals Offshore and intertidal ornithology Fish and shellfish ecology Terrestrial ecology and ornithology Seascape / Landscape and visual

Theme and Policy

Summary

Paragraph 202-203 looks at how the siting and design of proposed development should take account of the local landscape character. It also mentions that planning permission will be refused if the nature or scale of the project has an unacceptable impact on the natural environment.

Paragraph 214 identifies that the presence of legally protected species is important in the consideration of planning decisions. If there is evidence to suggest that a protected species is present on site. Protection should b factored into the planning and design of the development

Paragraph 216 looks at woodlands and how they should protected from impacts from development.

Paragraph 255 talks about how the planning system sh promote a precautionary approach to flood risk, flood avoidance, flood reduction and reduction in increase of surface water flooding.

Paragraph 259 looks at how developers should take account of flood risk and the ability of future occupiers to insure development before committing themselves to the site or project. Applicants have the responsibility to safeguard their property.

Paragraph 260 looks at how plans should use strategic flood risk assessment to inform their choices about the location of the development and policies for flood risk. T should have regard to flood maps and take account of Flood Risk management strategies.

Paragraph 259: DeliveryParagraph 260: Development Planning

• Paragraph 255: Policy Principles

Flood Risk:

	Relevant aspect
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Table 1.2	Relevant marine	planning	policies to	the Pro	ject
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Plan	Policy	Summary
UK Marine Policy Statement 2011	Economic growth: • Achieving a sustainable marine economy	 Requirements for: (1) infrastructure to be in place to support and promote safe, profitable and efficient marine businesses; (2) the marine environment and its resources are used to maximise sustainable activity, prosperity and opportunities for all, now and in the future; (3) marine businesses are to take long-term strategic decisions and manage risks effectively; and (4) marine businesses act in a way which respects environmental limits and is socially responsible.
	Climate change: • Ensuring a strong, healthy and just society	 Requirements for: (A) the use of the marine environment benefits society as a whole, contributing to resilient and cohesive communities that can adapt to coastal erosion and flood risk, as well as contributing to physical and mental wellbeing; (B) the coast, seas, oceans and their resources are safe to use; (C) the marine environment to play an important role in mitigating climate change; (D) equitable access for those who want to use and enjoy the coast, seas and their wide range of resources and assets and recognition; and (E) the use of the marine environment will recognise, and integrated with, defence priorities, including the strengthening of international peace and stability and the defence of the UK and its interests.
	Agriculture and biodiversity: • Living within environmental limits	Requirements for: Part 1 biodiversity to be protected, conserved and where appropriate recovered and loss halted; Part 2 healthy marine and coastal habitats can occur across their natural range and are able to support strong, biodiverse biological communities and the functioning of healthy, resilient and adaptable marine ecosystems; and Part 3 the oceans to have viable populations of representative, rare, vulnerable and valued species.
	Historic environment and landscape:Promoting good governance	 Requirements for: marine businesses to be subject to clear, timely, proportionate and, where appropriate, plan-led regulation; and the use of the marine environment is spatially planned where appropriate and based on an ecosystems approach that takes account of climate change and recognises the protection and management needs of marine cultural heritage according to its significance.
Scottish National Marine Plan 2015	The Scottish Government's Programme for G Marine Plan 2. This is expected to play a key relevant policies from the Scottish National Ma	overnment 2022-2023 (September 2022) confirmed plans to develop a replacement National role in the consenting of ScotWind offshore wind projects over the coming years. The following arine Plan 2015 are listed below.
	 Economic growth: GEN 1 General planning principle GEN2 Economic benefit GEN 3 Social benefit GEN 4 Co-existence GEN 21 Cumulative impacts GEN 17 Fairness GEN 18 Engagement 	Sustainable developments that provide economic benefit to Scottish communities and social benefits will be favoured Proposals should enable coexistence with other development sectors and activities, and require for cumulative impacts affect the ecosystem to be addressed. Requirement for all marine interest to be treated with fairness and in a transparent manner when decisions are being made in the marine environment. Early and effective engagement should be undertaken with the general public and all interested stakeholders.

Commercial fisheries Shipping and navigation Infrastructure and other marine users Telecommunications Civil and military aviation Socio-economics

Marine geology, oceanography and physical processes Marine water and sediment quality Infrastructure and other marine users Climate Resilience Socio-economics Civil and military aviation

Benthic, epibenthic and intertidal ecology Marine mammals Offshore and intertidal ornithology Fish and shellfish ecology

Legislative and Policy Context Marine archaeology and cultural heritage Climate resilience Seascape / Landscape and visual

Socio-economics Benthic, epibenthic, and intertidal ecology Fish and shellfish ecology Terrestrial ecology and ornithology

Plan	Policy	Summary
	Climate change: • GEN 5 Climate change	Requirement to act in the way best calculated to mitigate and adapt to climate change.
	 Historic environment and landscape: GEN 6 Historic Environment GEN 7 Landscape / seascape CABLES 1 	Requirement for development and use of the marine environment to protect, and, where appropriate, enhance heritage assets in a manner proportionate to their significance. Developments should take account of seascape, landscape and visual impacts.
		Requirement for cable and network owners to engage with decision makers and provide evidence that the development minimise impacts on the marine historical environment and assets.
	 Physical environment: GEN 8 Coastal process and flooding GEN 12 Water quality and resources GEN 13 Noise GEN 14 Air quality 	Requirement for developments and activities to be resilient to coast change and flooding, and not have unacceptable adverse impact on coastal processes or contribute to coastal flooding. Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Direct or other related Directives apply. Requirement for development should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects. Requirement for development to not result in the deterioration of air quality and should not breach any statutory air quality limits.
	Agriculture and biodiversity: • GEN 9 Natural heritage • GEN 10 Invasive non-native species • WILD FISH 1 • REC & TOURISM 6 • CABLES 1 • REC & TOURISM 5	Requirement for development to comply with legal requirements for protected areas and protected species; not result in significant impact on the national status of Priority Marine Features; and protect (where appropriate) enhance the health of the marine area. Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made. Codes of practice for INNS should be complied with. Requirements to assess impact of development on diadromous fish species and where evidence of impacts on salmon and other diadromous species is inconclusive, it states that mitigation should be adopted where possible and information on the impact on diadromous species from monitoring should be used. Requirement for cable and network owners to provide evidence that the development and activity minimise impacts, where possible, on the environment and appropriate and proportionate environmental consideration and risk assessments should be provided, which may include cable protection measures and mitigation plans. Requirement to support enhancement to the aesthetic qualities, coastal character and wildlife experience.
	Commercial fisheries: • FISHERIES 1 • FISHERIES 2 • FISHERIES 3	 Requirements to take account of the EU's Common Fisheries Policy, Habitats Directive, Birds Directive and MSFD. Developments and activities should take account of the potential impacts on: Article I. fish and shellfish stocks and resultant fishing opportunities; Article II. fishing grounds, commercially fished grounds; and Article III. displacement of fish stocks, the socio-economic costs to fishers and their communities and other marine users.

Climate resilience Greenhouse gases

Project description Marine archaeology and cultural heritage Seascape, landscape and visual Landscape and visual

- Marine geology, oceanography and physical processes
- Water resources and flood risk
- Marine water and sediment quality
- Underwater noise
- Fish and shellfish ecology
- Marine mammals
- Air quality
- Project description
- Marine geology, oceanography and
- physical processes
- Marine water and sediment quality
- Electromagnetic Fields (EMF)
- Benthic, epibenthic and intertidal ecology
- Marine mammals
- Offshore and intertidal ornithology
- Fish and shellfish ecology
- Commercial fisheries
- Shipping and navigation
- Marine archaeology and cultural heritage
- Infrastructure and other marine users
- Socio-economics
- Seascape / Landscape and visual

Fish and shellfish ecology

- Commercial fisheries
- Infrastructure and other marine users
- Socio-economics

Plan	Policy	Summary
	Energy transitions: • RENWABLES 4 • RENEWABLES 5 • RENEWABLES 6 • RENWABLES 7 • RENEWABLES 8	Requirement for applications for marine licences and consents relating to offshore wind and marine renewable energy should be made in accordance with the Marine Scotland Guidance. Compliance with EIA and HRA requirements for the development. Requirement for decision makers to ensure infrastructure is fit for purpose now and in future. Consideration should be given to the potential for climate change impacts on coast vulnerable to erosion.
Shipping: • • • • •	Shipping: • TRANSPORT 1 • TRANSPORT 2 • TRANSPORT 4 • TRANSPORT 6	Requirement for navigational safety in relevant areas used by shipping now and in the future will be protected, adhering to the rights of innocent passage and freedom of navigation contained in UN Convention on the Law of the Sea. Requirement for marine development not to be permitted where it will restrict access to, or future expansion of, major commercial ports or existing or proposed ports and harbours, for example
		Peternead. Requires maintenance, repair and sustainable development of port and harbour facilities in support of other sectors should be supported. Displacement of shipping to be avoided and where possible mitigate to avoid increased journey lengths.
	Cities, regions and built environment: • CABLES 2 • CABLES 4	 Requirement for the following to be taken into account when reaching decision regarding cable development: cables should be suitably routed to provide sufficient requirements for installation and cable protection; new cables should implement methods to minimise impacts on the environment, seabed and other users; cables should be buried to maximise protection where there are safety or seabed stability risks and to reduce conflict with other marine users and to protect the assets and infrastructure; where burial is demonstrated not to be feasible, cables may be suitably protected; consideration of the need to reinstate the seabed, undertake post-lay surveys and monitoring and carry out remedial action where required. When selecting locations for landfall of power and telecommunications equipment and cabling, developers and decision makers should consider the policies pertaining to flooding and coastal protection.
	Safety: • DEFENCE 1 • DEFENCE 3	Requirement to maintain operational effectiveness in Scottish waters used by the armed services, development and use will be managed in these areas: firing danger areas; and communications. Code of conduct for managing fishing and military activities in the documents 'Fishing Vessels Operating in Submarine Exercise Areas' and 'Fishing Vessel Avoidance: The UK Code of Practice Fishing Vessel Avoidance' will be adhered to.
Sectoral Marine Plan for Offshore Wind 2020	Vision	 This plan seeks to contribute to the achievement of Scottish and UK energy and climate change policy objectives and targets, through provision of a spatial strategy to inform the seabed leasing process for commercial offshore wind energy in Scottish waters, which: minimises the potential adverse effect on other marine users, economic sectors and the environment resulting from further commercial-scale offshore wind development; and maximises opportunities for economic development, investment and employment in Scotland, by identifying new opportunities for commercial scale offshore wind development, including deeper water wind technologies.

Project description EIA Process

- Project description
- Marine water and sediment quality
- Fish and shellfish ecology
- Marine mammals
- Offshore and intertidal ornithology
- Shipping and navigation
- Infrastructure and other marine users
- Socio-economics

Project description

- Marine geology, oceanography and
- physical processes
- Marine water and sediment quality
- Electromagnetic Fields (EMF)
- Benthic, epibenthic and intertidal ecology
- Marine mammals
- Offshore and intertidal ornithology
- Fish and shellfish ecology
- Commercial fisheries
- Shipping and navigation
- Marine archaeology and cultural heritage
- Infrastructure and other marine users

Commercial fisheries

- Telecommunications and interference
- Civil and military aviation

Marine geology, oceanography and

- physical processes
- Marine water and sediment quality
- Electromagnetic Fields (EMF)
- Benthic, epibenthic and intertidal ecology
- Marine mammals
- Offshore and intertidal ornithology
- Fish and shellfish ecology
- Commercial fisheries

Plan	Policy	Summary
		The Sectoral Marine Plan was published in line with the Offshore Wind Policy Statement 2020.
	NE7 Plan Option	 In relation to Plan Option NE7, the sectoral plan notes that: The Plan Option has the potential for significant socio-economic cost impacts associated with the loss of fishing ground arising from potential offshore windfarm development in NE7. Consultation will be required with the Ministry of Defence regarding potential radar interference from turbines. There is potential to affect bird species. The distance offshore reduces the potential risk to birds foraging in this area, however there may be species that transit through these offshore areas as part of migration routes. It lists a range of potential negative impacts identified through plan-level SEA, HRA and Strategic EIA, which require further consideration through project level assessments, including: loss of/damage to marine and coastal habitats; effects from pollution releases on species and habitats; effects on subsea geology, sediments and coastal processes arising from changes in hydrodynamics and existing wave regimes; issues relating to navigational safety, aviation and collision risk; effects on marine and coastal characters and visual receptors; contribution to supporting a diverse and decarbonised energy sector; effects nor mesidential amenity; loss of/damage to historic environment features and their settings; effects on water quality; and effects on ecological status.

- Shipping and navigation
- Marine archaeology and cultural heritage
- Infrastructure and other marine user
- Climate resilience
- Socio-economics
- Telecommunications and interference
- Civil and military aviation
- Underwater noise and vibration
- Offshore and intertidal ornithology
- Commercial fisheries
- Socio-economics
- Civil and military aviation
- Telecommunications and interference

Plan	Policy	Summary
Aberdeenshire LDP 2023	The Modified Proposed Aberdeenshire LI revoked. It is acknowledged that Supplem	DP 2020 was recently adopted by Aberdeenshire Council on 13 th January 2023. As such, the Aberdeenshire L nentary Guidance is actively integrated into the Aberdeenshire LDP 2023, rather than acting as standalone do
	Agriculture and Biodiversity: • E1 – Natural Heritage	Policy E1 sets out requirements for new development to not have adverse effects on a nature conservation site designated for its biodiversity or geodiversity importance. Requirements for Protected Species Surveys to assess impact and plans detailing appropriate avoidance and mitigation.
	 Historic Environment and Landscape: R1 – Special Rural Areas R2 – Development Rural Proposals Elsewhere in the Countryside R3 – Minerals P1 – Layout, Siting and Design E2 – Landscape E3 – Forestry and Woodland HE1 – Protected Listed Budlings, Scheduled Monuments and Archaeological Sites (including other historic buildings) HE2 – Protecting Historic, Cultural and Conservation Areas 	 Policy R1 will restrict small scale development in the coastal zone to reflect the special nature of these areas. The policy also mentions that in the coastal zone development must require a coastal location unless clear social, economic or community benefits arise. No coalescence of coastal developments or adverse impacts on natural habitats or processes permitted. The policy will also look to support development associated with coastal protection works where it is evidenced that the works respect natural processes, no significant adverse impact on coastal processes or habitats, and it would not result in increased coastal erosion or flooding. Protection works should be futureproofed against climate change projections. Policy R2 looks at the siting and design of any new development and identifies it will be a primary consideration as well as compliance with other relevant policies. The reuse of brownfield land will always be preferred over greenfield land. Policy R3 relates to protecting mineral sites and creating safeguards. Policy P1 looks at requirements for developments, in terms of scale, nature and to participate in a Design Review Process at the discretion of the Planning and Environment Service. The policy also includes measures to enhance biodiversity in proportion to the opportunities available and the scale of the development site, the Council may require off-site contributions towards biodiversity enhancement within the settlement. These obligations may be controlled by conditions. Policy E3 sets out requirements for new developments to continue to ensure that opportunities are taken to promote the role of woodlands in providing opportunities for community development, education, and recreational access, protecting and enhancing environmental quality and biodiversity, landscape and historic assets. Policy H2 sets out requirements for new development to not have a negative effect on the character, integrity or setting of listed buildings, schedul
	 Physical Environment: P4 – Hazardous and Potentially Polluting Developments and Contaminated Land PR1 – Protecting Important Resources 	Policy P4 sets out requirements for new developments to not create risk of significant pollution, create a significant nuisance (for example through impacts on air quality or noise), or present an unacceptable danger to the public or the environment. Policy PR1 sets out requirements for new development to not have a negative effect on important environmental resources associated with air quality, the water environment, prime agricultural land, peat and other carbon rich soil, open space and important trees and woodland.

Table 1.3 Relevant local planning policies relevant to the Project

Relevant aspect

LDP (2017) & Supplementary Guidance are ocumentation.

Ground conditions and contamination Terrestrial ecology and ornithology

All

Project description Air Quality Land use Terrestrial ecology and ornithology Ground conditions and contamination Water resources and flood risk Onshore noise and vibration

Plan	Policy	Summary
	 Climate Change: C2 – Renewable Energy C3 – Carbon Sinks and Stores PR2 – Preserving and Protecting Important Development Sites 	 Policy C2.1 supports solar, wind, biomass and hydro-electricity developments that are in appropriate sites and of the appropriate design. Policy C2.2 looks at how wind energy developments will be approved in appropriate locations taking account of the spatial framework mapping. 'Strategic Landscape Capacity Assessment for Wind Energy in Aberdeenshire Final Report' 2014 remains valid. Policy C2.8 requires other renewable energy developments to relate well to the source of the renewable energy required for operation and satisfactory steps must be taken to mitigate any negative impacts on affected properties. Policy C3 sets out requirements to protect carbon sinks and stores, such as woodland and high-carbon peat rich soil, from disturbance or destruction. Policy PR2 seeks to protect sites that may be needed in the future. It also states 'High-voltage electricity transmission infrastructure, including cabling, substations, and convertor stations, will be at a range of the states of
	Flood Risk • C4 – Flooding	Policy C4 looks at requirements for FRAs to be undertaken in accordance with Scottish Environment Protection Agency (SEPA) Technical Flood Risk Guidance and will be required for development in the medium to high category of flood risk.
	 Safety: RD1 – Providing Suitable Services PR3 – Reuse, Recycling and Waste 	Policy RD1 looks at requirements for any new private access onto a public road must be designed to the satisfaction of Aberdeenshire Council's Road and Transportation Services. Policy PR3 looks at requirements for waste management facilities on land used as a waste management or treatment facility. The Project therefore cannot compromise waste handling operations at an existing waste management site.

Seascape / Landscape and visual Socio-economics

All

Water resources and flood risk Climate resilience

Project description Traffic and transport

Plan	Policy	Summary
Aberdeenshire Council Natural Heritage Strategy 2019	 Historic Environment and Landscape Aim 1 – Protection of Natural Heritage Aim 2 – Enhancement of Natural Heritage Aim 3 – Promotion of Natural Heritage 	 Aim 1 sets out: Objective 1.5 – Protect trees of visual and cultural important Objective 1.6 – Protect locally significant sites for nature conservation Aim 2 sets out: Objective 2.1 - Use Council managed land to enhance natural heritage and engage communities Objective 2.2 – Implement management of invasive non-native plant species across Aberdeenshire through partnership working. Objective 2.3 Protection and enhancement of pollinators in Aberdeenshire. Objective 2.4 – Creation and enhancement of pollinators in Aberdeenshire Aim 3 sets out: Objective 3.1 Aberdeenshire Council engages in and promotes key natural heritage issues – Biodiversity of the following species: Common bottlenose dolphin Community tree planting Farmland birds Freshwater pearl mussel Hedgehog Invasive non-native species Peatlands Pine marten Pollinators Red squirrel Wildcat Swift Objective 3.4 - Promote, protect and enhance natural heritage through cross-organisation partnership working, Objective 3.4 - Promote prevention and management of invasive non-native species spread in Aberdeenshire

Benthic, epibenthic and intertidal ecology Marine mammal Terrestrial ecology and ornithology Seascape / Landscape and visual Offshore and intertidal ornithology
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United Nations (UN), (2022). Report of the Conference of the Parties to the Convention on Biological Diversity on its fifteenth meeting. [online] Available at: <u>https://www.cbd.int/doc/c/d707/6fca/f76569ac6b47ae9930a3b251/cop-15-04-en.pdf</u> [Accessed: 25 August 2022] Appendix 4A: Transboundary Screening Matrix

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1. Introduction

- 1.1.1 This Appendix identifies the transboundary receptors of relevance to the Project and considers the potential likely significant effects from construction, operation and maintenance and decommissioning of the offshore and onshore components of the Project on those transboundary receptors.
- 1.1.2 Transboundary effects arise when impacts from a development within Member States ('European Economic Area (EEA) States') affects the environment of another EEA State(s).
- 1.1.3 This transboundary screening matrix has been prepared in accordance with Scottish Government's PAN 2017/1. The primary purpose of this note is to provide a screening assessment of potential transboundary impact that have the potential to affect Member States.

2. Legislative context

- 2.1.1 The United Kingdom (UK) is a signatory to the United Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment (EIA) in a transboundary context. The convention was adopted in 1991 in the Finnish city of Espoo and is therefore known as the 'Espoo Convention'. It was established to enhance the cooperation between EEA States in assessing environmental effects in a transboundary context. Following the exit of the UK from the European Union (EU) in December 2020, the UK is no longer an EU Member State. However, for the purposes of assessing potential transboundary effects, the Espoo Convention remains the foundation of the approach followed for the Project.
- 2.1.2 The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017; The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017; and The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017, hereafter referred to as the 'EIA Regulations 2017' transpose the requirements of the Environmental Impact Assessment Directive (2014/52/EU) (European Parliament, 2014) governing statutory notification and consultation in respect of transboundary impacts of development on other EEA States. **Table 2.1** sets out the Regulations of relevance to the assessment of transboundary effects.

Table 2.1 EIA Regulations 2017 relevant to transboundary effects

EIA Regulations	Relevance to transboundary
Regulation 5 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 Regulation 5 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Regulation 6 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017	Require that an application for an 'EIA project' must be accompanied by an Environmental Impact Assessment Report (EIA Report). The EIA Report must include information stipulated by the Regulations 5 and 6.
Schedule 4 of the EIA Regulations 2017	Requires that description of likely significant effect should include those that are of transboundary nature.
Regulation 29 of The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Regulation 30 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 Regulation 41 of Regulation 5 of The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017	Establish the procedural duties necessary where the Scottish Ministers are of the view that an EIA project is likely to have significant effects on the environment in another EEA State; or where another EEA state is of the view that its environment is likely to be affected by an EIA Project.
Regulation 19 of The Marine Works (Environmental Impact Assessment) Regulation 2007	The appropriate authority must supply a copy of the environmental statement, and any addition information provided by the Applicant.

- 2.1.3 The screening for likely significant effects on the environment of another EEA State may take place at any time when new relevant information becomes available. Where a likely significant effect on the environment of any other EEA State(s) is identified, the role of the Scottish Ministers includes the identification of EEA State(s) to be notified, notification of the State(s) that an effect is likely, consultation with the EEA State(s), and notification to the EEA State(s) of the outcome of the application for the EIA project.
- 2.1.4 Planning Advice Note (PAN) 2017/1 sets out the procedures for consultation in association with an EIA project, where such a project may have significant transboundary impacts.

