MachairWind Offshore Windfarm

Chapter 15 Military and Civil Aviation

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GLOSSARY OF ACRONYMS

Term	Definition
AARA	An Air-to-Air Refuelling Area
AD	Air Defence
ANO	Air Navigation Order
AIP	Aeronautical Information Publication
AMA	Area Minimum Altitude
amsl	above mean sea level
APDO	Approved Procedure Design Organisation
ATC	Air Traffic Control
ATS	Air Traffic Service
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CES	Crown Estate Scotland
DA	Danger Area
DGC	Defence Geographic Centre
EEA	European Economic Area
EEZ	Exclusive Economic Zone
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ERCoP	Emergency Response and Cooperation Plan
FIR	Flight Information Region
FL	Flight Level
ft	feet
HAT	highest astronomical tide
HIAL	Highlands and Islands Airports Limited
HND	Holistic Network Design
IAC	Inter-array cable
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
INTOG	Innovation and Targeted Oil & Gas
km	kilometres

Term	Definition
LFA	Low Flying Area
LMP	Lighting and Marking Plan
LSE	likely significant effect
m	metre
MCA	Maritime and Coastguard Agency
MD-LOT	Marine Directorate Licensing and Operations Team
MGN	Marine Guidance Note
MoD	Ministry of Defence
MSA	Minimum Sector Altitude
NATS	National Air Traffic Services
NERL	NATS (En-Route) plc
NLB	Northern Lighthouse Board
nm	nautical mile
NOTAM	Notice to Aviation
O&M	Operation and Maintenance
Ofcom	Office of Communications
OnTDA	Onshore Transmission Development Area
OREI	Offshore Renewable Energy Installation
OSP	Offshore Substation Platform
PDE	Project Design Envelope
PSR	Primary Surveillance Radar
RLoS	radar line of sight
RRH	Remote Radar Head
SAR	Search and Rescue
SSR	Secondary Surveillance Radar
TMZ	Transponder Mandatory Zone
TOPA	technical and operational assessment
UK	United Kingdom
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
WDA	Windfarm Development Area
WTG	wind turbine generator

GLOSSARY OF TERMS

Term	Definition
Collision	The act or process of two moving objects colliding.
Combined Assessment	A whole-Project assessment considering interactions between the Windfarm Development Area, Offshore Export Cable Corridor and Onshore Transmission Development Area (i.e. considering impact interactions and additive effects to determine if any effects would be materially elevated from those assessed for the Windfarm Development Area-alone assessment). Due to long delays in securing confirmation of the Project's grid connection location, the level of detail available for the Offshore Export Cable Corridor and Onshore Transmission Development Area is limited and therefore the assessment is commensurate with the level of detail available at the time of carrying out the assessment. When it is time to progress the Offshore Export Cable Corridor and Onshore Transmission Development Area consent applications, their respective scoping and Environmental Impact Assessment Report / Environmental Report will take account of all likely effects predicted within the WDA EIA and present updated combined assessments using the latest available information covering all aspects of the Project.
Controlled airspace	Defined airspace within which pilots must follow Air Traffic Control instructions implicitly. In the UK, Classes A, C, D, and E are areas of controlled airspace.
Cumulative Effects Assessment	Assessment of likely significant effects resulting from the incremental change caused by other past, present and reasonably foreseeable projects / activities together with the Project. This is separate to combined effects arising between the Project's separate Development Areas.
Development Area	Application boundary for consenting purposes which, for the Project, consists of a Windfarm Development Area, Offshore Export Cable Corridor, and Onshore Transmission Development Area. Separate consent and marine licence applications will be submitted for each Development Area where applicable.
Embedded mitigation measure	Mitigation measures, including industry good practice measures, that are directly incorporated into the design for the MachairWind Windfarm Development Area to avoid or reduce environmental effects.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed development over and above the existing circumstances (or 'baseline').
Environmental Impact Assessment (EIA) Regulations	A collective term referring to The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017.
Flight Information Region	Airspace managed by a controlling authority with responsibility for ensuring air traffic services are provided to aircraft flying within it.
Flight Level	An aircraft altitude expressed in hundreds of feet at a standard sea level pressure datum of 1013.25 hectopascals.
Highest astronomical tide	The highest level that can be expected to occur under average meteorological conditions and under any combination of astronomical conditions.
Inter-array cables (IACs)	Armoured cable containing electrical and fibre optic cores which link the wind turbine generators to each other and to the offshore substation platform(s).
Instrument Flight Procedure	A detailed, pre-defined set of instructions that pilots use to navigate an aircraft, primarily relying on instruments rather than visual references, especially in conditions where visibility is limited.