3. Screening considerations

3.1 Characteristics of the development

- 3.1.1 The Project comprises a new floating offshore wind project located in the NE7 Plan Option from the Scottish Government's Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020), located between 75–110 kilometres (km) offshore (at its nearest and farthest points from shore respectively) of the north-east Aberdeenshire coast. Full Project details can be found in **Chapter 2: Project Description**.
- 3.1.2 The Project comprises onshore and offshore infrastructure associated with a floating offshore wind farm including:
 - floating wind turbine generators (WTGs), with a maximum blade tip height of up to 350m and maximum rotor diameter of up to 326m;
 - floating units used to mount each WTG. These will consist of a floating platform or "floater" that will be stabilised to the seabed by a dedicated "station keeping system". The station keeping system consists primarily of mooring lines and seabed anchors. A number of floating unit designs are under consideration. Mooring concepts being considered are catenary mooring, taut line mooring, and semi-taut mooring;
 - array cabling between the WTGs;
 - offshore platforms including for substations, accommodation, and reactive compensation equipment if required (HVAC only);
 - up to eight offshore export cables (dependent on technology used);
 - landfall site(s), which has/have not yet been determined. The landfall construction method will be specific to the site chosen. Typically either open-cut/cut-and-fill construction or trenches construction (e.g. horizontal directional drilling (HDD)) techniques will be used.
 - up to four onshore export cables per trench, in up to 8 trenches; and
 - up to two onshore substations to enable connection to the electricity transmission network.
- 3.1.3 The construction of the Project will also potentially include associated seabed preparation and, where necessary, scour protection.
- 3.1.4 Any effects and risks associated with pollution, nuisances and accidents have been considered within the Scoping Report in:
 - Section 5.2: Marine water and sediment quality;
 - Section 5.10: Shipping and navigation;
 - Section 5.13: Infrastructure and other marine users;
 - Section 6.1: Ground conditions and contamination;
 - Section 6.2: Air quality;
 - Section 6.3: Water resources and flood risk; and
 - Section 6.7: Onshore noise and vibration.

4. Location of Project and geographical area

4.1 Existing use

- 4.1.1 The Project's generating infrastructure will be located in the North Sea, within the 'Scottish Zone' (as defined in the Scotland Act 1998) of the UK Exclusive Economic Zone (EEZ). It will be located within the Option Area Agreement (OAA), which is the spatial boundary of the NE7 Plan Option, as defined in the Scottish Government's Sectoral Marine Plan (Scottish Government, 2020). The OAA is located northeast of Rattray Head on the Aberdeenshire coast in northeast Scotland. The OAA (and therefore the Project's generating infrastructure) is located approximately 75km at its nearest point to shore and 110km at its furthest point.
- 4.1.2 The Scoping Boundary (illustrated in **Figure 1.1: Scoping Boundary** of **Appendix 1A**), used to inform this Scoping Report, is defined as the area within which the Project and associated infrastructure will be located, including the temporary and permanent construction and operational work areas.
- 4.1.3 The offshore element of the Scoping Boundary includes the wind farm OAA, which covers a surface area of approximately 684km². A marine area between the OAA and the coastline encompasses the offshore export cable corridor search area and the landfall search area. The landfall search area runs from Sandhaven on the north coast (west of Fraserburgh) to Sandford Bay (south of Peterhead). The Scoping Boundary includes an additional 2.5km buffer at either end of the landfall search area to allow for future design flexibility (further detail is provided in **Section 2.4** in **Chapter 2: Project Description**). An offshore export cable corridor (yet to be determined) will link the OAA to landfall(s) within this search area.

Distance to other EEA states

4.1.4 The Scoping Boundary includes areas outside the 12nm UK limit. Given the nature of the Project, it has been considered that the Project may potentially have transboundary interactions with other EEA States. These, and their respective distances from the Project area, are outlined in **Figure 4.1** and **Table 4.1**.



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Table 4.1Distance from EEZ

EEZ	Distance from Scoping Boundary (km)
Denmark	302km
Norway	115km
Netherlands	329km
Sweden	614km
Germany	318km

4.2 **Screening tables**

- 4.2.1 **Table 4.2** sets out the key environmental designations considered as part of the assessment on likely significant transboundary effects.
- 4.2.2 A transboundary screening matrix has been completed for potential effects for the physical, biological and human environments, both onshore and offshore, that could arise from the Project. The conclusions presented have been drawn from the assessment undertaken to date through the Scoping process. Any likely significant transboundary effects identified at this stage will be accounted for in the EIA Report and Habitats Regulation Appraisal (HRA).
- 4.2.3 The extent of the area likely to affect a jurisdiction of another EEA state is considered in:
 - Table 4.3:Offshore physical and biological environment;
 - Table 4.4:Offshore human environment;
 - Table 4.5: Onshore environment; and
 - Table 4.6: Whole-project environment. Table 4.5

Торіс	Constraint	Designated feature(s)	Approxima Boundary
Biodiversity (terrestrial, ornithological and intertidal)	Buchan Ness to Collieston Coast Special Protection Area (SPA) (overlaps Buchan Ness to Collieston Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI); Bullers of Buchan Coast SAC; Collieston to Whinnyfold SSSI; Ythan Estuary, and Sands of Forvie and Meikle Loch SPA)	Black-legged kittiwake <i>Rissa tridactyla</i> (breeding); Common guillemot <i>Uria aalge</i> (breeding); Herring gull <i>Larus argentatus</i> (breeding; European shag <i>Phalacrocorax</i> (breeding); and Northern fulmar <i>Fulmarus glacialis</i> (breeding).	Overlaps S
Biodiversity (terrestrial, ornithological and intertidal)	Buchan Ness to Collieston SAC (overlaps Buchan Ness to Collieston SSSI; Buchan Ness to Collieston SPA; Bullers of Buchan Coast SAC; and Ythan Estuary, Sands of Forvie and Meikle Loch SPA)	Annex I habitat that are a primary reason for selection of this site 'vegetated sea cliffs of the Atlantic and Baltic coasts'.	Overlaps S
Biodiversity (terrestrial, ornithological and intertidal)	Buchan Ness to Collieston SSSI (overlaps Buchan Ness to Collieston SPA and SAC; Buller of Buchan Coast SAC; Collieston to Whinnyfold SSSI; and Ythan Estuary and Sands of Forvie and Meikle Loch SPA)	Designated for fixed coastal dunes with herbaceous vegetation ("grey dunes"); European dry heaths; and petrifying springs with tufa formation (Cratoneurion).	Overlaps S
Biodiversity (terrestrial, ornithological and intertidal)	Buller of Buchan Coast SSSI (overlaps Buchan Ness to Collieston SAC, SPA and SSSI)	Vegetated sea cliffs; Breeding seabird assemblage; Kittiwake (breeding); Guillemot (breeding); and Shag.	Overlaps S
Biodiversity (terrestrial, ornithological and intertidal)	Loch of Strathbeg SPA (overlaps Loch of Strathbeg SSSI and Ramsar site)	This site is designated for the Annex I species Sandwich tern <i>Sterna sandvicensis</i> (breeding), whooper swan (non-breeding), and Svalbard barnacle good <i>Branta leucpsos</i> (non-breeding). This site is designated for the migratory species pink-footed goose (non-breeding) and greylag goose (non-breeding). The site regularly supports in excess of 20,000 individual waterfowl including, teal <i>Anas crecca</i> (non-breeding), and goldeneye (non-breeding).	Overlaps S
Biodiversity (terrestrial, ornithological and intertidal)	Loch of Strathbeg Ramsar site (overlaps Loch of Strathbeg SPA and SSSI)	 Qualifies under Ramsar criterion 1 by virtue of it containing the largest dune slack pool in Britain. Qualifies under Ramsar criterion 2 by supporting breeding Sandwich tern. Qualifies under Ramsar criterion 4 by supporting waterbird species at a critical stage in their life cycle, including teal (non-breeding) and goldeneye (non-breeding). Qualifies under Ramsar criterion 5 by regularly supporting waterbirds in numbers of 20,000 individuals or more. Qualifies under Ramsar criterion 6 by regularly supporting 1% or more of the individuals in a population of waterbirds, including non-breeding pink-footed goose, greylag goose, whooper sawn and Svalbard barnacle goose. 	Overlaps S
Biodiversity (terrestrial, ornithological and intertidal)	Loch of Strathbeg SSSI (overlaps Loch of Strathbeg SPA and Ramsar site)	Sand dunes; Saltmarsh; Eutrophic loch; Open water transition fed; Fen-meadow; Breeding bird assemblage; Pink-footed goose <i>Anser brachyrhynchus</i> (non-breeding);	Overlaps S

Table 4.2 Key European and National Site Network designations considered

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Scoping Boundary

MarramWind Offshore Wind Farm Environmental Impact Assessment – Scoping Report Appendix 4A: Transboundary Screening Matrix

Торіс	Constraint	Designated feature(s)	Approxir Boundar
		Greylag goose <i>Anser Anser</i> (non-breeding); Whooper swan <i>Cygnus</i> (non-breeding); and Goldeneye <i>Bucephala clangula</i> (non-breeding).	
Biodiversity (terrestrial, ornithological and intertidal)	Rosehearty to Fraserburgh Coast SSSI	Curlew <i>Numenius arquata</i> (non-breeding); Eider <i>Somateria mollissima</i> (non-breeding); Purple sandpiper <i>Calidris maritima</i> (non-breeding); and Turnstone <i>Arenaria interpres</i> (non-breeding).	Overlaps
Biodiversity (terrestrial, ornithological and intertidal)	Rora Moss SSSI	Raised bogs.	Overlaps
Biodiversity (terrestrial, ornithological and intertidal)	Ythan Estuary, Sands of Forvie and Meikle Loch SPA (overlaps Buchan Ness to Collieston Coast SAC, SPA and SSSI; Collieston to Whinnyfold SSSI; Sands of Forvie and Ythan Estuary SSSI; Ythan Estuary and Meikle Loch Ramsar site)	This site is designated for the Annex I species Sandwich tern (breeding); common tern <i>Sterna hirundo</i> (breeding); and little tern <i>Sterna albifrons</i> (Breeding). This site is designated for the migratory species pink-footed goose. This site is designated for regularly supporting in excess of 20,000 individual waterfowl, including pink-footed goose; eider; redshank <i>Tringa tetanus</i> and lapwing <i>Vanellus vanellus</i> .	2km sout
Biodiversity (terrestrial, ornithological and intertidal)	Collieston to Whinnyfold SSSI (overlaps Ythan Estuary, Sands of Forvie and Meikle Loch SPA; Buchan Ness to Collieston Coast SPA)	Vegetated sea cliffs, including species such as: carline thistle <i>Carlina vulgaris</i> , cowspli <i>Primula veris</i> and sea wormwood <i>Seriphidium maritimum</i> ; Maritime cliff seabird colony, including: Kittiwake; Guillemot; Fulmar; Razorbill <i>Alca torda;</i> and Puffin <i>Fractercula artica</i> .	4.6km so
Biodiversity (terrestrial, ornithological and intertidal)	Meikle Loch and Kippet Hills SSSI	Non-breeding greylag goose; and Non-breeding pink-footed goose.	6.5km so
Biodiversity (terrestrial, ornithological and intertidal)	Sands of Forvie SAC (overlaps Sands of Forvie and Ythan Estuary SSSI; Ythan Estuary and Meikle Loch Ramsar site; Ythan Estuary, Sands of Forvie and Meikle Loch SPA; and Buchan Ness to Collieston Coast SPA)	Annex I habitats that are a primary reason for selection of this site include: Embryonic shifting dunes; "Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")'; Decalcified fixed dunes with <i>Empetrum nigrum</i> (PMF); and Humid dune slacks.	9.3km so
Biodiversity (terrestrial, ornithological and intertidal)	Sands of Forvie and Ythan Estuary SSSI (overlaps with Ythan Estuary and Meikle Loch Ramsar site; Sands of Forvie SAC; and Ythan Estuary, Sands of Forvie and Meikle Loch)	Sand dunes, including shift dunes colonised by marram grass <i>A.arenaria</i> , semi-fixed and fixed marram communities; Estuary habitat of the Ythan Estuary; Saltmarsh habitat; Vascular plant assemblage; Breeding bird assemblage; Arctic tern <i>Sterna paradisaea</i> (breeding); Common tern (breeding); Little tern (breeding); Eider (breeding); Sandwich tern (breeding); Eider (breeding); Wildfowl assemblage (non-breeding); Eide (non-breeding); and Pink-footed goose (non-breeding).	9.3km so

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MarramWind Offshore Wind Farm Environmental Impact Assessment – Scoping Report Appendix 4A: Transboundary Screening Matrix

Торіс	Constraint	Designated feature(s)	Approxir Boundar
Biodiversity (terrestrial, ornithological and intertidal)	Ythan Estuary and Meikle Loch Ramsar site (overlaps Sands of Forvie and Ythan Estuary SSSI; Sands of Forvie SAC; and Ythan Estuary, Sands of Forvie and Meikle Loch SPA)	Qualifies under Ramsar criterion 2 by supporting common tern (breeding) and little tern (breeding). Qualifies under Ramsar criterion 4 by supporting waterbird species at a critical stage in their life cycle, including eider (non-breeding); redshank (non-breeding); and lapwing (non-breeding). Qualifies under Ramsar criterion 5 by regularly supporting waterbirds in numbers of 20,000 individuals or more. Qualifies under Ramsar criterion 6 by regularly supporting 1% or more of the individuals in a population of waterbirds, including sandwich tern (breeding and pink- footed goose (non-breeding).	7.7km so
Biodiversity (terrestrial, ornithological and intertidal)	Turclossie Moss SAC (overlaps Turclossie Moss SSSI)	Designated for Annex I habitat 'active raised bogs' as primary reason; other qualifying feature is annex I habitat 'degraded raised bogs still capable of natural regeneration'.	0.2km we
Biodiversity (terrestrial, ornithological and intertidal)	Turclossie Moss SSSI (overlaps Turclossie Moss SAC)	Intermediate bog (raised)	0.2km we
Biodiversity (terrestrial, ornithological and intertidal)	Tore of Troup SSSI	Upland mixed ash woodland; Upland birch woodland; and Upland assemblage.	3.6km we
Biodiversity (terrestrial, ornithological and intertidal)	Troup, Pennan and Lion's Heads SPA (overlaps Southern Trench MPA)	The site regularly supporting over 20,000 individual breeding seabirds: Northern fulmar; Herring gull; and Razorbill. The site qualifies by regularly supporting internationally important breeding populations of the migratory species: Black-legged kittiwake (breeding); and Common guillemot (non-breeding).	3km wes
Biodiversity (terrestrial, ornithological and intertidal)	Moray Firth SPA (overlaps Southern Trench MPA; Lower River Spey – Spey Bay SAC; River Spey SAC; and Moray and Nairn Ramsar site)	The site regularly supports non-breeding population of European importance of the following Annex I species: Great northern diver <i>Gavia immer;</i> Red-throated diver <i>Gavia stellata</i> ; and Slavonian grebe <i>Podiceps auratus.</i> The site regularly supports populations of European importance of the following migratory species: Greater scaup <i>Aythya marila</i> (non-breeding); Common eider (non-breeding); Long-tailed duck <i>Clangula hyemalis</i> (non-breeding); Common scoter <i>Melanitta nigra</i> (non-breeding); Velvet scoter <i>Melanitta fusca</i> (non-breeding); Common goldeneye (non-breeding); Red-breasted merganser <i>Mergus serrator</i> (non-breeding); and European shag (non-breeding).	37.3km w
Geological (terrestrial, ornithological and intertidal)	Loch of Strathbeg SSSI (overlaps Loch of Strathbeg SPA and Ramsar site)	Geological feature coastal geomorphology of Scotland.	Overlaps
Geological (terrestrial, ornithological and intertidal)	Cairnbulg to St Combs Coast SSSI	Geological feature of structural and metamorphic geology: Dalradian.	Overlaps
Geological (terrestrial, ornithological and intertidal)	Rosehearty to Fraserburgh Coast SSSI	Geological feature of structural and metamorphic geology: Dalradian.	Overlaps

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Environmental Impact Assessment – Scoping Report Appendix 4A: Transboundary Screening Matrix

Торіс	Constraint	Designated feature(s)	Approxim Boundary
Geological (terrestrial, ornithological and intertidal)	Philorth Valley SSSI	Geological feature of Quaternary of Scotland.	Overlaps S
Geological (terrestrial, ornithological and intertidal)	Moss of Cruden SSSI	Geological feature of Quaternary of Scotland.	Overlaps S
Geological (terrestrial, ornithological and intertidal)	Buller of Buchan Coast SSSI (overlaps Buchan Ness to Collieston SAC, SPA and SSSI)	Geological feature of Coastal geomorphology of Scotland.	Overlaps S
Geological (terrestrial, ornithological and intertidal)	Collieston to Whinnyfold SSSI (overlaps Ythan Estuary, Sands of Forvie and Meikle Loch SPA; Buchan Ness to Collieston Coast SPA)	Geological feature of structural and metamorphic geology: Dalradian.	4.6km sout
Geological (terrestrial, ornithological and intertidal)	Bellscamphie SSSI	Quaternary geology and geomorphology, including the Bellscamphie Lower Till, Bellscamphie Middle Till, Bellscamphie Upper Till, and Bellscamphie Gravels.	4.9km sout
Geological (terrestrial, ornithological and intertidal)	Meikle Loch and Kippet Hills SSSI	Quaternary geology and geomorphology, including landforms and deposits of sand and gravel associated with the 'red drift', laid down by the last ice-sheet.	6.5km sout
Geological (terrestrial, ornithological and intertidal)	Sands of Forvie and Ythan Estuary SSSI (overlaps with Ythan Estuary and Meikle Loch Ramsar site; Sands of Forvie SAC; and Ythan Estuary, Sands of Forvie and Meikle Loch)	Geological feature of coastal geomorphology of Scotland.	9.3km sout
Biodiversity (marine)	Southern Trench Marine Protected Area (MPA) (overlaps Gamrie and Pennan Coast SPA and Moray Firth SPA	Minke whale <i>Balaenoptera acutorostrata;</i> the priority marine feature (PMF) and OSPAR threatened and declining habitat 'burrowed mud'; fronts; and shelf deeps.	Overlaps S
Biodiversity (marine)	Turbot Bank MPA	Sandeels.	14km sout proposed e
Biodiversity (marine)	Braemar Pockmarks MPA	Annex I habitat 'submarine structures made by leaking gases'.	50km north
Biodiversity (marine)	Scanner Pockmark MPA	Annex I habitat 'submarine structures made by leaking gases'.	50km north
Biodiversity (marine)	River Dee SAC	Atlantic salmon Salmo salar and freshwater pearl mussel Margaritifera margaritifera.	39km soutl
Biodiversity (marine)	River South Esk	Atlantic salmon and freshwater pearl mussel.	90km soutl
Biodiversity (marine)	River Tay	Atlantic salmon, sea lamprey Petromyzon marinus, brook lamprey Lampetra planeri and river lamprey Lampetra fluviatilis.	120km sou
Biodiversity (marine)	River Teith	Atlantic salmon, sea lamprey, brook lamprey and river lamprey.	200km sou
Biodiversity (marine)	River Tweed	Atlantic salmon, sea lamprey, brook lamprey and river lamprey	200km sou
Geodiversity (marine)	Southern Trench Marine Protected Area (MPA) (overlaps Gamrie and Pennan Coast SPA and Moray Firth SPA	Quaternary of Scotland – sub-glacial tunnel valleys and – slide scars; and Submarine Mass Movement.	Overlaps S

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Table 4.3 Offshore transboundary screening matrix: physical and biological environment

Screening criteria	Marine geology, oceanography and physical processes	Marine water and sediment quality	Underwater noise and vibration	Electromagnetic Fields (EMF)	Benthic, epibenthic and intertidal ecology	Marine mammals	Offshore and intertidal ornithology – Offshore
Characteristics of the development					See Section 3.1.		
Geographical area					See Section 4.		
Location of development (including existing use)					See Section 4.		
Cumulative impacts			For po	otential cumulative effects	see the 'Cumulative ef	fects' subsection of eac	ch section.
Potential impacts and carrier Environmental importance Extent	No significant transboundary impacts are predicted due to the localised and small-scale nature of the impacts on marine geology, oceanography and physical processes. Predicted impacts effects upon receptors are considered likely to be limited to the Project footprint for direct effects and one tidal excursion for indirect effects such as sediment transport and deposition.	No significant transboundary impacts are predicted due to the localised and small-scale nature of the expected impacts on marine water and sediment quality.	There is potential for transboundary effects on noise- sensitive receptors during the construction, operation, maintenance and decommissioning of the Project.	No significant transboundary impacts in EMF are predicted due to the localised and small-scale nature of the impact.	No significant transboundary impacts are predicted as the extent of any predicted impacts upon benthic and intertidal ecological receptors are likely to be limited in extent and localised in nature being limited to the Project footprint for direct effects and one tidal excursion for indirect effects such as sediment transport and deposition.	There is potential for transboundary effects upon marine mammals during the construction, operation and maintenance, and decommissioning of the Project. Although the Project is situated within Scottish waters, marine mammals are typically highly mobile, with large foraging ranges and / or may migrate over large distances for key life-history events (e.g. breeding and calving). In the UK, cetacean populations are managed using management units (MU; IAMMWG, 2021), which for some species are large geographic areas that cross into other territorial waters. An example of this is the North Sea MU, which is applicable to	The Project alone and cumulative impact assessments may affect offshore bird populations located outside UK territorial water, giving the potential for transboundary impacts. The area of search for Transboundary offshore wind farms is likely to be the North Sea. Transboundary offshore wind farms will be screened for the potential to impact on the same bird populations as are present at the Project proposed development site. If transboundary sites are screened in, impacts will be assessed as per the other cumulative impacts.

Offshore and intertidal ornithology – Intertidal Fish and shellfish ecology

No significant transboundary impacts are predicted due to the wide-ranging nature of seabirds (especially in the non-breeding season) and migratory birds. The potential for transboundary effects upon fish during the construction, operation, maintenance, and decommissioning of the Project has been identified. Some fish can migrate over large geographic areas that cross into other territorial waters for key life stages. No transboundary impacts are predicted on . shellfish due to the localised and temporary nature of the works.