Term	Definition
Instrument Flight Rules	IFR are rules which allow properly equipped aircraft to be flown under IMC.
Instrument Meteorological Conditions	IMC are meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for Visual Meteorological Conditions (VMC).
Landfall	The area from Mean Low Water Springs to a transition bay(s), where the offshore export cable(s) come ashore.
MachairWind Offshore Windfarm	An offshore windfarm capable of exporting around 2 GW of renewable energy to the National Electricity Transmission System. MachairWind Offshore Windfarm comprises three Development Areas: • The WDA – located on the west coast of Scotland to the northwest of Islay and west of Colonsay; • The Offshore Export Cable Corridor – a preliminary boundary extending from the WDA to mean high water springs at a landfall location near Girvan, South Ayrshire; and • The Onshore Transmission Development Area – a preliminary boundary which extends landward from mean low water springs and includes the land required for the landfall of the offshore export cables and their route up to but not including the proposed high voltage direct current switching station which will be developed and constructed by Transmission Owner, ScottishPower Transmission. Separate consent and licence applications will be submitted for each Development Area.
Mean sea level	The average level of the sea taking account of all tidal effects but excluding surge events.
National Electricity Transmission System	The high-voltage electricity power transmission network serving Great Britain which receives electricity from generators (such as offshore windfarms) and transmits that electricity to anywhere on the National Electricity Transmission System to satisfy demand.
Offshore export cable	Armoured cable containing electrical cores between the offshore substation platform(s) and landfall. Offshore export cables will include bundled fibre optic cables. The offshore export cables are subject to Marine Licence applications under the Marine (Scotland) Act 2010. The portion of the offshore export cable(s) located within the WDA is assessed as part of this MachairWind WDA EIA and a marine licence application to construct, alter or improve this portion has been submitted alongside the WDA application. A separate marine licence application will be submitted for the portion of the offshore export cable(s) from the WDA boundary to mean high water Mean High Water Springs.
Offshore Export Cable Corridor (ECC)	The preliminary boundary extending from the WDA to mean high water springs near Girvan, South Ayrshire and within which the offshore export cable(s) will be located. A separate marine licence application will be submitted for the offshore export cable(s) located within the Offshore ECC.
Offshore Substation Platform (OSP)	An offshore platform with a fixed foundation located within the WDA which houses electrical equipment such as transformers, switchgear, protection and control systems, and enables the windfarm's renewable electricity to be collected via inter-array cables and exported to the National Electricity Transmission System via offshore export cables.
Offshore Substation Platform (OSP) link cables	Electrical cables which link OSPs (if more than one OSP is required). These cables will include fibre optic cores or bundled fibre optic cables. OSP link cables will be wholly located within the WDA.
Onshore Transmission Development Area (OnTDA)	The preliminary boundary which extends landward from mean low water springs and includes the land required for the landfall of the offshore export cables and their route up to but not including the proposed high voltage direct current switching station which will be developed and constructed by Transmission Owner, ScottishPower Transmission. This Transmission Owner is responsible for consenting the high voltage direct current switching station. Onward connections to the National Electricity Transmission System will be