Screening criteria	Marine geology, oceanography and physical processes	Marine water and sediment quality	Underwater noise and vibration	Electromagnetic Fields (EMF)	Benthic, epibenthic and intertidal ecology	Marine mammals	Offshore and intertidal ornithology – Offshore	Offshore and intertidal ornithology – Intertidal	Fish and shellfish ecology
						harbour porpoise and spans territorial waters of the UK, Norway, Denmark, Germany, the Netherlands, Belgium, and France. Therefore, depending on the significance of the effects identified in the Project assessment (e.g. underwater noise modelling) and the Cumulative Impact Assessment (CIA), transboundary effects may require assessment.			
Magnitude		For potential Tra	ansboundary impacts sc	oped in at this stage it is n	ot yet possible to asce	rtain magnitude, this w	ill however be determined in	the EIA process.	
Probability Duration Frequency Reversibility	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	Depending on the findings of other impact assessments (e.g. on marine mammals and fish), transboundary effect may require assessment.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	Depending on the significance of the effects identified in the Project assessment (e.g. underwater noise modelling) and the Cumulative Effect Assessment (CEA), transboundary effects may require assessment.	Depending on if transboundary offshore wind farm will be screened for the potential to impact on the same bird populations as are present at the Project proposed development site. If transboundary sites are screened in, impacts will be assessed as per the other cumulative impacts.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted for shellfish species. For fish species the transboundary effects will be dependent on effects identified in the Project assessment (e.g. underwater noise modelling) and the CEA, which may require a transboundary effects assessment.
Screened in / out	Screened out	Screened out	Screened in	Screened out	Screened out	Screened in	Screened in	Screened out	Screened in

Table 4.4 Offshore transboundary screening matrix: human environment

Screening criteria	Commercial fisheries	Shipping and navigation	Marine archaeology and cultural heritage	Seascape, landscape and visual (SLVIA)	Infrastructure and other marine users
Characteristics of the development			See Section 3.1.		
Geographical area			See Section 4.		
Location of development (including existing use)	See Section 4.				
Cumulative impacts		For potential cumulativ	ve effects see the 'Cumulative effects' subsect	ion of each section.	
Potential impacts and carrier Environmental Importance Extent	No significant transboundary impacts are predicted as any potential displacement of fishing activity into the Norwegian EEZ is expected to be highly unlikely based on data reviewed within this Scoping Report.	The potential for transboundary effects associated with vessels transiting to/from outside of the United Kingdom including transboundary ports has been identified.	No transboundary impacts have been identified due to the relatively localised nature of the potential effects.	No transboundary effects have been identified and there is no potential for offshore elements of the Project to have a significant effect on the SLVIA receptors of an adjacent state.	No transboundary impacts have been identified due to all likely interactions with Infrastructure and Other Marine Users to be within UK territorial waters.
Magnitude	For potentia	al Transboundary impacts scoped in at this sta	age it is not yet possible to ascertain magnitud	e, this will however be determined in th	ne EIA process.
Probability Frequency Reversibility	No significant transboundary impacts are predicted	Transboundary impacts will be considered within the in-isolation assessment, and cumulatively with the presence of other offshore developments and activities within the CEA.	No significant transboundary impacts are predicted	No significant transboundary impacts are predicted	No significant transboundary impacts are predicted
Screened in / out	Screened out	Screened in	Screened out	Screened out	Screened out

Table 4.5 Onshore transboundary screening matrix

Screening criteria	Ground conditions and contamination	Air quality	Water resources and flood risk	Land use	Terrestrial ecology and ornithology	Onshore archaeology and cultural heritage	Onshore noise and vibration	Tr
Characteristics of the development					See Section 3.1.			
Geographical area					See Section 4.			
Location of development (including existing use)					See Section 4.			
Cumulative impacts			For p	otential cumulative effect	ts see the 'Cumulative ef	fects' subsection of each	section.	
Potential impacts and carrier Environmental Importance Extent	No transboundary impacts from ground condition and contamination receptors are anticipated from the Project. Based on the knowledge of the baseline environment, the nature of planned works, professional experience and the history of evidence on the potential for impact from such projects more widely, there are not considered to be any transboundary effects on ground condition and contamination receptors from the Project.	No transboundary impacts from air quality, dust or odour are anticipated from the Project.	No significant transboundary impacts beyond the Scottish national borders have been identified for the water resources and flood risk aspect.	No transboundary impacts have been identified due to the relatively localised nature of the potential effects.	No transboundary impacts have been identified as there is no potential for onshore elements of the Project to have a significant effect on the onshore ecology and ornithology, including the qualifying interest features of European sites, of an adjacent State.	No transboundary impacts have been identified due to the relatively localised nature of the potential effects.	No transboundary impacts have been identified due to noise and vibration. There are no onshore noise sensitive receptors beyond the jurisdiction to the UK.	Th as tra im idu poo ha Sh du th m re ap as pr
Magnitude		For potential Tr	ansboundary impacts sc	oped in at this stage it is	not yet possible to ascer	rtain magnitude, this will	however be determined in	n th
Probability Frequency Reversibility	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	No significant transboundary impacts are predicted.	To fo of co

raffic and transport Landscape and

visual (LVIA)

he need for an ssessment of ansboundary npacts will be dentified once the ort required for onstruction activities as been identified. hould this change uring the life cycle of ne Project then this nay need to be eviewed and ppropriate ssessment/mitigation rovided.

No transboundary impacts have been identified as there is no potential for onshore elements of the Project to have a significant effect on the LVIA features of an adjacent state.

he EIA process.

o be confirmed ollowing identification f port required for onstruction.

No significant transboundary impacts are predicted.

Screening	Ground conditions and	Air quality	Water resources	Land use	Terrestrial ecology	Onshore archaeology and	Onshore noise and vibration	Т
chiena	contamination				and erminelegy	cultural heritage		
Screened in / out	Screened out	Screened out	Screened out	Screened out	Screened out	Screened out	Screened out	To fo id re
								C

raffic and transport Landscape and visual (LVIA)

Screened out

o be confirmed ollowing dentification of port equired for onstruction.

Table 4.6Whole-project transboundary screening matrix

Screening criteria	Climate resilience	Greenhouse gases	Socio-economics
Characteristics of the development		See Se	ction 3.1.
Geographical area		See S	ection 4.
Location of development (including existing use)		See S	ection 4.
Cumulative impacts		For potential cumulative effects see the 'Co	umulative effects' subsection of each section.
Potential impacts and carrier Environmental Importance Extent	The Climate Change Resilience assessment assesses the effects of climate change on the Project as a receptor. No transboundary effects are anticipated on the basis that climate change adaptation effects and impacts are specific to the development and will not result in impacts to an adjacent state.	The contextualisation of GHG emissions, by its nature, incorporates potential transboundary impacts.	An extended supply chain for labour, services, equipment or materials may lead to transboundary socio-economic impacts outside the UK. However, the level of purchases arising from the Project is considered small compared to the size of the well- developed international markets in which they take place and the assessment of effects is proposed to be scoped out.
Magnitude	For potential Transbound	ary impacts scoped in at this stage it is not yet poss	ible to ascertain magnitude, this will however be dete
Probability Frequency Reversibility	No significant transboundary impacts are predicted.	The assessment methodology includes contextualisation against the UK and Scottish carbon budgets and net zero targets.	No significant transboundary impacts are predicted.
Screened in / out	Screened out	Screened in	Screened out

Military and civil aviation and telecommunications

Due to the localised nature of potential impacts, transboundary impacts are considered unlikely to occur.

ermined in the EIA process.

No significant transboundary impacts are predicted.

Screened out

5. Consultation

- 5.1.1 Where there is potential for a proposed development to have significant effects on the environment of another EEA State(s) (or where the Scottish Ministers receives a request for involvement from an EEA State), the Scottish Ministers are required to undertake a consultation and notification process under:
 - Under Regulation 29, for The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
 - Regulation 30 of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
 - Regulation 20 of The Marine Works (Environmental Impact Assessment) Regulations 2007; and
 - Regulation 41 of The Town and County Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
- 5.1.2 The Applicant has followed the guidance provided within PAN 2017/1 in undertaking the screening of potential transboundary effects in order to identify likely significant effects in the environment in other EEA States, thereby informing this consultation process.

6. Summary

- 6.1.1 On the basis of current information, there is the potential for significant effects arising from the Project on the interests of EEA States and as such transboundary effects may arise. Those impacts for which a transboundary effect may arise, and which are therefore screened into the EIA, are as follows:
 - underwater noise and vibration;
 - marine mammals;
 - offshore ornithology;
 - fish and shellfish ecology;
 - shipping and navigation,
 - traffic and transport (to be confirmed following identification of port required for construction); and
 - greenhouse gases.

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Appendix 4B:

Nature Conservation Marine Protected Area Assessment

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Figure 3.1 Sites proposed to be screened into the MPA assessment for the Project on the basis of preliminary screening 7

1. Introduction

1.1 Background

- 1.1.1 The Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009 introduced provisions to support the management of Nature Conservation (NC) Marine Protected Areas (MPAs). Under section 93 of the Marine (Scotland) Act 2010 and section 126 of the Marine and Coastal Access Act 2009, Marine Scotland Licensing and Operations Team (MS-LOT), as the competent authority, is required to consider whether a licensable activity is capable of affecting (other than insignificantly) a protected feature in a NC MPA or any ecological or geomorphological process on which the conservation of any protected feature in a NC MPA is dependent.
- 1.1.2 MS-LOT must not grant authorisation of an activity unless the person applying for the authorisation satisfies MS-LOT that there is no significant risk of the activity hindering the achievement of the conservation objectives for the NC MPA. If MS-LOT believes that there is or may be a significant risk of a proposal hindering the achievement of the conservation objectives, then they must notify the conservation bodies (NatureScot for MPAs within 12 nautical miles (nm) or the Joint Nature Conservation Committee (JNCC) for MPAs outwith 12nm) of that fact.
- 1.1.3 If MarramWind Limited (hereafter referred to as 'the Applicant') is not able to satisfy MS-LOT that there is no significant risk of the licensable activity hindering the achievement of the conservation objectives, then a licence will only be granted if:
 - MS-LOT is satisfied that there is no other means of proceeding with the licensable activity that would create a substantially lower risk of hindering the achievement of those objectives (to include proceeding in another manner or at another location);
 - MS-LOT is satisfied that the benefit to the public of proceeding with the licensable activity clearly outweighs the risk of damage to the environment that will be created by proceeding with it; and
 - MS-LOT is satisfied that the Applicant will undertake, or make arrangements for the undertaking of, measures of environmental benefit equivalent to the damage that the activity will or is likely to have in or on the MPA concerned.
- 1.1.4 The purpose of this document is to outline the proposed approach for a NC MPA Assessment for the Project. This is submitted with the Scoping Report for the Project to enable a Scoping Opinion on the proposed approach to be provided by MS-LOT.
- 1.1.5 The necessary stages of a NC MPA Assessment are described in **Section 2**. This document presents the Stage 1 assessment/initial screening findings of designated MPAs, which are proposed to be carried forward for consideration in the MPA Assessment in the EIA Report.

2. The Marine Protected Area Assessment Process

- 2.1.1 This document has been prepared in line with relevant guidance published in 2013 "*Nature Conservation Marine Protected Areas: Draft Management Handbook*" (Scottish Government, 2013).
- 2.1.2 Marine licences will be required to undertake prescribed marine licensable activities for the Project, including deposition of cables or other objects on or within the seabed, installation of any necessary cable protection, installation of station keeping systems consisting primarily of mooring lines and seabed anchors, and the installation of any wider infrastructure or substructures required.
- 2.1.3 The assessment has two sequential stages:
 - Stage one: initial screening; and
 - Stage two: main assessment.

2.2 Stage one: initial screening

- 2.2.1 An initial screening stage should be undertaken to focus on what can reasonably be predicted as a consequence of the proposed Project and whether it is 'capable of affecting other than insignificantly', a protected feature of a NC MPA. The initial screening should use information that is currently available and consider aspects such as the scale, timing and duration of the proposed activities/development. These considerations should include proposals for developments or activities out-with the boundary of a NC MPA.
- 2.2.2 Firstly, consideration of 'capable of affecting' should result in removing from further consideration all proposals / functions that are not in any way connected to the protected feature(s). A capability that is both remote (in terms of likelihood of occurrence) and hypothetical should not be the basis of a conclusion that further assessment is required. This can be determined by considering whether the activity will exert pressures that the protected feature(s) are sensitive to.
- 2.2.3 Secondly, if it is concluded that the Project is 'capable of affecting', the focus should then be on considering whether the proposed development or activity will affect the protected features of a NC MPA, other than insignificantly. Consideration of the degree of pressure that could be exerted by the activity on a spatial basis should help to establish what level of effect might occur.
- 2.2.4 In circumstances where the conclusion is that the act or function is 'capable of affecting' (other than insignificantly) the protected features of a NC MPA, then the main assessment must be carried out considering the conservation objectives.

2.3 **Stage two: main assessment**

2.3.1 If required following the initial screening stage one, the stage two main assessment will focus on determining whether the exercise of a function will or may significantly hinder (section 82 of the Marine (Scotland) Act 2010 or section 125 Marine and Coastal Access Act 2009), or there is or may be a significant risk of the act hindering (section 83 of the Marine (Scotland) Act 2010 or section 126 of the Marine and Coastal Access Act 2009), the

achievement of the conservation objectives. The approach to this assessment is similar, therefore, to simplify the description this section only refers to 'significant risk of hindering'.

- 2.3.2 Consideration must be carried out on a case-by-case basis of whether there may be a 'significant risk of hindering' the achievement of the conservation objectives of the protected features of a NC MPA. In carrying out the main assessment, it may be that further data needs to be collated or collected to provide sufficient evidence.
- 2.3.3 As with the initial screening, aspects such as scale, timing and duration of the proposed activities or developments should all be considered. However, whilst the initial screening focuses on the protected features, the main assessment focuses on the potential impact on the achievement the conservation objectives of the protected features. Therefore, the main assessment stage will also include consideration of the scale of the potential impact. Consideration of cumulative effects with other activities and functions should also be undertaken in line with Environmental Impact Assessment (EIA) requirements.
- 2.3.4 The assessment should build on the initial screening assessment described in **Section 2.2** that considers the pressures associated with the activity and the sensitivity of the protected features, and information on the likely spatial overlap. To determine whether there is a 'significant risk of hindering' the achievement of the conservation objectives of the protected features of a NC MPA aspects such as the intensity, frequency, and duration of any activities associated with the function or act should be considered.
- 2.3.5 The conservation objectives for MPA features are high-level criteria (Scottish Government, 2013) describing the desired condition of the MPA feature. There are two objectives for features within an MPA, which are that the protected features:
 - so far as already favourable condition, remain in such condition; and
 - so far as not already in favourable condition, be brought into such condition, and remain in such condition.
- 2.3.6 The MPA main assessment for the Project will therefore consider whether the Project could potentially affect these objectives for each of the MPAs screened into the assessment. An assessment will be made of whether the Project could potentially impact the site so that the feature(s) are no longer in favourable condition or prevent the feature(s) from recovering to a favourable condition.

2.4 Identification of relevant MPAs / study scope

- 2.4.1 A review of Project information was completed, including the identification of the potential zones of influence (ZOI) that may arise from the construction, operation and maintenance, and decommissioning of the Project. The Applicant proposes that, in order to determine the ZOI of the activities associated with the Project, the same screening criteria is used for the MPA assessment as will be for the proposed Habitats Regulations Appraisal (HRA) screening, which is currently under development and will be submitted separately to MS-LOT in 2023. These are as follows for the protected features of MPAs:
 - Benthic habitats/species and geodiversity features: there is potential for indirect effects to sites designated for benthic features, as well as geodiversity, as a result of impacts associated with increased suspended sediment concentrations arising from construction activities and from changes to the hydrodynamic regime as a result of the presence of the offshore infrastructure associated with the Project. Physical processes modelling will be undertaken for the Project to inform the EIA Report, however this has not yet been carried out at the Scoping stage. Therefore, a buffer of one mean tidal excursion in the vicinity of the Project equates to approximately 7km, as derived from the Atlas of UK Marine Renewable Energy Resources (ABPmer, 2008). For the purpose

of MPA screening, a precautionary approach has been adopted and this buffer has been increased to 15km. This buffer is considered to be sufficiently precautionary to capture all sites likely to be in the ZOI from direct and indirect effects. This buffer has also been applied for geodiversity features of MPAs.

- **Fish species**: for the purposes of this MPA assessment a precautionary buffer of 100km has been adopted to screen in MPA sites, on the basis that this is sufficiently precautionary to capture the ZOI from the Project from key impacts such as underwater noise. This will however be refined in the EIA Report on the basis of the outputs of the underwater noise assessment and physical processes modelling.
- Marine mammals: the HRA screening considers sites with cetaceans as qualifying interest features within a buffer that equates to the Marine Mammal Management Units, outlined by the Inter Agency Marine Mammal Working Group, as defined in Section 5.6: Marine mammals of the Scoping Report. For seals, all seals within the Moray Firth Seal Management Unit (SMU); East Scotland SMU; and North Coast and Orkney SMU have been considered. These buffers are considered to be sufficiently precautionary to capture all sites likely to be in the ZOI from indirect effects associated with construction activities but will be refined in the EIA Report on the basis of the outputs of the underwater noise assessment and physical processes modelling.
- Ornithology: the HRA screening considers sites with breeding seabirds as qualifying interest features within a buffer that equates to the offshore ornithological study area, as defined in Section 5.7: Offshore and intertidal ecology of the Scoping Report. For the non-breeding season, the ZOI will be the regional Biologically Defined Minimum Population Scale described in literature (Furness, 2015) where the Project is located, which is the UK North Sea. These buffers are considered to be sufficiently precautionary to capture all sites likely to be in the ZOI from indirect effects associated with construction and operational activities, but they will be refined in the EIA Report on the basis of the outputs of the collision risk, displacement and Population Viability Analysis assessments.
- 2.4.2 The MPAs within the search area are presented in **Section 3**. It is proposed that 'insignificance' will be determined for the Project through the assessments made in the EIA Report chapters.

3. Initial Screening for the Project

- 3.1.1 As outlined in **Section 2**, the Applicant has undertaken an initial MPA screening exercise for the purposes of Scoping. This will be revisited once the results of the EIA assessment are available, for example marine geology, oceanography and physical processes, and underwater noise and vibration. The following MPAs have been identified for initial inclusion and illustrated in **Figure 3.1**:
 - Southern Trench NC MPA (overlaps the offshore part of the Scoping Boundary);
 - Turbot Bank NC MPA (approximately 62km south of the windfarm Option Agreement Area (OAA), and 14km south of the wider offshore part of the Scoping Boundary; and
 - East Caithness Cliffs NC MPA (approximately 144km west of the windfarm OAA, 89km northwest of the wider offshore part of the Scoping Boundary.
- 3.1.2 The following subsections present a summary of each MPA included within this initial screening process, the features for which they have been designated, and the general management approaches being implemented. The MPAs are presented in order of increasing distance from the offshore part of the Scoping Boundary. Information for each MPA has been obtained from the MPA's individual site summary, with full details provided in **Section 4**.



3.2 Southern Trench NC MPA

- 3.2.1 Southern Trench NC MPA is located off the Aberdeenshire coast and is designated to protect burrowed mud habitats, fronts and shelf deeps, as well as marine mammals (minke whales *Balaenoptera acutorostrata*). The Scoping Boundary intersects the MPA (see **Figure 3.1**), which was designated in 2020.
- 3.2.2 The Southern Trench NC MPA takes its name from the 58km long, 9km wide and 250m deep trench running parallel to the coast that was carved out by glaciers. This important geodiversity feature also contains rock features thought to be over 250 million years old. The trench functions as a nursery ground for juvenile fish and the thick, soft mud covering the trench floor is home to an assortment of mud-loving animals. These include the Norway lobster and crabs that build their burrows in the mud, elegant seapens and tube anemones which rise out of the mud to filter food from passing water and squat lobsters on the mud's surface looking for food.
- 3.2.3 The conservation objectives of the site for burrowed mud include: "Conserve the diversity, abundance and distribution of typical species associated within the burrowed mud (including Nephrops norvegicus, Pennatula phosphorea, Virgularia mirabilis, Goneplax rhomboides, Munida spp., Calacaris macandreae, and Callianassa subterranean)" (NatureScot, 2020).
- 3.2.4 The deep trench environment of the Southern Trench NC MPA creates a dynamic mixing zone of warm and cold waters that attracts shoals of herring, mackerel and cod to the area, with the soft sands providing abundant habitat for sandeels (NatureScot, 2020). The presence of these key prey species attracts predator species such as minke whale to the area.
- 3.2.5 The features for which the Southern Trench NC MPA is designated for, the overarching conservation objective, and the feature conditions¹ is presented in **Table 3.1**.

Protected feature(s)	Type of feature	Conservation objectives	Feature condition
Burrowed mud	Habitat	 Maintain in favourable condition. Conserve the current extent and distribution of burrowed mud habitat within the site so that it is stable or increasing; conserve the current physical structure of the burrowed mud; conserve the three-dimensional structure created by fauna and flora (e.g. infaunal burrows created by <i>N. norvegicus</i>) that are associated with this habitat; conserve the functions provided by burrowed mud and the environmental conditions that support them; and 	Favourable (NatureScot, 2020)

Table 3.1 Designated features of the Southern Trench NC MPA (NatureScot, 2020)

¹ 'Feature condition refers to the condition of the protected feature assessed at a site level' (NatureScot, 2020).

Protected feature(s)	Type of feature	Conservation objectives	Feature condition
		• conserve the diversity, abundance and distribution of typical species associated within the burrowed mud (including <i>N. norvegicus</i> , <i>P. phosphorea</i> , <i>V. mirabilis</i> , <i>G. rhomboides</i> , <i>Munida</i> spp., <i>Calacaris macandreae</i> , and <i>C. subterranean</i>).	
Fronts	Large-scale	 Maintain in favourable condition. Conserve the extent, distribution and structure of fronts; conserve the function of the fronts feature so as to ensure that it continues to support its characteristic biological communities and their use of the site including, but not restricted to, feeding, spawning, courtship or use as nursery grounds; and conserve the process which support the front features, in particular current patterns, freshwater input and local topography. 	Favourable (NatureScot, 2020)
Shelf deeps	Large-scale	 Maintain in favourable condition. Conserve the extent, distribution and structure of the shelf deeps feature; conserve the function of the shelf banks and mounds feature so as to ensure that it continues to support its characteristic biological communities (in particular burrowed mud); conserve the process which support the shelf deeps feature, particularly deep-water currents. 	Favourable (NatureScot, 2020)
Minke whale	Mobile species	 Maintain in favourable condition. Minke whale in the Southern Trench MPA are not at significant risk from injury or killing; conserve the access to resources (e.g. for feeding) provided by the MPA for various stages of the minke whale life cycle; conserve the distribution of minke whale within the site by avoiding significant disturbance; conserve the extend and distribution of any supporting feature upon which minke whale is dependent; and conserve the structure and function of supporting features, including processes to 	Favourable (NatureScot, 2020)

Protected feature(s)	Type of feature	Conservation objectives	Feature condition
		ensure minke whale are healthy and not deteriorating.	
Quaternary of Scotland	Geomorphological	 Maintain in favourable condition. Conserve the extent feature's extent, component elements and integrity of the 'Quaternary of Scotland' feature; conserve the structure and functioning of the feature so that they are unimpaired; and conserve the surface of the feature so that it remains sufficiently unobscured for the purposes of determining whether the criteria in conservation objective (a) and (b) (listed above) are satisfied. 	Favourable (NatureScot, 2020)
Submarine mass movement	Geomorphological	 Maintain in favourable condition. Conserve the feature's extent, component elements and integrity of the submarine mass movement feature; conserve the structure and functioning of the feature so that they are unimpaired; and conserve the surface of the feature so that it remains sufficiently unobscured for the purposes of determining whether the criteria in conservation objectives (a) and (b) (listed above) are satisfied. 	Favourable (NatureScot, 2020)

3.3 Turbot Bank NC MPA

- 3.3.1 Turbot Bank NC MPA is located to the southwest of the Fladen Ground in the northern North Sea, 44km east of Peterhead off the east coast of Scotland. The MPA lies within an area of sandy sediment and includes the shelf bank and mound feature known as 'Turbot Bank'. The site covers an area of 251km² and was designated by Marine Scotland as a NC MPA in 2014. The designated features of the Turbot Bank NC MPA; their overarching objectives; and the feature conditions are outline in **Table 3.2**.
- 3.3.2 Turbot Bank is important for sandeels, particularly Raitt's sandeel *Ammodytes marinus*, which is closely associated with sand habitats, living buried in the sand for months at a time. The site contains the type of sandy sediment with low silt and clay components that sandeels prefer. The sandeel species present within Turbot Bank are an important component of the larger sandeel population in the northern North Sea.
| Table 3.2 | Designated features of the Turbot Bank NC MPA (JNC | CC, 2020) |
|-----------|--|-----------|
|-----------|--|-----------|

Protected feature(s)	Type of feature	Conservation objectives	Feature condition
Sandeels	Mobile feature	Maintain in favourable condition. The quality and quantity of its habitats and the composition of its population are such that they ensure that the population is maintained in numbers which enable it to thrive. Any temporary reduction of numbers is to be disregarded if the population of Sandeels is thriving and sufficiently resilient to enable its recovery from such reduction. Any alteration to that feature brought about entirely by natural processes is to be disregarded.	Favourable (JNCC, 2020)

3.4 East Caithness Cliffs NC MPA

- 3.4.1 East Caithness Cliffs NC MPA encompasses nearshore waters off the coast between Wick and Helmsdale, which are used for foraging by over 1,500 breeding black guillemots. The site covers an area of 114km² and was designated by Marine Scotland as a NC MPA in 2014. The designated feature of the East Caithness Cliffs NC MPA, overarching objectives, and the feature conditions are outline in **Table 3.3**.
- 3.4.2 Black guillemots inhabit the rocky crevices and ledges of the sea cliffs adjacent to the MPA. The sandstone cliffs, which rise to 150m at Berriedale have been weathered by the action of the sea to provide ideal nesting conditions for breeding seabirds.