Term	Definition
	consented by National Grid Electricity Transmission and ScottishPower Transmission. Where relevant, these are considered as part of cumulative effects assessment in the EIA.
Operational life	The operational life is the expected length of time from final commissioning of the WDA until the cessation of commercial operations. This is anticipated to be 35 years.
Pre-construction works	Pre-construction works are activities undertaken prior to formal commencement of construction. Examples include survey works such as geotechnical and geophysical surveys and seabed preparation activities.
Primary Surveillance Radar	A radar system that measures the bearing and distance of targets using the detected reflections of radio signals.
Radar	Radar is the commonly accepted noun that is the abbreviation of Radio Detection and Ranging. It is a system of radio waves used to detect the presence and movement of aircraft, maritime vessels, and other moving objects and surface features.
Rochdale Envelope	An approach to environmental assessment which aims to take account of the need for flexibility in the future evolution of the detailed project proposal. The approach is named after two court rulings concerning outline planning applications for a proposed business park in Rochdale.
Safety zones	An area of water around or adjacent to a wind turbine generator or Offshore Substation Platform and associated substructure which is to be constructed, extended, operated or decommissioned, from which certain or all classes of vessels are excluded and within which activities can be regulated for the purpose of securing safety of the wind turbine generator, substructure or vessels in that vicinity, and individuals on both the wind turbine generator, substructure or vessel, in line with Section 95 of the Energy Act 2004.
Scottish Marine Area	The area of Scotland's territorial sea limit (up to 12 nautical miles from baseline) as defined in the Marine (Scotland) Act 2010.
ScotWind	A Crown Estate Scotland seabed leasing round which enabled developers to propose offshore wind projects and apply for seabed rights to plan and build windfarms in Scottish waters.
Secondary Surveillance Radar	A radar system that transmits interrogation pulses and receives transmitted responses from suitably equipped targets.
The Applicant	The legal entity submitting consent applications for the MachairWind Offshore Windfarm, namely MachairWind Limited.
The Lighthouse	The Dubh Artach lighthouse.
The Project	MachairWind Offshore Windfarm including all its Development Areas and associated infrastructure.
Uncontrolled Airspace	Defined airspace in which ATC does not exercise exclusive authority but may provide basic information services to aircraft in radio contact. In the UK, Class G is uncontrolled airspace.
Visual Flight Rules	VFR are the rules that govern the operation of aircraft in Visual Meteorological Conditions (VMC), conditions in which flight solely by visual reference is possible.
Visual Meteorological Conditions	VMC are the meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.
Windfarm Development Area (WDA)	The application boundary within the OAA where consent will be sought for the proposed WDA infrastructure. The WDA infrastructure is subject to Section 36 consent and marine licence applications (generation and transmission) which are being applied for separately from the Offshore ECC infrastructure and OnTDA infrastructure.

Term	Definition
WDA infrastructure	The offshore generation and transmission infrastructure located within the WDA including but not limited to: WTGs, WTG fixed foundations (and associated scour protection), OSP(s), OSP fixed foundations (and associated scour protection), IACs, OSP link and offshore export cable(s) and their associated external cable protection (insofar as these are located within the WDA) and fibre optic cables.
WDA restricted build area	Refers to the area within the WDA which is considered unsuitable for the installation of WTG and OSP foundations for engineering and environmental reasons.
Wind Turbine Generator (WTG)	A wind turbine generator which converts wind energy into electrical energy. Each wind turbine generator is a complex system composed of a high number of components. Typically, the main components include the rotor assembly (composed of three blades and a hub); the nacelle (containing a generator, shaft and gearbox, power electronic converter and transformer); and the tower (containing lifting equipment and the switchgear).

15 MILITARY AND CIVIL AVIATION

15.1 INTRODUCTION

1. This chapter presents an assessment of potential impacts and likely significant effects (LSE) on military and civil aviation that may arise from the construction, operation and maintenance (O&M), and decommissioning of the MachairWind Windfarm Development Area (WDA) infrastructure.

2. Due to delays stemming from the National Electricity System Operator's 2022 Holistic Network Design (HND) process, the grid connection location for the Project was confirmed in August 2025 to be in the vicinity of Girvan, South Ayrshire. As a result of these delays, this topic chapter considers the WDA Study Area and existing environment only. A combined assessment of the construction, O&M and decommissioning of the WDA activities, Offshore Export Cable Corridor (ECC) and Onshore Transmission Development Area (OnTDA) activities (commensurate with the level of detail that is available at the time of carrying out that assessment) is also provided. This approach ensures a holistic view is taken of the entire Project. As noted in **Chapter 1 Introduction**, the assessment of potential effects on all receptors associated with the Offshore ECC and OnTDA will be presented in individual Environmental Impact Assessment Report (EIARs), which will be submitted separately in accordance with the relevant EIA Regulations.

3. This chapter considers the following WDA infrastructure: wind turbine generators (WTGs), Offshore Substation Platforms (OSP) and associated fixed foundations and scour protection, inter-array cables, OSP link cables, the portion of the offshore export cable located within the WDA and associated cable protection.

4. This chapter has been prepared to provide the Marine Directorate Licensing and Operations Team (MD-LOT) (on behalf of the Scottish Ministers) and stakeholders with sufficient information to determine the likely significant effect(s) of the Project on the receiving environment.

5. This chapter should be read in conjunction with the following related EIAR chapters:

   - **Chapter 13 Shipping and Navigation** – considers the potential impact of WDA infrastructure on access for Search and Rescue (SAR) assets; and
   - **Chapter 17 Infrastructure and Other Marine Users** – considers potential impacts on Ministry of Defence (MoD) maritime navigational interests.

6. Key inter-relationships between this chapter and those listed above will be considered where relevant and presented in this chapter.

7. Additional information to support the military and civil aviation assessment includes:

   - **Appendix 15.1 Airspace Analysis and Radar Modelling** – identifies the radars liable to detect WTGs within the WDA, provides details of radar line of sight (RLoS) analyses, sets out a detailed analysis of the airspace occupied by the WDA and outlines the effects that the Project is likely to have on aviation activities in the vicinity; and
   - **Appendix 15.2 Dubh Artach Lighthouse Technical Note** – assesses the impact of the Project on safe marine and helicopter operations associated with the Dubh Artach and Skerryvore Lighthouses.

8. This chapter was prepared by Cyrrus Limited.

15.2 LEGISLATION, POLICY AND GUIDANCE

9. The overarching policy and legislation relevant to the EIA is described in **Chapter 2 Policy and Legislative Context**. **Table 15.1** sets out the relevant legislation, policy and guidance that informs the assessment for military and civil aviation.

Table 15.1 Summary of relevant legislation, policy and guidance for military and civil aviation

Relevant Policy or Guidance	Relevance to the Assessment
Legislation	
Air Navigation Order (ANO) 2016/765 (Civil Aviation Authority (CAAa), 2022)	The ANO implements the UK's obligations under the Chicago Convention on International Civil Aviation and regulates aspects of aviation safety. It provides regulatory and enforcement powers for the CAA needed in respect of retained safety legislation. ANO Article 222 details the requirements for the lighting of en-route obstacles that are 150 m or more above ground level. ANO Article 223 modifies the requirements of Article 222 with respect to WTGs in UK territorial waters of 60 m or more above the level of the sea at the highest astronomical tide. The WDA is within UK territorial waters. Article 225A details the requirements for notifying the CAA of any planned works to erect new en-route obstacles that are 100 m or more above sea level.
Policy	
Scotland's National Marine Plan (Scottish Government, 2015)	Marine planning policy DEFENCE 1 states that to maintain operational effectiveness in Scottish waters used by the armed services, development and use will be managed in these areas: • Naval areas including bases and ports; • Firing Danger Areas; • Exercise Areas; and • Communications. and that proposals for development and use should be discussed with the MoD at an early stage in the process.
Civil Aviation Publication (CAP) 764: Policy and Guidelines on Wind Turbines (CAA, 2025a)	CAP 764 details the CAA policy and guidelines associated with WTG impacts on aviation that aviation stakeholders and wind energy developers need to consider when assessing a development's viability.
National Planning Framework 4 (Scottish Government, 2023)	The Energy policy (Policy 11) states that project design and mitigation will demonstrate how impacts on aviation and defence interests are addressed.
Guidance	
CAP 670: Air Traffic Services Safety Requirements (CAA, 2019)	CAP 670 sets out the safety regulatory framework and highlights the requirements to be met by providers of civil air traffic services (ATS) and other services in the UK to ensure that those services are safe for use by aircraft.
CAP 738: Safeguarding of Aerodromes (CAA, 2020)	CAP 738 offers guidance to help assess what impact a proposed development or construction might have on an aerodrome or technical site.