Table 3.3Designated features of the East Caithness Cliffs NC MPA (Nature Scot,2014)

Protected feature(s)	Type of feature	Conservation objectives	Feature condition
Black guillemot	Mobile feature	Conserve the black guillemots within the MPA.	Uncertain (NatureScot, 2014)

4. Summary

- 4.1.1 The NC MPA initial screening has identified the following NC MPAs for the Project:
 - Southern Trench NC MPA;
 - Turbot Bank NC MPA; and
 - East Caithness Cliffs NC MPA.
- 4.1.2 These NC MPA sites and designated features are proposed to be taken forward to the "*main* assessment stage which focuses on determining whether the exercise of a function would or might significantly hinder the achievement of the conservation objectives" (Scottish Government, 2013).
- 4.1.3 The periodic review and monitoring of NC MPAs is undertaken by Marine Scotland. Any revisions to the designated feature definitions and/or conservation objectives for NC MPAs will be monitored by the Project. The timing and content of any revisions will be the subject of stakeholder engagement during the pre-application phase to ensure that the EIA is informed by the most up to date information regarding these sites.

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Ground Conditions and Contamination Assessment Methodology

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1. Introduction

- 1.1.1 The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Scoping and EIA** and specifically in **Section 4.3: Structure of the Environmental Impact Assessment Report**. The approach to assessing effects on the various elements covered in the ground conditions and contamination chapter is described as follows:
 - geology / geodiversity, Section 2;
 - agriculture (agricultural land capability) and soils, from Section 3;
 - land contamination, from **Section 4**; and
 - minerals / minerals safeguarding, from **Section 5**.

2. Geology / Geodiversity

- 2.1.1 The assessment methodology for geodiversity is based upon the DMRB guidance detailed in **Table 6.2.1** in **Section 6.1: Ground conditions and contamination**.
- 2.1.2 The geodiversity assessment focuses on the likely significant effects on geological features of local, national or international importance. The assessment takes into consideration the sensitivity of the affected receptor and the magnitude of change from the baseline conditions resulting from the Project. This results in an evaluation of significance and an indication of likely significant effects. The baseline geodiversity condition is detailed in **paragraph 6.1.30** in **Section 6.1: Ground conditions and contamination** onwards.

2.2 **Receptor sensitivity**

2.2.1 Definitions of receptor sensitivity used in the assessment are provided in **Table 2.1.**

Table 2.1 Sensitivity of receptor / resource

Sensitivity	Criteria / description
Very High	Geodiversity: geology of very rare and of international importance with no potential for replacement (e.g. UNESCO World Heritage Sites, UNESCO Global Geoparks, SSSI's and GCR where citations indicate features of international importance). Geology meeting international designation citation criteria which is not designated as such.
High	Geodiversity: geology of rare and of national importance with little potential for replacement (e.g. geological SSSI, ASSI, National Nature Reserves (NNR)). Geology meeting national designation citation criteria which is not designated as such.
Moderate	Geodiversity: geology of regional importance with limited potential for replacement (e.g. RIGS). Geology meeting regional designation citation criteria which is not designated as such.
Low	Geodiversity: geology of local importance / interest with potential for replacement (e.g. non designated geological exposures, former quarry's / mining sites).
Very low	Geodiversity: no geological exposures, little / no local interest.

2.3 Magnitude of change

2.3.1 Magnitude of change may be either beneficial or adverse. The criteria and examples in **Table 2.2** focus on adverse changes, however, beneficial changes may also occur and will be considered on a case-by-case basis as required.

Table 2.2	Magnitude of	change for	geodiversity
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Magnitude of change	Description example
Very high	Geodiversity: loss of geological feature / designation and/or quality and integrity; severe damage to key characteristics, features or elements
High	Geodiversity: partial loss of geological feature / designation, potentially adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
Medium	Geodiversity: minor measurable change in geological feature / designation attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
Low	Geodiversity: very minor loss or detrimental alteration to one or more characteristics, features or elements of geological feature / designation. Overall integrity of resource not affected.
Very Low	Geodiversity: no temporary or permanent loss / disturbance of characteristics features or elements.

Evaluation of significance

- 2.3.2 During the assessment of effects for each identified receptor the sensitivity value in **Table 2.1** will be combined with the magnitude of change from **Table 2.2** to produce an overall significance rating based on the evaluation matrix shown in **Table 2.3**. A 'significant' effect is assessed as a Moderate or Major rating at this stage of the EIA process. The latter will be subject to further investigation as part of the EIA Report following refinement of design information. This approach will be based on professional judgement and carried out on a precautionary basis.
- 2.3.3 The evaluation of significance for geodiversity will be undertaken using professional judgement, drawing upon information about the nature and extent of the soil resources present, their environmental setting and the type of construction activity proposed.
- 2.3.4 The Project has the potential to result in negative effects on geodiversity during construction where construction activities, such as excavation or vehicle movements, have the potential to result in damage to the geological features, geological features could also be lost by being built upon.

		Magnitude of change					
		Very high High Medium Low Very lov					
	Very high	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	
Sensitivity/importance/value	High	Major (Significant)	Major (Significant)	Major (Significant) Moderate (Potentially significant)		Minor (Not significant)	
	Medium	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	
	Low	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	
	Very low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)	

Table 2.3 Significance evaluation matrix

3. Agriculture (agricultural land capability) and soils

- 3.1.1 The assessment of the likely significant effects for agriculture (agricultural land capability) and soil resources is based on the extent of agricultural land and soil resources that may be affected and whether the effects are temporary or permanent. The assessment is informed by:
 - Information about the construction, operation and decommissioning activities associated with the Project;
 - Relevant national policy, strategy, legislation and guidance documents; and
 - Stakeholder engagement feedback.
- 3.1.2 The assessment takes into consideration the sensitivity of the affected receptor or resource, and the magnitude of change from the baseline conditions resulting from the Project. This results in an evaluation of significance and an indication of likely significant effects.
- 3.1.3 Definitions of receptor sensitivity that will be used in the assessment are provided in **Table 3.1.** The receptor sensitivity assessment approach is designed to take account of key soil functions and ecosystem services, including as a growing medium for crops, as a store of organic matter including carbon, providing habitat and supporting biodiversity, and soil's role in the hydrological cycle. There are many interactions between soil and receptors covered in other sections, including those provided in **Section 6.3: Water resources and flood risk; Section 6.4: Land use; Section 6.5: Terrestrial ecology and ornithology; Section 6.6: Onshore archaeology and cultural heritage; Section 6.9: Landscape and visual; Section 7.2: Socio-economics; Section 7.1: Climate resilience; and, Section 7.3: Greenhouse gases.**
- 3.1.4 The sensitivity applied to soils is based on the most sensitive receptor identified from the criteria in **Table 3.1**.

Table 3.1 Sensitivity of receptor / resource (soil and agricultural land)

Sensitivity	Criteria/description
Very high	LCA Class 1 or 2 agricultural land. Soils directly supporting internationally designated sites or European Sites (e.g. Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar). Peat: nationally important carbon-rich soils (peat soil with >60% organic carbon and >50cm thickness – deep peat), and/or an irreplaceable habitat such as blanket bog or raised bog, with peatland vegetation or peat soil with potential for peatland habitat restoration.
High	LCA Class 3.1 agricultural land. Soils directly supporting a UK designated site (e.g. SSSI, Local Nature Reserves (LNR)). Located within peaty soils (aka organo-mineral soils), peat soil (soil not meeting the description of peat soil [aka deep peat], humose soils (organic-rich mineral soils).
Moderate	LCA Class 3.2 agricultural land. Soils supporting non-statutory designated sites (e.g., Local Wildlife Sites, Ancient Woodland, Open Mosaic Habitat). Mineral soils.

Sensitivity	Criteria/description
Low	LCA Classes 4.1 to 7 agricultural land. Soils supporting non-designated notable or priority habitats, soils on greenfield sites or soils providing notable community/other benefits (e.g., amenity land in urban areas, parks and gardens).
Very low	Other soils, not in agricultural use or providing notable community/other benefits (e.g., badly damaged or contaminated soils, soils on previously developed land, including soils formerly sealed by development).

- 3.1.5 **Table 3.1** assigns the highest sensitivity to soils performing key agricultural functions, organic matter (including carbon) storage/cycling functions, and biodiversity/wildlife supporting functions at an international or national level. Other soil functions include flood risk mitigation, soil's role in filtering surface run-off and regulating aquifer recharge, and the preservation of archaeological remains. Effects on water resources and flood risk receptors, and archaeology, are assessed separately in **6.6: Onshore archaeology and cultural heritage**, and **Section 6.3: Water resources and flood risk**, respectively.
- 3.1.6 Disturbance of soil cannot be avoided by the Project, and soil is vulnerable to damage during handling and storage, even if the effect is only temporary, with some soil types being less resilient to handling than others. For the purposes of the assessment, soil sensitivity will be assessed on a soil function basis. However, it is also acknowledged that during construction, the soil type (e.g., topsoil or subsoil, and specific types of each) and its structural qualities can influence its sensitivity and resilience to structural damage during handling, storage and placement. This level of detail needs to be addressed in soil management planning and will be informed by soil survey and ground investigation. The embedded measures for the Project include development of a Soil Management Plan.
- 3.1.7 Peat has high sensitivity to handling and presents specific issues for storage and reinstatement/reuse. If peat cannot be avoided, specific management measures are needed to protect peat during construction, and to protect site users (e.g., from ground stability issues) and the surrounding environment (e.g., from acidic water runoff). These measures are typically detailed in a Peat Management Plan. The embedded measures for the Project include development of a Peat Management Plan, if peat cannot be avoided.

3.2 Magnitude of change

- 3.2.1 The assessment of the magnitude of change from baseline conditions includes a consideration of the duration and reversibility of the change in the context of relevant legislation, policy standards and guidance. As the soils within the scoping boundary are mainly located on agricultural land and some are likely to constitute prime agricultural land, the approach to the assessment of magnitude of change has been guided by current planning guidance.
- 3.2.2 Soil functions are often inter-related, for example, a healthy agricultural soil capable of performing its biomass function to a high standard should also be capable of other key functions, such as storing flood water and supporting biodiversity, however, compaction of this soil would lead to a reduction in all these functions. **Table 3.2** provides examples of how the magnitude of change is determined with respect to soils and agriculture features.
- 3.2.3 Magnitude of change may be either beneficial or adverse. The criteria and examples in **Table 3.2** focus on adverse changes, however, beneficial changes may also occur and will be considered on a case-by-case basis as required.

Magnitude of change	Description example
Very high	Permanent or long-term temporary (>5 years) loss or significant degradation* of over 80ha of agricultural land or soil.
High	Permanent or long-term temporary (>5 years) loss or significant degradation of between 50ha to 80ha of agricultural land or soil.
Medium	Permanent or long-term temporary (>5 years) loss or significant degradation of between 20ha to 50ha of agricultural land or soil.
Low	Permanent or long-term temporary (>5 years) loss or degradation of up to 20ha of agricultural land or soil or temporary damage over 20ha which will rectify without mitigation.
Very Low	Temporary damage to areas up to 20ha which will rectify without mitigation.

Table 3.2Magnitude of change for agricultural land and soils

*Significant degradation in this context means that a key soil function is significantly reduced, an example could be that agricultural land classification is reduced due to changes in the soil's structure (e.g., due to compaction).

- 3.2.4 The magnitude of change will depend on the amount of land to be affected by the Project. There is no Scottish policy or guidance that defines a quantity of agricultural land loss caused by proposed development that is significant in local or national terms. Average farm size in Scotland is not a useful indicator of what a significant loss of agricultural land might be, as a relatively small number of very large holdings account for a high proportion of the farmed area, and the average farm size is highly skewed as a result (Scottish Government, 2016). In 2018 to 2019 the average size of all farms was around 350ha (Scottish Government, 2020), sheep farms averaged around 1,000ha in size, and other cattle and sheep farms averaged around 700ha, both on less favoured area (LFA) land, which is land where there is a lack of viable alternative enterprise. The assessment in this chapter is concerned with the national stock of agricultural land as a finite resource, and in particular the loss of the most versatile land (i.e., prime agricultural land).
- 3.2.5 In the wider UK context, The Town and Country Planning (Development Management Procedure) (England) Order 2015 only requires Natural England to be consulted on development that involves the loss of greater than 20ha of Grades 1, 2 or 3a agricultural land (defined as 'best and most versatile' land in England, similar to 'prime agricultural land' in Scotland) that is not on an approved development plan. This figure of 20ha equates to a small farm, and 20ha is therefore used in **Table 3.2** as a threshold below which losses are considered to have a small magnitude effect on the national stock of agricultural land. A figure of 80ha of land is used to represent the size of a medium to large farm and loss of land on this scale therefore has a higher impact on the national agricultural land resource.

3.3 Assessment of effects and determining significance

- 3.3.1 During the assessment of effects for each identified receptor the sensitivity value in **Table 3.1** will be combined with the magnitude of change from **Table 3.2** to produce an overall significance rating based on the evaluation matrix shown in **Table 3.1**. A 'significant' effect is assessed as a Moderate or Major. The latter will be subject to further investigation as part of the EIA following refinement of design information. This approach will be based on professional judgement and carried out on a precautionary basis.
- 3.3.2 The evaluation of significance for soils will be undertaken drawing upon information about the nature and extent of the soil resources present, their environmental setting and the type of construction activity proposed.

3.3.3 The evaluation of significance for agricultural land quality will draw upon information about the area of prime agricultural land which might be lost or damaged together with contextual data about the agricultural land, including, but not limited to, prime agricultural land, within the study area.

4. Land contamination

- 4.1.1 The assessment and management of land contamination is usually based on the risk presented by the presence of a hazard (for example, contamination) for a given circumstance, i.e., the probability and consequence of an event occurring. However, EIA seeks to identify the magnitude of a change in status from baseline (impact) caused by the Project and the consequences of those changes (effects).
- 4.1.2 Consequently, for the land contamination assessment, the impact and its effect have been defined as the magnitude of the change in risk from baseline, through construction to post-development conditions.
- 4.1.3 The methodology that is proposed for assessing these risks is set out directly below.

4.2 **Risk Assessment – Land contamination**

- 4.2.1 The process of managing land contamination, as set out in the Environment Agency (2020) guidance LCRM, and as set out in CLR 11, is based on risk assessment. The use of LCRM has been agreed with SEPA. The assessment of risks from contaminated land is based upon the identification and subsequent assessment of a contaminant linkage. A contaminant linkage requires the presence of:
 - a source of contamination;
 - a receptor capable of being adversely affected by the contamination; and
 - an active pathway capable of exposing a receptor to the contaminant.
- 4.2.2 The risk assessment aims to assess the significance of each potential contaminant linkage. The key to the classification is that the designation of risk is based upon the consideration of both of the following.
 - The magnitude of the potential consequence (severity). It takes into account both the potential severity of the hazard and the sensitivity of the receptor.
 - The magnitude of probability (likelihood). It takes into account both the presence of the hazard and receptor and the integrity of the pathway.
- 4.2.3 The definitions for the qualitative risk assessment have been taken from Guidance for the Safe Development of Housing on Land Affected by Contamination Annex 4 (NHBC et al., 2008).
- 4.2.4 The likelihood classifications for the contaminant linkages being realised is presented in **Table 4.1**.

Table 4.1 Likelihood classification of contaminant linkage being realised

Classification	Definition	Exampl	es
High Likelihood	There is a contaminant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution	a) b)	Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden. Ground/groundwater contamination could be present from chemical works, containing a

Classification	Definition	Examples		
			number of Underground Storage Tanks (USTs).	
Likely	There is a contaminant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.	a) b)	Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space. Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.	
Low Likelihood	There is a contaminant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place and is less likely in the shorter term.	a) b)	Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5-1.0m in public open space. Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.	
Unlikely	There is a contaminant linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term.	a) b)	Elevated concentrations of toxic contaminants are present below hardstanding. Light industrial unit <10 years old containing a double skinned UST with annual integrity testing results available.	

4.2.5 The magnitude of the potential consequence of a contaminant linkage gives an indication of the sensitivity of a given receptor to a particular source or contaminant of concern under consideration. It is based on full exposure via the linkage being examined. The classification of consequence is presented in **Table 4.2**.

Table 4.2 Classification of consequence

Classification	Human Health	Controlled Water	Geodiversity	Property / Structures/ Crops and animals	Examples
Severe	Highly elevated concentrations likely to result in "significant harm" to human health as defined by the Environmental Protection Act (EPA) 1990, Part 2A, if exposure occurs.	Equivalent to Environment Agency Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.	Major damage to a geodiversity site, which is likely to result in a substantial adverse change in its functioning or harm to a site of special interest that endangers the long-term maintenance of the site.	Catastrophic damage to crops, buildings or property.	 Significant harm to humans is defined in the Contaminated Land Statutory Guidance as death, life threatening diseases (for example, cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated concentrations of Hazardous or priority substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).
Medium	Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part	Equivalent to Environment Agency Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.	Significant damage to a geodiversity site, which may result in a substantial adverse change in its functioning or harm to a site of special interest that may endanger the long- term maintenance of the site.	Significant damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance as death, life threatening diseases (for example, cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions.

Classification	Human Health	Controlled Water	Geodiversity	Property / Structures/ Crops and animals	Examples
	2A if exposure occurs.				Damage to building rendering it unsafe to occupy, for example, foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes.
Mild	Exposure to human health unlikely to lead to "significant harm".	Equivalent to Environment Agency Category 3 pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture or commerce.	Minor or short-lived damage to a geodiversity site, which is unlikely to result in a substantial adverse change in its functioning or harm to a site of special interest that would endanger the long- term maintenance of the site.	Minor damage to crops, buildings or property.	Exposure could lead to slight short-term effects (for example, mild skin rash). Surface spalling of concrete.
Minor	No measurable effects on humans	Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.	Equivalent to insubstantial pollution incident with no observed effect on a geodiversity site or site of special interest.	Repairable effects of damage to buildings, structures	The loss of plants in a landscaping scheme. Discoloration of concrete.

4.2.6 The risk matrix to link the likelihood and consequence is shown in **Table 4.3**.

Likelihood Potential Consequence	Unlikely	Low	Likely	High
Severe	Moderate/Low Risk	Moderate Risk	High Risk	Very High Risk
Medium	Low Risk	Moderate/Low Risk	Moderate Risk	High Risk
Mild	Very Low Risk	Low Risk	Moderate/Low Risk	Moderate Risk
Minor	Very Low Risk	Very Low Risk	Low Risk	Low Risk

Table 4.3Risk matrix

4.2.7 The overall risk definitions are summarised in **Table 4.4**.

Table 4.4 Risk definitions

Risk	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very Low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

4.3 Significance evaluation methodology

- 4.3.1 To use risk assessment as the basis for the evaluation of the significance of effects, it is necessary to evaluate the change in risk from baseline conditions to those during and following the Project. In order to define the baseline risk the initial assessment and classification of risk is carried out for the study area in its pre-development state. A separate assessment of risk is then conducted for the site post-development (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Project.
- 4.3.2 **Table 4.5** uses the risk classification pre- and post-development as the basis for a significance evaluation matrix for the purposes of EIA.
- 4.3.3 The magnitude of the potential consequence of a contaminant linkage gives an indication of the sensitivity of a given receptor to a particular source or contaminant of concern under consideration. It is based on full exposure via the linkage being examined. The classification of consequence is presented in **Table 4.2**.

Table 4.5 Land contamination effects significance evaluation matrix

			Risk Post-development (including embedded environmental measures)										
			Very Low	Low	Moderate / Low	Moderate	High	Very High					
	Existing Receptors						Very High	Major Positive (Significant)	Major Positive (Significant)	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)
opment		High	Major Positive (Significant)	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)					
					Moderate	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)		
		Moderate / Low	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant) Moderate Negative (Potentially Significant) Major Negative (Significant)	Moderate Negative (Potentially Significant)					
		Low	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)		Major Negative (Significant)					
		Very Low	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)		Major Negative (Significant)					
Risk Pre-devel	No Receptor Present Pre- development	N/A	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)	Major Negative (Significant)					
	Risks that remain at moderate, high, or very high post-development are unlikely to be considered acceptable and further environmental measures will be required to enable the development to proceed.												

5. Minerals / Minerals Safeguarding

- 5.1.1 There is no established methodology for assessing the environmental effects of a development on minerals or mineral safeguarding. The methodology used in this assessment has, therefore, been developed based on the generic approach guidance detailed in **Chapter 4: Approach to Scoping and EIA**.
- 5.1.2 For the minerals assessment, the methodology is based on the proximity of the Project to identified minerals resources, as identified by Aberdeenshire Council (see **Table 6.1.4** in **Section 6.1: Ground conditions and contamination**) and the impact that the Project would have on the ability to extract economically viable resources. The effect is determined by considering the sensitivity of the minerals resources, based on the likelihood of extraction occurring, and the magnitude of change from the level of impact that the Project will have.
- 5.1.3 A summary of the receptor sensitivity criteria is presented in **Table 5.1** and the criteria for evaluation of magnitude of effects is summarised in **Table 5.2**.

Sensitivity	Planning Designation
High	Existing minerals sites. Allocated minerals sites.
Medium	Minerals safeguarding areas. Minerals/minerals areas of search.
Low	No mineral resources identified.
Negligible	No mineral resources identified.
Low Negligible	No mineral resources identified. No mineral resources identified.

Table 5.1 Sensitivity criteria for minerals / minerals safeguarding

Table 5.2 Evaluation of magnitude of effects for minerals safeguarding

Magnitude	Criteria
High	Development permanently prevents viable exploitation of a resource. Development directly and negatively affects the operation of an ongoing mineral extraction site to the extent that its viability is clearly and demonstrably reduced.
Medium	Development has permanent effects that will sterilise a significant proportion of a mineral deposit (excluding those under ongoing extraction). Development has temporary effects that sterilise a significant proportion of a mineral deposit (excluding those under ongoing extraction) but which would be expected to be reversed in the short to medium term.
Low	Development permanently affects a minor proportion of a mineral deposit, to an extent that is unlikely to significantly affect its overall viability or quality. Development has temporary effects that sterilise minor parts of a mineral deposit (excluding those under ongoing extraction), which would be expected to be reversed in the short to medium term,
Negligible	Development has no permanent or temporary effects on mineral deposits that would affect the ability to extract the deposits, their viability or their quality.

5.1.4 **Table 5.3** combines the sensitivity and magnitude of minerals safeguarding effects as the basis for a significance evaluation matrix for the purposes of EIA.

Table 5.3 Minerals safeguarding significance evaluation matrix

Magnitude Sensitivity	Negligible	Low	Medium	High
High	Minor	Moderate	Major (significant)	Major (significant)
Medium	Negligible	Minor	Moderate	Major (significant)
Low	Negligible	Negligible	Minor	Moderate
Negligible	Negligible	Negligible	Negligible	Minor

6. References

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The Town and Country Planning (Development Management Procedure) (England) Order 2015. [online] Available at: <u>https://www.legislation.gov.uk/uksi/2015/595/contents/made</u> [Accessed 4 October 2022]. **Appendix 6.5A:**

Winter Geese Survey Method and Rationale

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1. Introduction

Wintering geese distribution surveys of functionally-linked land around the Loch of Strathbeg SPA

- 1.1.1 The following report sets out the requirement for survey and the methodology associated with onshore wintering geese surveys associated with the Project to be undertaken this autumn/winter season (2022/23) (Section 6.5: Terrestrial Ecology & Ornithology: Table 6.5.3: Consultation; and Table 6.5.7: Field survey programme).
- 1.1.2 The approach to optioneering for onshore infrastructure associated with the Project considers a number of potential landfall site options within the Scoping Boundary area. There is potential for works associated with these landfall options, substation and associated onshore export cable corridors to impact pink-footed geese (and potentially other geese and swans) associated with the Loch of Strathbeg Special Protection Area (SPA) and Ramsar site, which are known to utilise farmland within the wider environs of the SPA. Consequently, there is a requirement to undertake a programme of onshore ornithological surveys during the non-breeding season in order to understand the distribution and likely sensitivity associated with any future proposals. Surveys focus on land identified as 'functionally linked' i.e. where SPA species utilise non-designated habitats within the wider vicinity of the European site.
- 1.1.3 Survey proposals are based on a study area within the Scoping Boundary (see **Figure 1.1**: **Scoping Boundary** in **Appendix 1A**) that provides coverage for all potential landfall site options and wider onshore export cable corridors considered to have 'functional linkage' with the Loch of Strathbeg SPA. The study area follows the same survey study area covered by previous survey of feeding distribution of pink-footed geese around the Loch of Strathbeg (Littlewood and Sideris, 2016). The spatial aspects of this survey methodology will be revised for year 2 surveys as required, in line with the optioneering process as the landfall zones are refined.





2. Methodology

- 2.1.1 Baseline data collection and a review of literature will be undertaken to obtain information within the proposed onshore study area. Data sources will include:
 - NatureScot Sitelink (at <u>https://sitelink.nature.scot/home</u>);
 - North East Scotland Biodiversity Record Centre (NESBReC), the North East Scotland Scottish Ornithologists' Club (SOC) Bird Recorder, and other relevant bodies;
 - British Trust for Ornithology (BTO) Non-Estuarine Waterbird Surveys (NEWS) and Wetland Bird Survey (WeBS) data;
 - Royal Society for Protection of Birds (RSPB) data specific to the Loch of Strathbeg;
 - Scottish Bird Reports <u>https://www.the-soc.org.uk/about-us/online-scottish-bird-report;</u>
 - North East Scotland Bird Reports;
 - RSPB for provision of goose counts made on the Loch of Strathbeg reserve;
 - Scottish Natural Heritage (SNH,2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, March 2017 Version 2;
 - Littlewood, N.A. and Sideris, K. 2016. A survey of the feeding distribution of geese around the Loch of Strathbeg. Scottish Natural Heritage Commissioned Report No. 937; and
 - Patterson, I.J. 2015. Goose flight activity in relation to distance from SPAs in Scotland, including an analysis of flight height distribution. Scottish Natural Heritage Commissioned Report No. 735.

3. Consultation

3.1.1 Consultation has been undertaken with NatureScot and RSPB in order to outline the scope of survey methodology and coverage (at a high level). Further consultation is anticipated on completion of the ongoing survey programme and following completion of the optioneering process. Liaison with the RSPB at Loch of Strathbeg reserve will also be undertaken regarding the provision of goose count data from the Loch of Strathbeg in Quarter 2 2023.

4. Distribution survey

- 4.1.1 Northeastern Aberdeenshire is an important non-breeding area for geese, of which the overwhelming majority are pink-footed geese (*Anser brachyrhynchus*). Most geese using northeastern Aberdeenshire roost overnight at the Loch of Strathbeg SPA and RSPB reserve, which is one of the main roost sites in the UK and has previously supported over 60,000 geese. The main roost is at the loch, and the geese feed during the day (and on moonlit nights) in surrounding fields.
- 4.1.2 Surveys follow the approach to those outlined by Littlewood and Sideris (2016), which aligns with SNH (2017) wintering geese distribution survey guidance. The key objective is to survey the feeding distribution of geese which roost at the Loch of Strathbeg, in order to identify the areas within the Scoping Boundary which are most heavily used by the geese.
- 4.1.3 Fieldwork will be undertaken two days a month between September 2022 and April 2023, and follows a fortnightly programme for each of these two monthly surveys.
- 4.1.4 Fieldwork would be planned for days on which the weather is suitable for making observations and not likely to abnormally influence geese distribution around the site. This is regarded as being days when the wind is forecast to be no stronger than Beaufort force 5, with rain not exceeding short showers and with good visibility.
- 4.1.5 The survey method would follow Littlewood and Sideris (2016), which involves driving most of the roads within the study area, noting the presence and size of geese flocks. Most pinkfooted geese in North-East Scotland forage within 20km of their roost site (Patterson, 2013) and the study area is designed to encompass all likely areas where the majority of the geese that roost at Loch of Strathbeg may feed.
- 4.1.6 As illustrated in **Figure 1.1**, the purple line shows the outer boundary of the field survey study area, within the context of the wider Scoping Boundary area.
 - The study area shows, with black lines, the network of roads to be driven during the distribution survey.
 - The location of 6x vantage points used for supplementary flight activity surveys.
 - The 3km radius survey area is shown in each case.
- 4.1.7 Following Littlewood & Sideris (2016) (and informed by SNH (2017) guidance), the starting point and direction of the distribution survey route will be varied randomly for each survey visit, to reduce systematic bias relating to the time of day when each part of the area is visited. Fieldwork will be timed to avoid the main times where geese are flying to and from roost and thus to avoid the first and last two hours of daylight.
- 4.1.8 Whilst driving the route, if geese are noted, they will be observed from the roadside where safe to do so. Suitable vantage positions that provide clear views across large areas will be used to scan more distantly, with a telescope where appropriate.
- 4.1.9 When geese on the ground are found, their identification will be noted and the location of the centre of the flock determined from a 1:25,000 map. The number of geese of each species in each flock will be counted or estimated. If there are areas within a flock that are not visible from the road, the geese will be watched for a few minutes to make a judgement based on birds moving in and out of view.

4.1.10 The field type will be noted in one of the following categories: grass, stubble, ploughed, winter cereal and other arable crop. It is not proposed that bird activity be noted within a field, so although most birds may be feeding when found, this may not necessarily be the case for all flocks noted. Whilst carrying out these surveys, swans (potentially associated with the SPA) seen on land will also be noted.

5. Flight activity survey

- 5.1.1 Distribution surveys will also be supplemented with flight activity survey data, following the approach adopted by Littlewood and Sideris (2016). At this stage in the optioneering process, given the size of the study area and as yet undefined landfall, route corridor and substation locations, targeted focal vantage point surveys (following onshore wind farm survey guidance (SNH, 2017)) are not proposed. The emphasis for this study is not on movements to and from the Loch of Strathbeg roost site, rather these surveys provide supplementary data in terms of picking up any diurnal movements between foraging areas and maximising the opportunity for data capture during each survey visit, where the data coverage provided by the driven transects is the core element.
- 5.1.2 Six vantage points are being adopted, as used by the Littlewood & Sideris (2016) study. These correspond to current goose management scheme boundaries. The precise positions of vantage points were selected so as to allow clear views over as wide an area as possible and to permit convenient and safe parking at the location or close by.
- 5.1.3 At each vantage point, a watch will be conducted for one hour once during each fortnightly survey. All geese seen through 360° out to 3km distance will be noted. Geese will initially be located either by sight or sound and a full scan of more distant parts of the watch area, using binoculars, and conducted at around five-minute intervals. The order in which each of the three vantage point watches are conducted in a day will be varied each month.
- 5.1.4 When geese are noted, the time, species, flock size (estimated if necessary), direction of flight and direction and distance from observer will be noted. Flight height will also be noted. For closer flocks (up to about 500m distance) this will be assessed, when possible, using a laser rangefinder (model Hawke LRF 900), set to measure vertical distance above the observation position. Measurements made with the laser rangefinder will be used to guide estimates of flight height for other flocks. A note will also be made of whether the height was estimated or measured with the laser rangefinder.
- 5.1.5 Any disturbance events that cause birds to take flight, or have a reasonable potential to do so, will also be noted.
- 5.1.6 The numbers of geese in flight per area, per time period (e.g. similar to that described by Littlewood and Sideris (2016)) will be the primary metric being assessed. The survey is very much a sampling exercise, rather than a detailed assessment of geese movements across the whole area.

6. Avian Influenza

- 6.1.1 The Scottish Government website provides the latest situation including current outbreaks and measures in place to prevent the spread of Highly pathogenic avian influenza (HPAI) H5N1 (bird flu). Bird flu has been confirmed in Scotland and in other parts of the UK. Restrictions and prevention measures are in place. There are no current disease control zones in Aberdeenshire.
- 6.1.2 The United Kingdom dead wild bird surveillance programme has identified findings of bird flu in a variety of wild bird species. Positive wild bird findings have been identified in Aberdeenshire.
- 6.1.3 Surveyors will avoid touching sick or dead wild birds. If the following are found at the same place at the same time, the Project will report finds directly to Department of Environment, Food and Rural Affairs (Defra) on 03459 33 55 77 (as well as RSPB and NatureScot taskforce at the earliest opportunity):
 - a single dead bird of prey;
 - three dead gulls or wild waterfowl (swans, geese or ducks); or
 - five or more dead wild birds of any other species.

7. Analysis

- 7.1.1 For the distribution survey, the grid references of geese flocks (all species combined) will be entered into QGIS software which would be used, along with open-source background maps, to generate maps of goose abundance. Kernel analysis will be undertaken to determine which areas were most heavily occupied by geese using the Heatmap tool within QGIS. The radius for the analysis is 500m and the analysis will be carried out by weighting the points based on the number of birds at each point. The data will be analysed to display trends through the survey period.
- 7.1.2 Data will also be analysed to determine the proportion of birds recorded in each field type.
- 7.1.3 For the flight survey, geese flocks will be assigned to a 1km square based on the bearing from observer and estimated distance. Figures will be calculated for geese seen in each 1km square that was at least partly within a 3km radius.

8. Rationale for Further Surveys

- 8.1.1 As the Project onshore infrastructure optioneering work is progressed, based on surveys undertaken this autumn/winter season (2022/2023), if the preferred landfall and onshore export cable route options are likely to be sited beyond a 2km zone of influence (ZOI) from the Loch of Strathbeg roost site then the data will be reviewed to determine the requirement for further survey effort over a second winter over the 2023/2024 autumn/winter season. However, if the preferred options are to be located within a precautionary 2km ZOI from the Loch of Strathbeg roost site, then focal VP surveys (as well as a second year of driven transect distribution surveys) are proposed to be undertaken in 2023/2024 as per the specifications outlined within the SNH (2017) guidance.
- 8.1.2 Further engagement with stakeholders (NatureScot and RSPB) will be undertaken on completion of the winter 2022/23 survey programme and as further optioneering work progresses.

9. References

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Appendix 6.9A: LVIA Methodology

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1. Introduction

- 1.1.1 The project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Scoping and EIA**. This appendix describes the proposed methodology for the landscape and visual impact assessment (LVIA) for the onshore elements of the Project, as well as offshore elements that may result in onshore landscape and visual effects.
- 1.1.2 The methodology, presented here as part of the scoping process, may be subject to change as a result of consultation and further development of the assessment process.
- 1.1.3 This appendix has been structured as follows:
 - overview of LVIA methodology;
 - iterative assessment and design;
 - guidance, data sources and site surveys;
 - assessing landscape effects;
 - assessing visual effects;
 - assessing cumulative landscape and visual effects;
 - evaluation of significance;
 - nature of effect; and
 - visual representations.

2. Overview of the LVIA methodology

- 2.1.1 The assessment will be undertaken in accordance with the Landscape Institute and IEMA (2013) *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition (GLVIA3), and other best practice guidance. An overview of the LVIA process is illustrated in **Plate 2.1**.
- 2.1.2 The LVIA will assess the likely effects of the onshore elements of the Project on the landscape and visual resource, encompassing effects on landscape elements, characteristics and landscape character, designated landscapes, visual effects and cumulative effects.
- 2.1.3 Essentially, the landscape and visual effects (and whether they are significant) is determined by an assessment of the nature or 'sensitivity' of each receptor or group of receptors and the nature of the effect or 'magnitude of change' that would result from the onshore elements of the Project. The evaluation of sensitivity takes account of the value and susceptibility of the receptor to the onshore elements of the Project. This is combined with an assessment of the magnitude of change which takes account of the size and scale of the proposed change, the geographical extent and the duration of that change. By combining assessments of sensitivity and magnitude of change, a level of landscape or visual effect can be evaluated and determined. The resulting level of effect is described in terms of whether it is significant or not significant and the type of effect is described as either direct or indirect; temporary or permanent (reversible); cumulative; and beneficial, neutral or adverse.

Plate 2.1 Overview of approach to landscape and visual impact assessment



- 2.1.4 The assessment also considers the whole project or combined effects of the offshore and onshore elements of the Project, as well as the cumulative effects likely to result from the Project and other similar proposed developments.
- 2.1.5 In each case an appropriate and proportionate level of assessment has been undertaken and agreed through consultation at the scoping stage. The level of assessment may be 'simple' (requiring desk-based data analysis) or 'detailed' (requiring site surveys and investigations in addition to desk-based analysis). Due to the nature of landscape and visual assessment, the LVIA will be subject to detailed assessment with only the operation / maintenance of the underground cable and landfall elements of the onshore Project scoped out. The landscape and visual assessment unavoidably involves a combination of quantitative and qualitative assessment and—wherever possible—a consensus of

professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

2.2 Interface between seascape and landscape assessment

Introduction

- 2.2.1 Together, the LVIA and the Seascape, Landscape and Visual Impact Assessment (SLVIA) provide a whole project assessment of the effects of the Marram Offshore Wind Farm (the Project). The offshore elements of the Project (the wind farm, offshore platforms and offshore export cable corridor) are assessed in the SLVIA and the onshore elements of the Project (the onshore substation, onshore cable corridor, and landfall location) are assessed in the LVIA. Both the SLVIA and the LVIA follow a broadly similar assessment methodology that uses the same glossary and terminology.
- 2.2.2 The LVIA will refer to potential interrelated effects likely to result from any areas where the construction, operation / maintenance and decommissioning of the offshore and onshore elements combine, or inter-relate to affect receptors within the LVIA study area. An example could include effects on views where both offshore and onshore elements are visible, potentially resulting in whole project landscape and visual effects as a result of the construction, operation / maintenance and decommissioning of the onshore and offshore elements. In those instances, where there is overlap between the onshore and offshore effects, the LVIA will provide whole project assessment focusing on the onshore development that will be referenced for consistency in the SLVIA. The SLVIA will also provide a whole project assessment focusing on the offshore development.

Assessment of the foreshore

- 2.2.3 Scottish Natural Heritage (2017a) Guidance note: Coastal Character Assessment predates Scotland national landscape character assessment (NatureScot, 2019) but advises that "existing suite of landscape character assessment studies, covering all of Scotland, provides information on coastal character but this varies according to the local authority area. While some of these studies will provide useful background when considering coastal character, the boundaries and scales of landscape character types and areas are unlikely to correlate precisely with those defined for coastal character. This is because although the character of the coast is influenced by the immediate hinterland, it is often different in its articulation and scale. This can occur, for instance, where the coastal edge is fragmented and indented but is backed by a relatively simple landscape of moorland or pasture."
- 2.2.4 The national landscape character assessment is also varied in its approach to the coastline / foreshore according to the specific character of the landscape and it is therefore accepted that there will be a degree of overlap (within the foreshore area) between landscape and seascape character assessments for the study area. NatureScot advise in this respect that "Some flexibility is necessary in defining the extent of the coast and the assessor will need to consider this on a case-by-case basis. This is principally influenced by the dominance of the sea in terms of physical characteristics, views and experience. The landward extent of the coast can be narrow where edged by cliffs or settlement; or broad where it includes raised beaches, dunes or more open coastal pasture or machair. The seaward extent can also vary considerably depending on the span of water, degree of containment by land and the nature of views to open sea. The strong inter-relationship of land and sea in Scotland will also necessitate exploration of the wider coastal context and of the interaction between sea, islands and land." (NatureScot, 2019, page 4).

- 2.2.5 It should be noted that the limit of the s36 / marine licence extends from the sea to the Mean High Water Springs (MHWS) and the landward limit of the TCPA application in Scotland extends to Mean Low Water Springs (MLWS) which also entails a degree of overlap along the foreshore (between the MHWS and the MLWS). The landscape character assessment and the coastal or seascape character assessments undertaken as part of the LVIA / SLVIA will therefore need to clearly describe which receptor is being assessed.
- 2.2.6 This approach means that the 'foreshore', which includes beaches, inter-tidal areas and coastlines between the MLWS and the MHWS, will be considered in both the landscape and seascape character assessments, allowing for a flexible degree of overlap according to the particular landscape or seascape character. This ensures adequate consideration will be given to assessing the relationship between terrestrial and marine areas and interactions across the land/sea interface.
- 2.2.7 In the absence of any local seascape assessment it may also be necessary to develop a seascape / coastal character assessment of the areas within the Scoping Boundary or study areas and agree this with consultees.

2.3 **Defining the study area**

- 2.3.1 The study area for the LVIA is yet to be confirmed and is currently subject to the wider Scoping Boundary illustrated in **Figure 6.9.1: LVIA study area** in **Appendix 1A**. It is likely that the study area will extend to a 2-5km buffer from the Project and is likely to be supported by a small number of elevated, long-distance panoramic viewpoint locations within the wider landscape. The extent of the study area will be informed by further desk based and site survey analysis.
- 2.3.2 IEMA Guidance (IEMA, 2015 and 2017) recommends a proportionate assessment, focused on the likely significant effects of a development. The LVIA study area must therefore be large enough to capture all likely significant effects. However, an overly large LVIA study area may be considered disproportionate if it makes understanding the key impacts of the development more difficult by including extraneous baseline information, and hence receptors which are unlikely to be significantly affected by the Project.
- 2.3.3 This is supported by the Landscape Institute (GLVIA3) (Landscape Institute, 2013) (para 3.16) which recommends that '*The level of detail provided should be that which is reasonably required to assess the likely significant effects*'. Para 5.2 also states that '*The study area should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner*'.
- 2.3.4 The study area therefore is based on professional judgement which aims to include those areas which are potentially and likely to be significantly affected by the onshore elements of the Project. This judgement is based on our early understanding of the local landscape character and the scale of the construction and development proposed within the Scoping Boundary as well as a review of study areas used for similar offshore wind farm developments.
- 2.3.5 The study area will be reviewed and amended in response to the maturing design and assessment process and where appropriate responses to consultation. This will result in the confirmation of an onshore LVIA study area that will be the focus of the onshore LVIA.

3.1 Introduction

- 3.1.1 The LVIA is part of an iterative EIA process which aims to 'design out' significant effects via a range of design and environmental measures including avoidance of effects through the site selection process and subsequent use of landscape design techniques to reduce or eliminate significant effects. Design is an integrated part of the LVIA process and environmental measures related to landscape design and management can be an important tool to mitigate significant effects as well as providing enhancement.
- 3.1.2 In addition to the EIA process, Schedule 9 of the Electricity Act (1989) includes duties to preserve the natural beauty of the countryside and provide reasonable mitigation.
- 3.1.3 The EIA process can also call on a range of environmental and technical specialists that contribute other forms of mitigation that may also bring a range of benefits to the Project. Potentially significant landscape and visual effects and the constraints and opportunities connected with their resolution are identified through the LVIA process. Where possible, mitigation such as design modification or landscape planting schemes are incorporated into the onshore elements of the Project to mitigate landscape and visual effects these are termed 'embedded environmental measures'.
- 3.1.4 Embedded mitigation will be recorded and an explanation will be provided of how the measures will be secured as well as documenting the design evolution of the onshore elements of the Project.

Site Selection

3.1.5 Site selection is a key component of the design and environmental measures process and includes the use of baseline landscape and visual data and site / field surveys in order to inform corridor and site selection through the application of relevant design guidance such as the National Grid's (2009) Horlock Rules for substation site selection. The design measures will consider the potential to reduce overall landscape and visual effects as well as the use of other landscape design techniques that be used during construction and operation / maintenance.

3.2 **Potential effects during construction**

- 3.2.1 A range of potential effects on the landscape and visual resource are likely during the construction of the onshore elements of the Project. This appraisal of the potential effects helps define the scope and nature of the LVIA methodology. The potential effects likely to result from construction are described below.
 - Landscape effects:
 - Effects on landscape elements, features and patterns (including, but not limited to soils, landform, ground vegetation, hedgerows/field boundaries, trees, woodland and buildings) as a result of land preparation including site clearance and earthworks.
 - ► Effects on landscape character and key characteristics, including perceptual characteristics and qualities as a result of construction activities. The construction activities are likely to include the presence of construction staff and machinery, cranes, vehicle movements, contractors' facilities and site access associated with the onshore substation and cable corridor. Landscape works to implement the

landscape design strategy for the onshore substation and reinstatement works along the cable corridor will also need to be accounted for in the assessment.

- Effects on the special landscape qualities and integrity of designated landscapes as a result of the above construction activities.
- Visual effects:
 - Effects on the views and visual amenity experienced by people undertaking various activities at various locations, distances and directions from the proposed land preparation and construction activities. These visual effects could be experienced from one location or sequentially as part of a route through the landscape such as a Core Path.
- Whole-project effects:
 - Whole project effects could occur as a result of multiple construction activities related to the onshore and/or the offshore elements of the Project collectively affecting a landscape or visual receptor.
 - Whole project effects could also result from the construction phasing of the onshore elements of the Project and influence the nature and type of effect. For example, construction works on the onshore export cable corridor are likely to occur sequentially, resulting in relatively short bursts of construction activity and reinstatement occurring at different locations along the cable corridor. Construction activity at the landfall and/or substation may also be programmed to occur sequentially or concurrently with other onshore elements of the Project.

3.3 Potential effects during operation / maintenance

- 3.3.1 The potential effects during operation / maintenance relate principally to the presence of the onshore substation, its on-going maintenance and the establishment of planting associated with the landscape design strategy, which forms part of the embedded environmental measures to mitigate significant landscape and visual effects.
- 3.3.2 The operational period of the onshore substation(s) is likely to result in a long-term (reversable) effect on landscape and visual receptors. These effects would be partly and increasingly mitigated by the implementation and establishment of the landscape design strategy which will typically be assessed during Years one to five (implementation and establishment) and typically Years five to 15 to allow for the growth of vegetation and the prediction of any alteration to the operational effects on landscape and visual receptors. The periods of assessment will be agreed with consultees.

3.4 **Potential effects during decommissioning**

3.4.1 The onshore substation would be decommissioned. This would lead in principle to a reversal of the landscape and visual effects.

4. Guidance data sources and site surveys

4.1 Guidance on methodology

- 4.1.1 This methodology accords with the guidance set out in the GLVIA3. Where it clarifies or diverges from specific aspects of the guidance, in a small number of areas, reasoned professional justification for this is provided as follows.
 - GLVIA3 sets out an approach to the assessment of magnitude of change in which three separate considerations are combined within the magnitude of change rating. These are the size or scale of the effect, its geographical extent and its duration and reversibility. This approach is to be applied in respect of both landscape and visual receptors. The Applicant considers that the process of combining all three considerations in one rating can distort the aim of identifying significant effects of the Project. For example, a high magnitude of change, based on size or scale, may be reduced to a lower rating if it occurred in a localised geographical area and for a short duration. This might mean that a potentially significant effect could be overlooked if due to their limited geographical extents and / or short duration or reversibility.
 - The Applicant has chosen to ensure that the description of the assessment of magnitude is therefore clearly explained and decisions regarding the weight to be given to the size or scale of the effect, its geographical extent and its duration and reversibility are fully explained in turn, starting with the size or scale, the geographical extents of the effects, and their duration and reversibility separately. A conclusion is then provided on the overall level of effect by combining with other judgements on sensitivity, to allow a final judgement to be made on whether an effect is significant or not significant.
 - The assessment methodology utilises six word scales to describe the magnitude of change – high, medium-high, medium, medium-low, low and negligible-zero; which are preferred to the 'maximum of five categories' suggested in GLVIA3 (3.27), as a means of clearly defining and summarising magnitude of change judgements.

4.2 Data sources

4.2.1 A list of the data sources used for this assessment is provided in **Section 6.9: Landscape and Visual** of the Scoping Report.

4.3 Desk-based and site survey work

- 4.3.1 A preliminary desk-based assessment will be undertaken of landscape and visual receptors using a range of map based data and related computer and digital analysis including Zone of Theoretical Visibility (ZTV), digital and/or surface terrain modelling and wireframe and street view software. This information will be used to inform initial assessments and focus the site survey work and likely locations for viewpoint photography and sequential route assessment.
- 4.3.2 A series of site surveys will be undertaken to verify the initial desk-based assessments which may only require simple assessment techniques to complete. This may be due to receptors falling outside the ZTV or confirmation of screening from vegetation and/or built form that means there would be no view of the onshore elements of the Project.

- 4.3.3 Site surveys (referring to the Project) and field surveys (referring to the wider LVIA study area) are likely to include the following.
 - Site survey verification of landscape elements within the onshore substation site and cable corridor and recommendations for embedded environmental measures where potentially significant effects are identified.
 - Field survey verification of the ZTV from landscape and visual receptor locations and transport and recreational routes through the LVIA study area.
 - Micro-siting of viewpoint locations and recording of panoramic baseline photography and subsequent visual assessment from the assessment viewpoints.
 - Identification of interactions between onshore and offshore elements of the Project such as whole project visibility or landscape and seascape effects.
- 4.3.4 The viewpoint photography and visual assessment surveys are planned during 2023. Further visual assessment verification surveys are then likely to be undertaken prior to the application, using visualisations for each relevant viewpoint or particular receptor location.
- 4.3.5 All site survey work will be undertaken in fair weather conditions with good to excellent visibility.

5. Assessing landscape effects

5.1 Introduction

5.1.1 Landscape Effects are defined by the Landscape Institute in GLVIA 3, paragraphs 5.1 and 5.2 as follows:

"An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character."

5.1.2 In accordance with GLVIA 3 the term 'landscape' encompasses areas of 'townscape' and coastal areas of 'seascape'. In this assessment, the term 'landscape' is used to describe landscape and seascape unless otherwise noted. Areas of landscape and seascape are relevant to this assessment and they are described as follows:

5.2 Landscape character

- 5.2.1 GLVIA 3, paragraph 5.4, advises that Landscape Character Assessment should be regarded as the main source for baseline studies and identifies the following factors which combine to create areas of distinct landscape character:
 - "the elements that make up the landscape in the study area including:
 - physical influences geology, soils, landform, drainage and water bodies;
 - landcover, including different types of vegetation and patterns and types of tree cover; and
 - the influence of human activity, including land use and management, the character of settlements and buildings, and pattern and type of fields and enclosure.
 - The aesthetic and perceptual aspects of the landscape such as, for example, its scale, complexity, openness, tranquillity or wildness;
 - The overall character of the landscape in the study area, including any distinctive Landscape Character Types or Areas that can be identified, and the particular combinations of elements and aesthetic and perceptual aspects that make each distinctive, usually by identification as key characteristics of the landscape."

5.3 Seascape character

- 5.3.1 GLVIA 3 paragraph 5.6, advises that where LVIA is carried out in coastal or marine locations baseline studies must take account of seascape. Seascape is defined in the UK Marine Policy Statement, (HM Government, Northern Ireland Executive, Scottish Government and Welsh Assembly Government, March 2011) as "*landscapes with views of the* coast *or seas*, *and coasts and the adjacent marine environment with cultural*, *historical and archaeological links with each other*."
- 5.3.2 GLVIA 3 paragraph 5.6, identifies the following different factors which together determine seascape character:
 - "coastal features;
 - views to and from the sea;

- particular qualities of the open sea;
- the importance of dynamic changes due to weather and tides;
- changes in seascapes due to coastal processes;
- cultural associations; and
- contributions of coastal features to orientation and navigation at sea."

5.4 Landscape effects

- 5.4.1 The potential landscape effects, occurring during the construction, operation / maintenance and decommissioning periods of the Project may therefore include, but are not restricted to the following.
 - changes to landscape elements: the addition of new elements (onshore substation, landfall and cable corridor) or the removal of existing elements such as trees, vegetation and buildings and other characteristic elements or valued features of the landscape character;
 - changes to landscape qualities: degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of the landscape character or contribute to the landscape value;
 - changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within a particular area;
 - changes to designated landscapes, including the Special Landscape Areas (SLA) that would affect the special landscape qualities underpinning the designation and its integrity; and
 - cumulative landscape effects: where more than one development of a similar type may lead to a cumulative landscape effect.
- 5.4.2 Development may have a direct effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, outside the immediate site area and its associated landscape character.

5.5 Evaluating landscape sensitivity to change

- 5.5.1 The assessment of sensitivity takes account of the landscape value and the susceptibility of the receptor to the onshore elements of the Project.
- 5.5.2 Landscape sensitivity often varies in response to both the type and phase of the development proposed and its location, such that landscape sensitivity needs to be considered on a case-by-case basis. It should not be confused with 'inherent sensitivity' where areas of the landscape may be referred to as inherently of 'high' or 'low' sensitivity. For example, a National Park may be described as inherently of high sensitivity on account of its designation and value, although it may prove to be less sensitive or susceptible to particular development, and of variable sensitivity across its geographical area. Alternatively, an undesignated landscape may be of high sensitivity to a particular development regardless of the lack of local or national designation.

Value of the landscape receptor

- 5.5.3 The value of a landscape receptor is a reflection of the value that society attaches to that landscape. The assessment of the landscape value will be classified as high, high-medium, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement, based on the following range of factors:
 - Landscape designations A receptor that lies within the boundary of a recognised landscape related planning designation will be of increased value, depending on the proportion of the receptor that is affected and the level of importance of the designation which may be international, national, regional or local. The absence of designation does not however preclude value, as an undesignated landscape receptor may be valued as a resource in the local or immediate environment.
 - Landscape quality The quality of a landscape receptor is a reflection of its attributes, such as scenic quality, sense of place, rarity and representativeness and the extent to which its valued attributes have remained intact. A landscape with consistent, intact, well-defined and distinctive attributes is considered to be of higher quality and, in turn, higher value, than a landscape where the introduction of elements has detracted from its character.
 - Landscape experience The experiential qualities that can be evoked by a landscape receptor can add to its value. These responses relate to a number of factors including cultural associations that may exist in art, literature or history; the recreational value of the landscape, or the iconic status of the landscape in its own right; and its contribution of other values such as nature conservation or archaeology.

Landscape susceptibility to change

- 5.5.4 The susceptibility of a landscape receptor to change is a reflection of its ability to accommodate the changes that will occur as a result of the addition of the onshore elements of the Project without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies. Some landscape receptors are better able to accommodate development than others due to certain characteristics that are indicative of capacity to accommodate change. These characteristics may or not also be special landscape qualities that underpin designated landscapes.
- 5.5.5 The assessment of the susceptibility of the landscape receptor to change will be classified as high, high-medium, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement. Indicators of landscape susceptibility to the type of development proposed (construction, operation / maintenance and decommissioning of the onshore substation, landfall and cable corridor) are based on the following criteria:
 - Overall Strength and Robustness Collectively the overall characteristics and qualities
 of a particular landscape result in a strong and robust landscape that is capable of
 reasonably accommodating the onshore elements of the Project without undue adverse
 effects on the special landscape qualities (in the case of a designated landscape) or the
 key characteristics for which an area of landscape character or a particular element it is
 valued.
 - Landscape Scale and Topography The scale and topography are large enough to
 physically accommodate the development footprint without the requirement of invasive
 earthworks or drainage. Topographical features such as narrow valleys or more
 complex and small-scale landforms such as drumlins, incised river valleys/gorges, cliffs

or rock outcrops are likely to be more susceptible to this type of development than broad, homogenous topography.

- Openness in the landscape may increase susceptibility to change because it can result in wider visibility of the Project, with enclosed landscapes able to offer a landscape framework with more screening potential, limiting visibility to a smaller area, although they may also be smaller scale and more complex which would increase susceptibility. In general, landscapes with greater enclosure are likely to be less susceptible to the onshore elements of the Project, than more open landscapes which may be less able to accommodate the onshore substation and landscape mitigation in the form of planting schemes.
- Land Cover Pattern Ancient and mature or long-established vegetation such as mature trees, woodland and protected hedgerows are likely to be more susceptible to the proposed development, particularly where these elements form part of a valued characteristic landscape pattern or feature. Conversely grassland/or arable crops and field boundaries comprising post and wire fencing, small, gappy hedges or young pioneer trees are likely to be less susceptible because they can be readily reinstated in the case of the cable corridor and are likely to be of lower landscape value.
- Skyline Prominent and distinctive skylines and horizons with important landmark features that are identified in the landscape character assessment, are generally considered to be more susceptible to development such as the onshore substation in comparison to broad, simple skylines which lack landmark features or contain other infrastructure features.
- Relationship with other Development and Landmarks Contemporary landscapes where there are existing similar developments (substations and pylons) or other forms of development (industry, mineral extraction, masts urban fringe/large settlement, major transport routes) that already have a characterising influence result in a lower susceptible to development in comparison to areas characterised by smaller scale, historic development and landmarks (historic villages with dense settlement patterns and associated buildings such as church towers).
- Rationale Some site locations have an obvious visual rationale for the Project in terms
 of the available space, access, simplicity and relationship to other similar forms of
 development. The design quality and embedded environmental measures will be high.
 Conversely a site may appear overly constrained and require greater engineering or
 additional construction activity to accommodate the Project with lower design quality
 and few embedded environmental measures.
- Remoteness, Naturalness, Wildness/Tranquillity Notably landscapes that are acknowledged to be particularly scenic, wild or tranquil are generally considered to be more susceptible to development in comparison to ordinary, cultivated or farmed/developed landscapes where perceptions of 'wildness' and tranquillity are less tangible. Landscapes which are either remote or appear natural may vary in their susceptibility to development.
- Landscape Context and Adjacent Landscapes The extent to which the Project will influence landscape receptors across the study area relates to the associations that exist between the landscape receptor within which the Project is located and the landscape receptor from which the onshore elements of the Project are being experienced. In some situations, this association will be strong, where the landscapes are directly related. For example, adjacent areas of landscape character may share or 'borrow' a high number of common characteristics. Landscape elements may be linked to or associated with wider landscape patterns such as individual trees forming part of an avenue or pattern of woodland copses, for example. In other situations, the

association between adjacent landscapes will be weak. The context and visual connection to areas of adjacent landscape character or designations has a bearing on the susceptibility to development.

Landscape sensitivity rating

5.5.6 A sensitivity assessment of the landscape receptor will be made by combining the assessment of the value of the landscape character receptor and its susceptibility to change. The evaluation of landscape sensitivity is described as 'High', 'High-medium' 'Medium' 'Medium-low' or 'Low' and is drawn from the consideration of a range of criteria that indicate landscape value and susceptibility. The basis for the assessment (for example whether it is an overall assessment, or specific to the location) will be made clear using evidence and professional judgement in the evaluation of sensitivity for each receptor. Criteria that tend towards higher or lower sensitivity are set out in **Table 5.1**.

	Higher	Lower	
Value			
	Designation: Designated landscapes/elements with national policy level protection or defined for their natural beauty. Evidence that the landscape/element is valued or used substantially for recreational activity.	Landscapes without formal designation. Despoiled or degraded landscape with little or no evidence of being valued by the community. Elements that are uncharacteristic such as non-natives or self-seeded vegetation that may need to be cleared.	
	Quality: Higher quality landscapes/elements with consistent, intact and well-defined, distinctive attributes.	Lower quality landscapes/elements with indistinct elements or features that detract from its inherent attributes.	
	Rarity: Rare or unique landscape character types, features or elements.	Widespread or 'common' landscape character types, features or elements.	
	Aesthetic/scenic: Aesthetic/scenic or perceptual aspects of designated wildlife, ecological or cultural heritage features that contribute to landscape character.	Limited wildlife, ecological or cultural heritage features, or limited contribution to landscape character.	
	Perceptual qualities: Landscape with perceptual qualities of wildness, remoteness or tranquillity.	Limited or no evidence that the landscape is used for recreational activity.	
	Cultural associations: Landscape with strong cultural associations that contributes to scenic quality.	Landscape with few cultural associations.	
Susceptibility to change			
	Strength and robustness: Fragile landscape vulnerable and lacking the ability to accommodate change	Robust landscape, able to accommodate change or loss of features without undue adverse effects	

Table 5.1 Landscape sensitivity to change

	Higher	Lower
	Landscape Scale: A landscape of a suitably large enough scale to accommodate the development.	A smaller scale landscape that may require further engineering to accommodate the development.
	Openness/Enclosure: An open landscape with limited screening or potential may be of higher susceptibility to the onshore elements of the Project.	An enclosed landscape with screening or potential for mitigation may be of lower susceptibility to the onshore elements of the Project.
	Reinstatement: Lower value, non- characteristic landcover and elements capable of rapid reinstatement.	Higher value, characteristic landcover and elements that cannot be easily reinstated or replaced.
	Skyline: Distinctive undeveloped skylines with landmark features.	Developed, nondistinctive skylines.
	Association: Weak and indirect association. Other development may be of a smaller scale or historic.	Strong or direct association other similar contemporary developments/landscape character.
	Rationale: Strong landscape rationale and opportunity with high degree of design quality and/or embedded environmental measures.	Landscape with numerous environmental and technical constraints with lower design quality and/or embedded environmental measures.
	Perceptual Qualities: Perceptual qualities associated with particular scenic qualities, wildness or tranquillity.	Contemporary, cultivated/settled or developed landscapes are likely to have a lower susceptibility.
	Landscape Context: Adjacent landscape character context connected by borrowed character and views.	Host landscape character is separate from surrounding/adjacent landscape character
Sensitivity to change	High Med	lium 🔶 Low

5.6 Landscape magnitude of change

5.6.1 The magnitude of change affecting landscape receptors is an expression of the scale of change that would result from the onshore elements of the Project. In assessing the magnitude of change the assessment has focused on the size or scale of change and its geographical extent.

Size or scale of change

- 5.6.2 This criterion relates to the size or scale of change to the landscape that would arise as a result of the onshore elements of the Project, based on the following factors.
 - Landscape Elements: -The degree to which the landscape elements or pattern of elements that makes up the landscape character would be altered by the onshore elements of the Project, through the loss, alteration or addition of elements in the landscape. The magnitude of change would generally be higher if the features that make up the landscape character are extensively removed or altered, and/or if many new components are added to the landscape.

- Landscape Characteristics The extent to which the effect of the onshore elements of the Project change, (physically or perceptually) the key characteristics of the landscape which may be important to its distinctive character. This may include, for example, the scale of the landform, its relative simplicity, complexity or irregularity, the nature of the landscape context, the grain or orientation of the landscape, the degree to which the receptor is influenced by external features and the juxtaposition of the onshore elements of the Project in relation to these key characteristics.
- Landscape Character/Designation The degree to which landscape character receptors would be changed by the addition of the onshore elements of the Project. If the onshore elements of the Project are located in a landscape receptor that is already affected by other similar development, this may reduce the magnitude of change if there is a high level of integration and the developments form a unified and cohesive feature in the landscape. In the case of designated landscapes, the degree of change is considered in light of the effects on the special landscape qualities which underpin the designation and the effect on the integrity of the designation.
- All landscapes change over time and much of that change is managed or planned. Often landscapes will have management objectives for 'protection' or 'accommodation' of development. The scale of change may be localised, or occurring over parts of an area, or more widespread affecting whole landscape character areas and their overall integrity
- Distance The size and scale of change is also strongly influenced by the proximity of the Project to the receptor and the extent to which the development can be seen as a characterising influence on the landscape. Consequently, the scale or magnitude of change is likely to be lower in respect of landscape receptors that are distant from the onshore elements of the Project and/or screened by intervening landform, vegetation and built form to the extent that the scale of their influence on landscape receptors is small or limited. Conversely, landscapes closest to the development are likely to be most affected. Host landscapes (where the development is located within a 'host' landscape character unit) would be directly affected whilst adjacent areas of landscape character would be indirectly affected.

Geographical extent

- 5.6.3 Landscape effects are described in terms of the geographical extent or physical area that would be affected (described as a linear or area measurement). This should not be confused with the scale of the development or its physical footprint. The manner in which the geographical extent of the landscape effect is described for different landscape receptors is explained as follows.
 - Landscape Elements:
 - The geographical extent of landscape elements may be objectively measured in terms of numbers, area or linear measurement. For example, the number of trees, area of woodland/or length of hedgerow affected may be recorded.
 - Landscape Character/Characteristics:
 - The extent of the effects on landscape character will vary depending on the specific nature of the onshore elements of the Project. This is not simply an expression of visibility or the extent of the ZTV. It is a specific assessment of the extent of landscape character that would be changed by the Project in terms of its character, key characteristics and elements.

- Landscape Designations:
 - In the case of a designated landscape, this refers to the extent the special landscape qualities of the designation are affected and whether this can be defined in terms of area or linear measurements, or subjectively (with the support of panel and/or peer review) and whether the integrity of the designation is affected.

Duration and reversibility

- 5.6.4 The duration and reversibility of landscape effects would be based on the period over which the onshore elements of the Project are likely to exist (during construction and operation / maintenance) and the extent to which these elements would be removed (during decommissioning) and the effects reversed at the end of that period. Long-term, mediumterm and short-term landscape effects are defined as follows:
 - Long-term more than 10 years (may be defined as permanent or reversible);
 - Medium-term 6 to 10 years; and
 - Short-term 1 to 5 years.

Landscape magnitude of change rating

- 5.6.5 The 'magnitude' or 'degree of change' resulting from the onshore elements of the Project is described as 'High', 'High-medium', 'Medium', 'Medium-low' 'Low' or 'Negligible-Zero'. The basis for the assessment of magnitude for each receptor will be made clear using evidence and professional judgement.
- 5.6.6 The levels of magnitude of change that can occur are defined in **Table 5.2**.

Magnitude of landscape change	Examples of Landscape Magnitude
High	 Size/Scale: A large-scale change and major loss of key landscape elements/characteristics or the addition of large scale or numerous new and uncharacteristic features or elements that would affect the landscape character and the special landscape qualities/integrity of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor. Geographical extent: The size or scale of change would typically, but not always affect a large geographical extent or area and may be close to the proposed development.
High-medium	Intermediate rating with combination of criteria from high or medium magnitude.
Medium	 Size/Scale: A medium scale change and moderate loss of some key landscape elements/characteristics or the addition of some new medium scale uncharacteristic features or elements that could partially affect the landscape character and the special landscape qualities/integrity of a landscape designation. Directly affecting a host landscape receptor or indirectly affecting a nearby receptor. Geographical extent: The size or scale of landscape change would typically, but not always affect a more localised geographical extent at an intermediate distance from the proposed development.
Medium-low	Intermediate rating with combination of criteria from medium or low magnitude.
Low	 Size/Scale: A small-scale change and minor loss of a few landscape elements/non key characteristics, or the addition of some new small-scale features or elements of limited characterising influence on landscape character/designations. Geographical extent: There may be a small partial change in landscape character, typically, but not always affecting a localised geographical extent at some distance from the proposed development.
Negligible - Zero	 Size/Scale: A very small-scale change that may include the loss or addition of some landscape elements of limited characterising influence. The landscape characteristics and character would be unaffected. Geographical extent: Typically affecting a very small geographical extent at greater distance from the proposed development.

Table 5.2 Landscape magnitude of change ratings

5.7 Evaluating landscape effects and significance

- 5.7.1 The level of landscape effect is evaluated through the combination of landscape sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations. This process is assisted by the matrix in **Table 8.1** which is used to guide the assessment.
- 5.7.2 Further information is also provided about the nature of the effects (whether these would be direct/indirect; temporary/permanent/reversible; beneficial/neutral/adverse or cumulative).

Significant landscape effects

5.7.3 A significant effect would occur where the combination of the variables results in the onshore elements of the Project having a defining effect on the landscape receptor, or where changes of a lower magnitude affect a landscape receptor that is of particularly high sensitivity. A major loss or irreversible effect over an extensive area or landscape character, affecting landscape elements, characteristics and/or perceptual aspects that are key to a nationally valued landscape are likely to be significant.

Non-significant landscape effects

5.7.4 A non-significant effect would occur where the effect of the onshore elements of the Project is not defining, and the landscape character of the receptor continues to be characterised principally by its baseline characteristics. Equally a small-scale change experienced by a receptor of high sensitivity may not significantly affect the special landscape quality or integrity of a designation. Reversible effects, on elements, characteristics and character that are of small-scale or affecting lower value receptors are unlikely to be significant.

6. Assessing visual effects

6.1.1 Visual Effects are concerned wholly with the effect of the development on views, and the general visual amenity and are defined by the Landscape Institute in GLVIA 3, paragraphs 6.1 as follows:

"An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern ... is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views."

- 6.1.2 Visual effects are identified for different receptors (people) who would experience the view at their place of residence, within their community, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:
 - visual effect: a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view; and
 - cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.
- 6.1.3 The level of visual effect (and whether this is significant) is determined through consideration of the sensitivity of each visual receptor (or range of sensitivities for receptor groups) and the magnitude of change that would be brought about by the construction, operation / maintenance and decommissioning of the onshore elements of the Project.

6.2 **Zone of Theoretical Visibility (ZTV)**

- 6.2.1 Plans mapping the Zone of Theoretical Visibility (ZTV) are used to analyse the extent of theoretical visibility of development or part of a development, across the study area and to assist with viewpoint selection. The ZTV does not however, take account of the screening effects of buildings, localised landform and vegetation, unless specifically noted (see individual figures). As a result, there may be roads, tracks and footpaths within the study area which, although shown as falling within the ZTV, are screened or filtered by built form and vegetation, which would otherwise preclude visibility.
- 6.2.2 The ZTVs provide a starting point in the assessment process and accordingly tend towards giving a 'worst case' or greatest calculation of the theoretical visibility.

6.3 Viewpoint analysis

- 6.3.1 Viewpoint analysis is used to assist the assessment and is conducted from selected viewpoints within the study area. The purpose of this is to assess both the level of visual effect for particular receptors and to help guide the design process and focus the assessment. A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur. By arranging the viewpoints in order of distance it is possible to define a threshold or outer geographical limit, beyond which significant effects would be unlikely.
- 6.3.2 The assessment involves visiting the viewpoint location and viewing wirelines and photomontages prepared for each viewpoint location. The fieldwork is conducted in periods of fine weather with good visibility and considers seasonal changes such as reduced leaf cover or hedgerow maintenance.

- 6.3.3 The LVIA therefore includes viewpoint analysis prepared for each viewpoint and presented as supporting evidence in an appendix to the LVIA. A summary table of the findings will also be provided in order of distance from the development site. This summary table will assist in defining the direction, elevation, geographical spread and nature of the potential visual effects and identify areas where significant effects are likely to occur. This approach seeks to provide clarity and confidence to consultees and decision makers by allowing the detailed judgements on the magnitude of visual change to be more readily scrutinised and understood.
- 6.3.4 Two sets of viewpoints will be used, one set for the onshore LVIA study area and another set for the offshore elements of the Project which has a wider study area.
- 6.3.5 The viewpoint analysis is used to assist the visual assessment of visual receptor locations reported in the baseline.

6.4 Evaluating visual sensitivity to change

6.4.1 In accordance with paragraphs 6.31-6.37 of GLVIA3, the sensitivity of visual receptors will be determined by a combination of the value of the view and the susceptibility of the visual receptors to the change likely to result from the onshore elements of the Project on the view and visual amenity.

Value of the view

- 6.4.2 The value of a view or series of views reflects the recognition and importance attached either formally through identification on mapping or being subject to planning designations, or informally through the value which society attaches to the view(s). The value of a view will be classified as high, high-medium, medium, medium-low or low and the basis for this assessment will be made clear using evidence and professional judgement, based on the following criteria.
 - Formal recognition The value of views can be formally recognised through their identification on OS or tourist maps as formal viewpoints, sign-posted and with facilities provided to add to the enjoyment of the viewpoint such as parking, seating and interpretation boards. Specific views may be afforded protection in local planning policy and recognised as valued views. Specific views can also be cited as being of importance in relation to landscape or heritage planning designations, for example the value of a view would be increased if it presents an important vista from a designed landscape or lies within or overlooks a designated area, which implies a greater value to the visible landscape.
 - Informal recognition Views that are well-known at a local level and/or have particular scenic qualities can have an increased value, even if there is no formal recognition or designation. Views or viewpoints are sometimes informally recognised through references in art or literature and this can also add to their value. A viewpoint that is visited and appreciated by a large number of people would generally have greater importance than one gained by very few people.

Susceptibility to change

6.4.3 Susceptibility relates to the nature of the viewer experiencing the view and how susceptible they are to the potential effects of the onshore elements of the Project. A judgement to determine the level of susceptibility therefore relates to the nature of the viewer and their experience from that particular viewpoint or series of viewpoints, classified as high, highmedium, medium, medium-low or low and based on the following criteria.

- Nature of the viewer The nature of the viewer is defined by the occupation or activity of the viewer at the viewpoint or series of viewpoints. The most common groups of viewers considered in the visual assessment include residents, motorists, and people taking part in recreational activity or working. Viewers, whose attention is focused on the landscape, or with static long-term views, are likely to have a higher sensitivity. Viewers travelling in cars or on trains would tend to have a lower sensitivity as their view is transient and moving. The least sensitive viewers are usually people at their place of work as they are generally less sensitive to changes in views.
- Experience of the viewer The experience of the visual receptor relates to the extent to which the viewer's attention or interest may be focused on the view and the visual amenity they experience at a particular location. The susceptibility of the viewer to change arising from the onshore elements of the Project may be influenced by the viewer's attention or interest in the view, which may be focused in a particular direction, from a static or transitory position, over a long or short duration, and with high or low clarity. For example, if the principal outlook from a settlement is aligned directly towards the onshore elements of the Project, the experience of the visual receptor would be altered more notably than if the experience relates to a glimpsed view seen at an oblique angle from a car travelling at high speed. The visual amenity experienced by the viewer varies depending on the presence and relationship of visible elements, features or patterns experienced in the view and the degree to which the landscape in the view may accommodate the influence of the onshore elements of the Project.

Visual sensitivity rating

6.4.4 An overall level of sensitivity will be applied for each visual receptor or view – High, Highmedium, Medium, Medium-low, or Low – by combining individual assessments of the value of the view and the susceptibility of the visual receptor to change. Each visual receptor, meaning the particular person or group of people likely to be affected at a specific viewpoint, is assessed in terms of their sensitivity. The basis for the assessments will be made clear using evidence and professional judgement in the evaluation of each receptor. Criteria that tend towards higher or lower sensitivity are set out in **Table 6.1**.

	Higher	Lower
Value		
	Specific viewpoint identified in OS maps and/or tourist information and signage.	Viewpoint not identified in OS maps or tourist information and signage.
	Facilities provided at viewpoint to aid the enjoyment of the view.	No facilities provided at viewpoint to aid enjoyment of the view.
	View afforded protection in planning policy.	View is not afforded protection in planning policy.
	View is within or overlooks a designated landscape, which implies a higher value to the visible landscape.	View is not within, nor does it overlook, a designated landscape.

Table 6.1 Visual sensitivity to change

	Higher	Lower
	View has informal recognition and well- known at a local level, as having particular scenic qualities.	View has no informal recognition and is not known as having particular scenic qualities.
	View or viewpoint is recognised through references in art or literature.	View or viewpoint is not recognised in references in art or literature.
	View has high scenic qualities relating to the content and composition of the visible landscape.	View has low scenic qualities relating to the content and composition of the visible landscape.
Susceptibility to	change	
	Viewer who is likely or liable to be influenced by the onshore elements of the Project.	Viewer who is unlikely or not liable to be influenced by the onshore elements of the Project.
	Viewers such as walkers, or tourists, whose main attention and interest are on their surroundings.	Viewers whose main attention is not focused on their surroundings, such as people at work, or specific forms of recreation.
	Residents that gain static, long-term views of the onshore elements of the Project in their principal outlook.	Viewers who are transient and dynamic, such as those travelling in cars or on trains, where the view is of short duration.
Susceptibility to	change	
	Viewpoint is visited or used by a large number of people.	View is visited or gained by very few people.
	A view that is focused in a specific directional vista, with notable features of interest in a particular part of the view.	Open views with no specific point of interest.
	Viewers are focused on the experience of a high level of visual amenity at the location due to its overall pleasantness as an attractive visual setting or backdrop to activities.	The visual amenity experienced at the location by viewers is less pleasant or attractive than might otherwise be the case.
Sensitivity to change	High Med	dium Low

6.5 Visual magnitude of change

6.5.1 The visual magnitude of change is an expression of the scale of change that would result from the visibility of the onshore elements of the Project. In assessing the magnitude of change the assessment has focused on the size or scale of change its geographical extent and its duration and reversibility which are all stated separately in relation to the assessed effects.

Size or scale of change

- 6.5.2 An assessment will be made of the size or scale of change in the view that is likely to be experienced as a result of the onshore elements of the Project, based on the following criteria.
 - Distance -The distance between the visual receptor/viewpoint and the onshore elements of the Project. Generally, the greater the distance, the lower the magnitude of change, as the onshore elements of the Project would constitute a smaller-scale component of the view.
 - Size The amount and size of the onshore elements of the Project that would be seen. Visibility may range from a small or partial visibility of the onshore elements of the Project to all of the onshore elements of the Project being visible. Generally, the larger and greater number of the onshore elements of the Project that appear in the view, the higher the magnitude of change.
 - This is also related to the degree to which development may be wholly or partly screened by landform, vegetation (seasonal) and/or built form. Conversely open views are likely to reveal more of a development, particularly where this is a key characteristic of the landscape.
 - Scale The scale of the change in the view, with respect to the loss or addition of features in the view and changes in its composition. The scale of the onshore elements of the Project may appear larger or smaller relative to the scale of the receiving landscape.
 - Field of View The vertical/horizontal field of view (FoV) and the proportion of view that is affected by the onshore elements of the Project. Generally, the more of the proportion of a view that is affected, the higher the magnitude of change would be. If the onshore elements of the Project extend across the whole of the open outlook, the magnitude of change would generally be higher as the full view would be affected. Conversely, if the onshore elements of the Project extent over a narrow part of an open view, the magnitude of change is likely to be reduced as the onshore elements of the Project would not affect the whole view or outlook. This can in part be described objectively by reference to the horizontal/vertical FoV affected, relative to the extent and proportion of the available view.
 - Contrast The character and context within which the onshore elements of the Project would be seen and the degree of contrast or integration of any new features with existing landscape elements, in terms of scale, form, mass, line, height, colour, luminance and motion. Developments which contrast or appear incongruous in terms of colour, scale and form are likely to be more visible and have a higher magnitude of change.
 - Consistency of image The consistency of image of the onshore elements of the Project in relation to other developments. The magnitude of change for the onshore elements of the Project is likely to be lower if it appears broadly similar to other developments in the landscape in terms of its scale, form and general appearance. New development is more likely to appear as logical components of the landscape with a strong rationale for their location.
 - Skyline/Background Whether the onshore elements of the Project would be viewed against the skyline or a background landscape may affect the level of contrast and magnitude. For example, skyline developments may appear more noticeable, particularly where they affect open and uninterrupted or undeveloped horizons. Conversely, development may also appear more noticeable when viewed against a darker background landscape, such as forestry. In these cases, the magnitude of change would tend to be higher.

If the onshore elements of the Project add to an already developed skyline the magnitude of change would tend to be lower.

- Number Generally, the greater the number of separate development components seen simultaneously or sequentially, the higher the magnitude of change and this may lead to whole project effect. Further cumulative effects would occur in the case of separate developments and their spatial relationship to each other would affect the magnitude of change. For example, development that appears as an extension to an existing development would tend to result in a lower magnitude of change than a separate, new development.
- Nature of Visibility The nature of visibility is a further factor for consideration. The
 onshore elements of the Project may be subject to various phases of development
 change and the manner in which the development may be viewed could be intermittent
 or continuous and/or seasonally, due to periodic management or leaf fall.

Geographical extent

- 6.5.3 The geographic extent over which the visual effects would be experienced is also be assessed. This is distinct from the size or scale of effect and is described in terms of the physical area or location over which it would be experienced (described as a linear or area measurement). The extent of the effects would vary according to the specific nature of the onshore elements of the Project and is principally assessed through ZTV, field survey and viewpoint analysis of the extent of visibility likely to be experienced by visual receptors. The geographical extent of visual effects is described as per the following examples:
 - The geographical extent can be described as an area measurement or proportion of the total receptor affected. For example, effects on people within a particular area such as a golf course or area of common land can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people within that area. The geographical extent of that visual effect can be expressed as approximately '5 hectares' or '10%' of the common land or a golf course area.
 - The geographical extent can be described as a linear measurement (m or km) according to the length of route affected. For example, effects on people travelling on a route through the landscape such as a road or footpath can be illustrated via a 'representative viewpoint' that represents a similar visual effect, likely to be experienced by larger numbers of people along that route. The geographical extent of that visual effect can be expressed as approximately '2km' or '10%' of the total length of the route.
 - The geographical extent of a visual effect experienced from a specific viewpoint may be limited to that location alone. (An example of a 'specific viewpoint' is a public viewpoint recommended in tourist literature such as a well visited hill summit. An example of an 'illustrative viewpoint' is a particular location within a built up or well vegetated area where an uncharacteristically open view exists).

Duration and reversibility

- 6.5.4 The duration and reversibility of visual effects would be based on the period over which the onshore elements of the Project are likely to exist (during construction, operation and maintenance) and the extent to which these elements would be removed (during decommissioning) and the effects reversed at the end of that period. Long-term, medium-term and short-term visual effects are defined as follows:
 - long-term more than 10 years (may be defined as permanent of reversible);
 - medium-term 6 to 10 years; and

• short-term – 1 to 5 years.

Visual magnitude of change rating

6.5.5 The 'magnitude' or 'degree of change' resulting from the onshore elements of the Project is described as 'High', 'High-medium', 'Medium', 'Medium-low' 'Low' and 'Negligible-Zero'. The basis for the assessment of magnitude for each receptor will be made clear using evidence and professional judgement and some examples of the levels of magnitude of change that can occur on views are defined in **Table 6.2**.

Magnitude of landscape change	Examples of Visual Magnitude			
High	 Size and Scale: A very large - large and dominant change to the view. Number: Involving the loss/addition of a large number of features/elements. Distance: Typically appearing closer to the viewer in the foreground. FoV: Affecting a large vertical and wide horizontal FoV. Visibility: Multiple phase development with continuous / sequential visibility Contrast: Strong contrast with surroundings with little or no screening. Skyline: Visible on the skyline as a new feature. Consistency of Image: Typically experienced from representative viewpoints illustrating a visual effect likely to be experienced by larger numbers of people, relative to the activity, affecting a large area or length/proportion of route. May also be experienced from a specific viewpoint. 			
High-medium	Intermediate rating with combination of criteria from high or medium magnitude of change category.			
Medium	 Size and Scale: Number: Distance: FoV: Visibility: Contrast: Skyline: Consistency of Image: Typically experience be experienced by a medium area or lenguised of the system.	 A medium and prominent change to the view. Involving the loss/addition of a number of features/elements. Typically appearing in the middle ground. Affecting a medium vertical and a medium horizontal FoV. Multiple phase development with intermitant / sequential visibility Contrast with surroundings and may benefit from some screening. Visible on the skyline along with other features. Different from other developments, some visual rationale. nced from representative viewpoints illustrating a visual effect likely to y a medium number of people, relative to the activity, affecting a ength/proportion of route. May also be experienced from a specific 		
Medium-low	Intermediate rating with combination of criteria from medium or low magnitude of change category.			
Low	 Size and Scale: Number: Distance: FoV: 	A small / noticeable change, could be missed by casual observer. Involving loss/addition of a small number of features/elements. Typically appearing in the background. Affecting a small vertical and a parrow horizontal FoV		

Table 6.2Visual Magnitude of change

Examples of Visual Magnitude

Magnitude of

landscape

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change		
	 Visibility: Contrast: Skyline: Consistency of Image: Typically experience numbers of people, of route. May also	Simple, single development, intermittently and infrequently visible. Some parity, 'fits' with surroundings and benefits from screening. Partly visible on a developed skyline or not visible on the skyline. Similar from other developments with visual rationale, appearing reasonably well accommodated within its surroundings. ed from illustrative viewpoints likely to be experienced by low relative to the activity, affecting a smaller area or length/proportion be experienced from a specific viewpoint.
Negligible - Zero	 Size and Scale: Number: Distance: FoV: Visibility: Contrast: Skyline: Consistency of Image: Typically experience numbers of people, of route. May also 	A small or negligible change, need to 'look for it'. Involving the loss/addition of a small number of features/elements. Typically appearing in the far distance. Affecting a small vertical and a very narrow horizontal FoV. Simple, single development, intermittently and infrequently visible. Blends with surroundings and/or is well screened. Partly visible on a developed skyline or not visible on the skyline. Similar from other developments with strong visual rationale, of appearing well accommodated within its surroundings. ed from illustrative viewpoints likely to be experienced by low relative to the activity, affecting a smaller area or length/proportion be experienced from a specific viewpoint.

6.6 Evaluating visual effects and significance

Introduction

- 6.6.1 The level of visual effect is evaluated through the combination of visual sensitivity and magnitude of change. Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' or 'not significant' as required by the relevant EIA Regulations. This process is assisted by the matrix in **Table 8.1** which is used to guide the assessment. The factors considered in the evaluation of the sensitivity and the magnitude of the change resulting from the onshore elements of the Project and their conclusion, will be presented in a comprehensive, clear and transparent manner.
- 6.6.2 Further information is also provided about the nature of the effects (whether these would be direct/indirect; temporary/permanent/reversible; beneficial/neutral/adverse or cumulative).

Significant visual effects

6.6.3 A significant effect is more likely to occur where a combination of the variables results in the onshore elements of the Project having a defining effect on the view or visual amenity or where changes affect a visual receptor that is of high sensitivity.

Non-significant visual effects

6.6.4 A non-significant effect is more likely to occur where a combination of the variables results in the onshore elements of the Project having a non-defining effect on the view or visual amenity or where changes affect a visual receptor that is of low sensitivity.

Weather conditions

6.6.5 The assessment of visual effects is undertaken in clear weather with good to excellent visibility. This means that the viewpoint assessment represents a maximum or fair assessment of the likely visual effects. The same viewpoint may be experienced under less optimal viewing conditions resulting in a significant effect appearing as non-significant, due to the change in the variable weather conditions. Due to the conditions of the assessment the reverse (a non-significant effect appearing as significant) is unlikely to occur.

7. Assessing cumulative landscape and visual effects

- 7.1.1 NatureScot's guidance, Assessing the Cumulative Impact of Onshore Wind Energy Developments (2021) is widely used across the UK to inform the specific assessment of the cumulative effects of both onshore and offshore windfarms and can be adapted to other forms of development such as grid infrastructure. The NatureScot (2021) guidance defines:
 - "Cumulative effects as the additional changes caused by a Proposed Development in conjunction with other similar developments or as the combined effect of a set of developments taken together (SNH, 2012: p4);
 - Cumulative landscape effects are those effects that 'can impact on either the physical fabric or character of the landscape, or any special values attached to it' (SNH, 2012, p10); and
 - Cumulative visual effects are those effects that can be caused by combined visibility, which occurs where the observer is able to see two or more developments from one viewpoint and/or sequential effects which occur when the observer has to move to another viewpoint to see different developments" (SNH, 2012, p11).
- 7.1.2 The potential cumulative effects of the Project with other relevant existing, consented or proposed development are described as follows.
 - 'Whole project' effects resulting from the combined effects of the onshore and offshore elements of the Project. These effects are assessed as part of the main SLVIA / LVIA.
 - The cumulative effects of the Project in addition to and in combination with other similar development (wind farms and other relevant development such as grid related projects) that are either consented/under construction; the subject of a valid planning application; or proposed as part of relevant plans and programmes.
- 7.1.3 The cumulative assessment methodology for SLVIA / LVIA will be described once the scope of any cumulative assessment is confirmed and agreed through the consultation process.

8. Evaluation of significance

- 8.1.1 The matrix presented in **Table 8.1** is used as a guide to illustrate the LVIA process. In line with the emphasis placed in GLVIA3 upon the application of professional judgement, an overly mechanistic reliance upon a matrix is avoided through the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape and visual receptor. Such narrative assessments provide a level of detail over and above the outline assessment provided by use of the matrix alone.
- 8.1.2 The landscape and visual assessment unavoidably, involves a combination of quantitative and qualitative assessment and wherever possible cross references will be made to objective evidence, baseline figures and/or to photomontage visualisations to support the assessment conclusions. Often a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach. Importantly each effect results from its own unique set of circumstances and have been assessed on a case by case basis. The matrix as presented in **Table 8.1** should therefore be considered as a guide and any deviation from this guide will be clearly explained in the assessment.
- 8.1.3 Significant landscape and visual effects are highlighted in bold and shaded dark green in **Table 8.1**. They relate to all those effects that result in a '**Major**' or a '**Major/Moderate**' level of effect. In some circumstances, '**Moderate**' levels of effect (shaded light green) also have the potential, subject to the Applicant's opinion, to be considered as significant and these exceptions are also highlighted in bold in the text and will be explained as part of the assessment, where they occur. White or un-shaded boxes in **Table 8.1** indicate a non-significant effect.
- 8.1.4 In those instances where there would be no effect, the magnitude has been recorded as 'Zero' and the level of effect as 'None'.

Table 8.1 Evaluation of landscape and visual effects

Sensitivity Magnitude of change						
	High	Medium-high	Medium	Medium-low	Low	Negligible-zero
High	Major (Significant)	Major (Significant)	Major/Moderate (Significant)	Moderate*	Moderate*	Minor
High - medium-	Major (Significant)	Major/Moderate (Significant)	Moderate*	Moderate*	Moderate/Minor	Minor
Medium	Major/Moderate (Significant)	Moderate*	Moderate*	Moderate/Minor	Minor	Minor/Negligible
Medium-low	Moderate*	Moderate*	Moderate/Minor	Minor	Minor/Negligible	Negligible
Low	Moderate/Slight	Moderate/Minor	Minor	Minor/Negligible	Negligible	Negligible
*Note: Moderate levels of effect may/may not be significant subject to the Applicant's opinion which shall be clearly explained.						

9. Nature of effects

- 9.1.1 The EIA Regulations 2017 state that the EIA Report should define 'the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development'.
- 9.1.2 Cumulative effects have been described in **Section 7**, and '*short-term, medium-term and long-term, permanent and temporary*' are described in **Sections 5 and 6** under the heading 'Duration of Effect'.
- 9.1.3 The definition of the remaining terms used in this assessment is defined here.

9.2 Direct and indirect effects

- 9.2.1 Direct landscape effects relate to the host landscape and concern both physical and perceptual effects on the receptor.
- 9.2.2 Indirect landscape effects relate to those landscapes and receptors which separated by distance or remote from the development and therefore are only affected in terms of perceptual effects. The Landscape Institute also defines indirect effects as those which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.
- 9.2.3 Visual effects are generally all considered as direct effects. An indirect visual effect may however be used to define a visual effect on a view that is not in the direction of the main view of the viewer as described by the following examples.
 - Road users generally face the road directly ahead in the direction of travel and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of travel they may be described as indirect.
 - Designed landscapes and vistas/viewpoints may be orientated in a particular direction and visual effects affecting those views may be described as direct effects. Where the visual effect is experienced in views oblique to the direction of the designed or main/primary view they may be described as indirect.
- 9.2.4 Secondary effects (or effects subsequent to an initial effect) are covered in this assessment by indirect effects.

9.3 **Positive and negative effects**

- 9.3.1 Guidance provided by the in GLVIA3 on the nature of effect (i.e. beneficial or adverse) states that 'in the LVIA, thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity', but it does not provide guidance as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and, where applied, this involves reasoned professional opinion.
- 9.3.2 In this assessment the nature of effects refers to whether the landscape and/or visual effect of the onshore elements of the Project is positive or negative (herein referred to as 'beneficial'/'neutral' or 'adverse').
- 9.3.3 In relation to many forms of development, the LVIA will identify 'beneficial' and 'adverse' effects by assessing these under the term 'Nature of Effect'. The landscape and visual

effects of large-scale infrastructure are difficult to categorise in either of these brackets as, unlike other disciplines, there are no definitive criteria by which the effects can be measured as being categorically 'beneficial' or 'adverse'. In some disciplines, such as noise or ecology, it is possible to quantify the effect in numeric terms, by objectively identifying or quantifying the proportion of a receptor that is affected and assessing the nature of that effect in justifiable terms. However, this is not the case in relation to landscape and visual effects where the approach combines quantitative and qualitative assessment.

- 9.3.4 Generally, in the development of 'new' energy infrastructure, a precautionary approach is adopted, which assumes that significant landscape and visual effects will be weighed on the adverse side of the planning balance. Unless it is stated otherwise, the effects considered in the assessment will be considered to be adverse. Beneficial or neutral effects may, however, arise in certain situations and are stated in the assessment where relevant, based on the following definitions.
 - Beneficial effects contribute to the landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, beneficial attributes. The development contributes to the landscape by virtue of good design or the introduction of new landscape planting. The removal of undesirable existing elements or characteristics can also be beneficial, as can their replacement with more appropriate components.
 - Neutral effects occur where the development fits with the existing landscape character or visual amenity. The development neither contributes to or detracts from the landscape and visual resource and can be accommodated with neither beneficial or adverse effects, or where the effects are so limited that the change is hardly noticeable. A change to the landscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation.
 - Adverse effects are those that detract from the landscape character or quality of visual attributes experienced, through the introduction of elements that contrast, in a detrimental way, with the existing characteristics of the landscape and visual resource, or through the removal of elements that are key in its characterisation.
10. Visual representations

10.1.1 Zones of Theoretical Visibility (ZTVs) and visualisations (wirelines or wirelines and photomontages) are graphical images produced to assist and illustrate the LVIA and the cumulative assessment. The methodology use for viewpoint photography and photomontages will be produced in accordance with the SNH guidance on *Visual Representation of Wind Farms,* Version 2.2 (2017b), the *Guidelines for Landscape and Visual Impact Assessment,* Third Edition (GLVIA 3) (Landscape Institute and IEMA, 2013) and the Landscape Institute Technical Guidance Note on *Visual Representation of Development Proposals* (2019b).

10.2 Methodology for production of ZTVs

- 10.2.1 The ZTVs will be calculated using computer software to generate a ZTV of the onshore elements of the Project, to demonstrate the theoretical extent of visibility from any point in the study area.
- 10.2.2 A 3D computer model will be developed of the existing landscape and key reference using digital terrain data as follows.
 - Ordnance Survey Terrain 50: Used to produce the main or standard ZTV plot and wirelines, these tiles provide a digital record of the existing landform of Great Britain, or Digital Terrain Model (DTM) at 10m elevation intervals based on 50m grid squares and models representing the specified geometry and position of the onshore elements. The computer model will include the entire study area and takes account of the effects caused by atmospheric refraction and the Earth's curvature.
 - Ordnance Survey LIDAR Composite 2m: Used to produce a more detailed ZTV plots using 2m grid squares with surface features. It therefore takes into account the screening effects of vegetation, buildings or other surface features that may prevent or reduce visibility (insofar as they are represented in the LIDAR data). The computer model will include the entire study area and takes account of atmospheric refraction and the Earth's curvature.
- 10.2.3 The resulting ZTV plots will be overlaid on Ordnance Survey mapping at an appropriate scale and presented as figures using desktop publishing or graphic design software.
- 10.2.4 Cumulative ZTV plots based on the intervisibility of the onshore elements of the Project and other relevant developments within the study area will also be produced.
- 10.2.5 There are limitations in this theoretical production, and these should be considered in the interpretation and use of the ZTV as follows.
 - Where the ZTV has been calculated using Ordnance Survey Terrain 50 this will not account for vegetation or built form unless added in the form of OS Vectormap data or digitally added and stated on the figure.
 - Where the ZTV has been calculated using Ordnance Survey LIDAR Composite only those surface features picked up by LIDAR data will be represented.
 - The ZTVs are based on theoretical visibility from 2m above ground level.
 - The ZTV shows higher to lower visibility based on the amount of the onshore elements of the Project visible as represented by a grid of data points representing the 3D envelope, model or annotation of the onshore elements of the Project.

- The ZTV does not indicate the decrease in visibility that occurs with increased distance from the offshore elements of the Project. The nature of what is visible from 2km away will differ markedly from what is visible from 500m away, although both could be indicated in the ZTV as having the same level of visibility.
- 10.2.6 These limitations mean that while the ZTV is used as a starting point in the assessment, providing an indication of where the onshore elements of the Project would theoretically be visible and tending to present a 'worst case' or over estimate of the theoretical visibility. The information drawn from the ZTV is checked by field survey observation.

10.3 Methodology for baseline photography

- 10.3.1 Once a view has been selected, the location is visited, confirmed, and assessed with the aid of a wireline or similar visualisation in the field. A photographic record is taken to record the view and the details of the viewpoint location and associated data are recorded to assist in the production of visualisations and to validate their accuracy.
- 10.3.2 The following photographic information is recorded:
 - date, time, weather conditions and visual range;
 - GPS recorded 12 figure grid reference accurate to ~5-10m;
 - GPS recorded Above Ordnance Datum (AOD) height data;
 - use of a fixed 50mm focal length lens is confirmed;
 - horizontal field of view (in degrees); and
 - bearing to Target Site.
- 10.3.3 The photographs used to produce the photomontages will be taken with a digital SLR camera set to produce photographs equivalent to that of a manual 35mm SLR camera with a fixed 50mm focal length lens. The photographs will be taken on a tripod with a panohead at a height of approximately 1.5m above ground.
- 10.3.4 All the resulting visualisations will be prepared to indicate other cumulative development in order that they may assist the cumulative assessment as well as the LVIA.
- 10.3.5 Whilst no two-dimensional image can fully represent the real viewing experience, the visualisation aims to provide a realistic representation of the onshore elements, based on current information and photomontage methodology.

Weather conditions

- 10.3.6 GLVIA3 para 8.22 state 'In preparing photomontages, weather conditions shown in the photographs should (with justification provided for the choice) be either:
 - representative of those generally prevailing in the area; or
 - taken in good visibility, seeking to represent a maximum visibility scenario when the development may be highly visible'.
- 10.3.7 In preparing photomontages for the LVIA, photographs will be taken in favourable weather conditions. Weather conditions shown in the photographs for all viewpoints have, where possible, will be taken during periods of 'very good' or 'excellent' visibility conditions, seeking to represent a maximum visibility scenario when the developments may be highly visible.

10.4 Methodology for production of visualisations

- 10.4.1 A photomontage is a visualisation which superimposes an image of a Project upon a photograph or series of photographs. Photomontage is a widespread and popular visualisation technique, which allows changes in views and visual amenity to be illustrated and assessed, within known views of the 'real' landscape.
- 10.4.2 To create the baseline panorama, the frames are individually cylindrically projected and then digitally joined to create a fully cylindrically projected panorama using Adobe Photoshop or PTGui software. This process avoids the wide-angle effect that would result should these frames be arranged in a perspective projection, whereby the image is not faceted to allow for the cylindrical nature of the full 360° view but appears essentially as a flat plane. Tonal alterations are made using Adobe software to create an even range of tones across the photographs once joined.
- 10.4.3 The photographs are also joined to create planar projection panoramas using PTGui software. These are used in the creation of the 53.5° field of view (FoV) photomontages. In some views, more than one 53.5° FoV panorama may be shown to accommodate the full width of the onshore elements of the Project.
- 10.4.4 Visualisations that illustrate the onshore elements of the Project, set within a computergenerated image of the landform will be used in the assessment to predict its theoretical appearance. This will be produced with a combination of Resoft WindFarm and 3D AutoCAD and will be based on a terrain model with a 2m data grid (2m Lidar data). There are limitations in the accuracy of DTM data so that landform may not be represented precisely and may result in differences in visibility, however, the use of 2m Lidar data minimises these limitations.
- 10.4.5 Rendering of the onshore substation in the photomontages is as photorealistic as possible to the conditions shown in each viewpoint photograph. There is some variation in the appearance and visibility between the viewpoints, as they are rendered to suit the conditions shown in each of the different viewpoint photographs, which have some unavoidable degree of variation in terms of lighting and weather conditions. The key requirement is that the onshore substation will be rendered with sufficient contrast against the skyline backdrop to illustrate its maximum visibility scenario in each image. Photomontages will be prepared to depict how the onshore substation would appear in excellent visibility conditions to illustrate the worst- case. The full suite of viewpoint photomontages should be viewed to gain an impression of the likely visual effects of the onshore substation.
- 10.4.6 Visualisations will be produced for the agreed viewpoints identified in the LVIA and photomontages will aim to provide a photorealistic image of the appearance of the onshore elements of the Project. 3D model representations are combined with the baseline view photographs to create a photorealistic rendered photomontage image of the development.
- 10.4.7 The baseline photographs and cumulative wireline visualisations shown for each viewpoint cover a 90° field of view (or in some cases, up to 360°), which accords with SNH guidance. These are cylindrically projected images and should be viewed flat at a comfortable arm's length.
- 10.4.8 The 53.5° field of view wirelines and photomontages are prepared using a planar projected image and should also be viewed flat at a comfortable arm's length. These images are each printed on paper 841 x 297mm (half A1) which provides for a relatively large-scale image.
- 10.4.9 Visualisations of the onshore elements of the Project will show, from each viewpoint, the existing baseline panorama and a wireframe or annotated panorama or photomontage.

- 10.4.10 The completed set of visualisations and accompanying data are then presented as figures using desktop publishing/graphic design software.
- 10.4.11 The photographs and other graphic material such as wirelines and photomontages used in this assessment are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.

10.5 Illustration of landscape planting strategy

10.5.1 Visualisations will be prepared to illustrate the landscape design strategy which is proposed as an embedded environmental measure within the onshore elements of the Project. This is likely to include landscaping illustrated in Year 1 (implementation) and at a later date during the establishment (between Years 5-15).

10.6 Limitations of visualisations

- 10.6.1 The photomontage visualisations used in the LVIA are for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye. The assessments are carried out from observations in the field and therefore may include elements that are not visible in the photographs.
- 10.6.2 The photomontage visualisations of the onshore substation (and any development proposal) have a number of limitations when using them to form a judgement on visual effect. These include:
 - a visualisation can never show exactly what a development will look like in reality due to factors such as: different lighting, weather and seasonal conditions which vary through time and the resolution of the image;
 - the images provided give a reasonable impression of the scale and the distance to the onshore elements of the Project, but can never be 100% accurate to the as constructed effect;
 - a static image cannot convey movement or reflection from the sun;
 - the viewpoints illustrated are representative of views in the area but cannot represent visibility at all locations;
 - to form the best impression of the effects, these images are best viewed at the viewpoint location shown;
 - the images must be printed and viewed at the correct size (841mm x 297mm);
 - images should be held flat at a comfortable arm's length. If viewing these images on a wall or board at an exhibition, stand at arm's length from the image presented to gain the best impression;
 - it is preferable to view printed images rather than view images on screen. Images on screen should be viewed using a normal PC screen with the image enlarged to the full screen height to give a realistic impression; and
 - there are practical limitations to shooting viewpoint photographs only in very good or excellent visibility and at particular times of day.

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Appendix 7.1A:

Climate Change Vulnerability Assessment

Contents

1. Climate Change Vulnerability Assessment

2

1. Climate Change Vulnerability Assessment

This Appendix contains the Climate Change Vulnerability Assessment which is the first stage of the Climate Change Resilience assessment described in **Section 7.1 Climate change resilience.** The Climate Change Vulnerability Assessment is used at Scoping to evaluate the vulnerability of the identified receptors to climate change across the Project lifetime. The vulnerability of the receptors will depend on the sensitivity and exposure of the receptors to the climate trends identified within the future baseline. The outcome of the scoping assessment will identify likely significant effects where there are receptors of 'medium' or 'high' vulnerability to climate impacts to be taken forward within the EIA Report. This will scope out any receptors considered of 'low' vulnerability.

Construction						
Climate trend	Receptor	Effect	Time period	Sensitivity	Exposure	Vulnerability
Onshore						
Increased annual mean temperatures, especially in the summer months, and an increase in the	Human health	Increased heat stress or heat exhaustion experienced by the construction workforce.	2030s	Μ	Μ	Medium Vulnerability
frequency and intensity of hot spells.	Building and infrastructure assets	Restriction of certain construction activities during hot weather, for example, the pouring of concrete in higher temperatures could reduce the strength and durability of the finished product, and the laying of asphalt could become difficult as it fails to maintain profile during compaction. This could	2030s	L	L	Low Vulnerability

Construction								
Climate trend	Receptor	Effect	Time period	Sensitivity	Exposure	Vulnerability		
		cause programme delay and increased costs.						
Increased annual mean temperatures and frequency and intensity of hot spells, coupled with decreased summer precipitation.	Human health	Increased dust creation from construction activities, leading to impacts on the health of construction workers and the failure of machinery and equipment.	2030s	L	L	Low Vulnerability		
	Human health	Risk of wildfires affecting the construction workforce.	2030s	Н	L	Low Vulnerability		
Decrease in summer precipitation leading to drought conditions	The natural environment	Drought conditions impacting water available to use during construction, e.g. for dust suppression.	2030s	L	L	Low Vulnerability		
Increase in precipitation resulting in tidal, fluvial or pluvial flooding	Human health	Wet weather leading to increased possibility of slips, trips and falls.	2030s	Μ	L	Low Vulnerability		
	Building and infrastructure assets	Flooding of construction site access roads causing delays to construction programme.	2030s	Μ	Μ	Medium Vulnerability		

Construction

Climate trend	Receptor	Effect	Time period	Sensitivity	Exposure	Vulnerability
	Building and infrastructure assets	Water ingress to equipment or machinery related to construction activities or permanent assets in place during construction, leading to equipment failures or damage.	2030s	Μ	Μ	Medium Vulnerability
	Building and infrastructure assets	Overwhelming of the construction site drainage system causing flooding across the site.	2030s	Μ	Μ	Medium Vulnerability
Increase in frequency and intensity of storm events.	Building and infrastructure assets	Increased risk of disruption to construction work, such as cranes being unable to operate in high winds.	2030s	Μ	Μ	Medium Vulnerability
Offshore						
Increased annual mean temperatures, especially in the summer months, and an increase in the frequency and intensity of hot spells.	Human health	Increased heat stress or heat exhaustion experienced by the construction workforce.	2030s	Μ	Μ	Medium Vulnerability
	Building and infrastructure assets	Restriction of certain construction activities during hot weather, for	2030s	L	L	Low Vulnerability

Construction						
Climate trend	Receptor	Effect	Time period	Sensitivity	Exposure	Vulnerability
		example, the pouring of concrete in higher temperatures could reduce the strength and durability of the finished product, and the laying of asphalt could become difficult as it fails to maintain profile during compaction. This could cause programme delay and increased costs.				
Increased frequency and intensity of storm events and wave heights	Human health	Extreme storminess leading to increased unsafe working environments and delays to construction programme.	2030s	Μ	Μ	Medium Vulnerability
	Building and infrastructure assets	There is an increased risk of disruption to construction work, such as cranes unable to operate in high winds.	2030s	Μ	Μ	Medium Vulnerability

			Time period	Sensitivity	Exposure	Vulnerability
Onshore						
Sea level rise	Building and infrastructure	Risk to the onshore infrastructure, such as substations, from coastal flooding and erosion.	2030s	М	Μ	Medium Vulnerability
			2050s	Н	н	High Vulnerability
			2070s	Н	н	High Vulnerability
Increase in precipitation resulting in tidal, fluvial or pluvial flooding	Building and infrastructure	Risk to the onshore infrastructure, such as substations, from river, surface water and groundwater flooding.	2030s	М	М	Medium Vulnerability
			2050s	Н	н	High Vulnerability
			2070s	Н	н	High Vulnerability
	Building and	Undermining tree roots	2030s	М	L	Low Vulnerability
	imastructure	faults due to falling trees.	2050s	М	L	Low Vulnerability
			2070s	М	L	Low Vulnerability
	Building and	Restriction of access	2030s	М	М	Medium Vulnerability
		preventing maintenance activities.	2050s	Μ	Μ	Medium Vulnerability
			2070s	Μ	Н	Medium Vulnerability

			Time period	Sensitivity	Exposure	Vulnerability
Fluctuations in mean rainfall across the year,	Building and infrastructure	Risk to subterranean and surface	2030s	L	М	Low Vulnerability
coupled with an increase in mean		infrastructure from subsidence, such as	2050s	L	Μ	Low Vulnerability
in changes to soil moisture.		cables and substations.	2070s	Μ	Н	Medium Vulnerability
Decrease in summer precipitation, leading to drought conditions.	Building and infrastructure	Changes in water content of soil has an adverse effect on soil resistivity and hence causes a reduction in cable ratings and the effectiveness of earthing systems at substations.	2030s	М	L	Low Vulnerability
			2050s	М	L	Low Vulnerability
			2070s	Μ	Μ	Medium Vulnerability
	Building and infrastructure	Drought conditions undermining tree roots leading to damage to infrastructure due to	2030s	L	L	Low Vulnerability
			2050s	L	L	Low Vulnerability
		falling trees.	2070s	L	Μ	Low Vulnerability
Increased annual mean temperatures,	Building and infrastructure	Reduction in the amount of power which can be	2030s	L	L	Low Vulnerability
especially in the summer months, and		transmitted and distributed.	2050s	Μ	Μ	Medium Vulnerability
an increase in the frequency and intensity			2070s	М	Μ	Medium Vulnerability
of hot spells.			2030s	Μ	L	Low Vulnerability

			Time period	Sensitivity	Exposure	Vulnerability
	Building and infrastructure	Overheating of mechanical and	2050s	М	М	Medium Vulnerability
		electrical (M&E) assets such as onshore substations, leading to a decrease in asset performance and rating and/or requiring additional electricity demand for mechanical cooling units.	2070s	Н	Μ	Medium Vulnerability
Human health	Increased heat stress or heat exhaustion	2030s	Μ	L	Low Vulnerability	
		experienced by the operational and maintenance workforce.	2050s	М	Μ	Medium Vulnerability
			2070s	Н	Н	High Vulnerability
	Building and infrastructure	Underground cable systems affected by the	2030s	L	L	Low Vulnerability
		increase in ground temperatures, reducing	2050s	М	L	Low Vulnerability
		cable ratings.	2070s	М	Μ	Medium Vulnerability
	Building and infrastructure	Extended growing season leading to	2030s	L	L	Low Vulnerability
	encroachment of vegetation in	2050s	L	L	Low Vulnerability	
		substations.	2070s	L	Μ	Low Vulnerability

			Time period	Sensitivity	Exposure	Vulnerability
Increased annual mean temperatures and	Building and infrastructure	Wildfire affecting electrical infrastructure.	2030s	М	L	Low Vulnerability
frequency and intensity of hot spells, coupled			2050s	М	L	Low Vulnerability
with decreased summer precipitation.			2070s	М	Μ	Medium Vulnerability
Low temperatures and Building and cold snaps could still infrastructure occur.	Building and	Cold weather leading to	2030s	М	Μ	Medium Vulnerability
	damage to the	2050s	М	L	Low Vulnerability	
		2070s	L	L	Low Vulnerability	
Increased frequency	Building and infrastructure	Lightning causing physical damage, fire, power surge, and shock wave at grid connection	2030s	М	L	Low Vulnerability
events.			2050s	М	L	Low Vulnerability
		points.	2070s	М	Μ	Medium Vulnerability
	Building and	Increased wind loading	2030s	L	L	Low Vulnerability
		and security fencing leading to damage.	2050s	L	L	Low Vulnerability
			2070s	М	Μ	Medium Vulnerability
	Human health	Wind blown debris leading to risk to maintenance personnel.	2030s	М	L	Low Vulnerability
			2050s	М	L	Low Vulnerability

			Time period	Sensitivity	Exposure	Vulnerability
			2070s	М	М	Medium Vulnerability
Offshore						
Increased frequency and intensity of storm events and wave heightsBuilding and 	Building and infrastructure	Destabilisation or degradation of Wind Turbine Generators mechanical systems and structures.	2030s	L	L	Low Vulnerability
			2050s	М	М	Medium Vulnerability
			2070s	М	М	Medium Vulnerability
	Building and	ilding and Loading and sediment transport across seabed	2030s	L	L	Low Vulnerability
	leading to loss of integrity of foundations	2050s	М	М	Medium Vulnerability	
		from scour and exposure.	2070s	М	М	Medium Vulnerability
	Building and	Loading and sediment	2030s	L	L	Low Vulnerability
	minastructure	leading to loss of integrity of cabling	2050s	М	М	Medium Vulnerability
		systems from scour and exposure.	2070s	М	М	Medium Vulnerability
	Building and infrastructure	Impeded access for	2030s	М	L	Low Vulnerability
		inspection.	2050s	М	М	Medium Vulnerability
			2070s	Μ	Μ	Medium Vulnerability

			Time period	Sensitivity	Exposure	Vulnerability
High temperatures	Building and infrastructure	Building and Overheating of mfrastructure mechanical and electrical (M&E) assets such as offshore	2030s	М	L	Low Vulnerability
electric such a substa decrea perforr and/or additio demar cooling			2050s	Μ	Μ	Medium Vulnerability
	substations, leading to a decrease in asset performance and rating and/or requiring additional electricity demand for mechanical cooling units.	2070s	Н	Μ	Medium Vulnerability	
Low temperatures	Building and infrastructure	Cold weather leading to ice accretion affecting the efficiency and performance of turbines.	2030s	М	М	Medium Vulnerability
			2050s	М	L	Low Vulnerability
			2070s	L	L	Low Vulnerability
Increase sea surface temperatures and	Building and infrastructure	Increased corrosion of the structures.	2030s	L	L	Low Vulnerability
ocean acidification			2050s	L	L	Low Vulnerability
			2070s	М	Μ	Medium Vulnerability

Decommissioning

			Time period	Sensitivity	Exposure	Vulnerability
Onshore			·			
Increased annual mean temperatures, especially in the summer months, and an increase in the frequency and intensity of hot spells.	Human health	Increased heat stress or heat exhaustion experienced by the workforce associated with decommissioning.	2090s	Η	Н	High Vulnerability
Increased annual mean temperatures and frequency and intensity of hot spells, coupled with decreased summer precipitation.	Human health	Increased dust creation from decommissioning activities, leading to impacts on the health of workers and the failure of machinery and equipment.	2090s	Μ	Μ	Medium Vulnerability
	Human health	Risk of wildfires affecting the workforce.	2090s	Н	Μ	Medium Vulnerability
Decrease in summer precipitation leading to drought conditions	The natural environment	Drought conditions impacting water available to use during decommissioning, e.g. for dust suppression.	2090s	Μ	Μ	Medium Vulnerability
Increase in precipitation resulting	Human health	Wet weather leading to increased possibility of slips, trips and falls.	2090s	Μ	Μ	Medium Vulnerability

Decommissioning

			Time period	Sensitivity	Exposure	Vulnerability
in tidal, fluvial or pluvial flooding.	Building and infrastructure assets	Flooding of the site access roads causing delays to decommissioning programme.	2090s	Μ	Н	Medium Vulnerability
	Building and infrastructure assets	Water ingress to equipment or machinery related to decommissioning activities, leading to equipment failures or damage.	2090s	Μ	Μ	Medium Vulnerability
	Building and infrastructure assets	Overwhelming of the site drainage system causing flooding across the site.	2090s	Μ	Μ	Medium Vulnerability
Increased in frequency and intensity of storm events.	Building and infrastructure assets	There is an increased risk of disruption to decommissioning work, such as cranes unable to operate in high winds.	2090s	Μ	Н	Medium Vulnerability
Offshore						
Increased annual mean temperatures, especially in the summer months, and an increase in the frequency and intensity of hot spells.	Human health	Increased heat stress or heat exhaustion experienced by the workforce associated with decommissioning.	2090s	Н	Η	High Vulnerability

Decommissioning

			Time period	Sensitivity	Exposure	Vulnerability
Increased frequency and intensity of storm events and wave heights	Human health	Extreme storminess leading to increased unsafe working environments and delays to decommissioning programme.	2090s	Μ	Μ	Medium Vulnerability
	Building and infrastructure assets	There is an increased risk of disruption to decommissioning work, such as cranes unable to operate in high winds.	2090s	Μ	Н	Medium Vulnerability

MarramWind

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