Relevant Policy or Guidance	Relevance to the Assessment
CAP 774: UK Flight Information Services (CAA, 2021)	CAP 774 details the ATS provided in uncontrolled airspace within the UK Flight Information Region (FIR).
Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (MCA, 2021)	MGN 654 highlights issues to consider when assessing navigational safety and emergency response, caused by OREI developments.
MoD Obstruction Lighting Guidance (MoD, 2020)	The guidance includes details of MoD requirements for the lighting of offshore developments.
CAP 168: Licensing of Aerodromes (CAA, 2025b)	CAP 168 sets out the standards required at UK licensed aerodromes relating to management systems, operational procedures, physical characteristics, assessment and treatment of obstacles and visual aids.
CAP 785B: Implementation and Safeguarding of Instrument Flight Procedures (IFPs) in the UK (CAA, 2022b)	CAP 785B includes details of the IFP safeguarding process. IFPs are pre-defined, published routes for aircraft to follow for safe and efficient operations when visual navigation is not possible. These procedures include departure, arrival and approach procedures based on ground-based navigation aids or Global Positioning System.
CAP 437: Standards for Offshore Helicopter Landing Areas (CAA, 2026)	CAP 437 provides the criteria applied by the CAA in assessing offshore helicopter landing areas for worldwide use by helicopters registered in the UK and includes winching area ‘best practice’ design criteria for wind turbine platforms.
OREIs: Requirements, Guidance and Operational Considerations for SAR and Emergency Response (MGN 654 Annex 5) (MCA, 2024)	The document provides a description of MCA policy, and guidance, advice and specific requirements to assist and enable SAR operations to, within and in the vicinity of offshore renewable energy developments.
CAP 1616: Airspace Change Process (CAA, 2025c)	CAP 1616 explains the airspace change process for making a permanent change to the notified airspace design.
CAP 032: UK Aeronautical Information Publication (AIP) (CAA, 2025d)	The UK AIP is the main resource for information on facilities, services and flight procedures at all licensed UK airports, as well as UK airspace rules, regulations and restrictions, en-route procedures, charts and other air navigation information.
UK Military AIP (MoD, 2025)	The UK Military AIP is the main resource for information and flight procedures at military aerodromes.

15.3 CONSULTATION

10. This military and civil aviation chapter has been informed by engagement with stakeholders, including those listed below:

- Highlands and Islands Airports Limited (HIAL);
- MD-LOT;
- MoD;
- National Air Traffic Services (NATS); and
- Northern Lighthouse Board (NLB).

11. As part of the consultation process, the Applicant presented the approach to assessment to stakeholders to offer transparency around the scoping methodology and rationale, capture stakeholder advice and guidance, and incorporate stakeholder feedback, where appropriate. A summary of the approach to stakeholder communication and consultation is outlined in **Chapter 6 Consultation and Stakeholder Engagement**.

12. The consultation outcomes in relation to military and civil aviation are outlined in **Table 15.2**, which summarises stakeholder feedback, outlines how the Applicant has responded to the feedback received, and details how it has been considered within this chapter.

Table 15.2 Summary of consultation relevant to military and civil aviation

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
Pre-Scoping Opinion				
1.	MoD	17 November 2022 Email correspondence	MoD requested various dimensions and parameters for assessment purposes after being contacted by the Applicant.	Requested dimensions and parameters were provided.
Scoping Opinion				
2.	Argyll and Bute Council	03 December 2024 Scoping Opinion	The Council understands that advice from relevant consultees with expertise in this field will be sought in this regard.	Noted.
3.	HIAL	19 November 2024 Scoping Opinion	We have reviewed the above application, and the proposed development location sits within the Minimum Sector Altitude (MSA) for Islay and Tiree Airport, therefore it may conflict with our Instrument Flight Procedures. We would need the exact co-ordinates (Eastings and Northings) and height for each wind turbine to carry out an accurate initial Safeguarding Assessment. Please note, that we would also require aviation lighting on each of the turbines (for further information please refer to Advice Note 2 'Lighting' (available at http://www.aoa.org.uk/policy-campaigns/operations-safety). Please also consider the lighting requirements as documented in The Air Navigation Order 2016, Article 222) and a construction management strategy. This should include details of the construction of wind turbines onshore and a turbine route map from onshore to the offshore location.	Potential impacts on Islay Airport and Tiree Airport IFPs are assessed in **Sections 15.11** and **15.12**. Coordinates and WTG tip heights were shared with HIAL via email on 19 August 2025. The development of and adherence to a Lighting and Marking Plan (LMP) is an embedded mitigation measure (M-20) as detailed in **Section 15.9**. As discussed with HIAL during a meeting held on 16 February 2026, the Project will utilise bottom-fixed foundations only, all WTGs will be assembled in situ and not towed from shore. Any installation vessels and equipment will not exceed the height of the maximum blade tip height as detailed in Table 3.13 of **Chapter 3 Project Description**. Cranes and installation vessels on

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
				site will utilise the appropriate lights and identification systems in line with the Civil Aviation Authority approved regulations at the time of construction.
4.	MD-LOT	09 January 2025 Scoping Opinion	The Scottish Ministers are broadly content with the study area identified in Section 15.6 of the Scoping Report.	Noted.
5.	MD-LOT	09 January 2025 Scoping Opinion	In Table 15.4 of the Scoping Report the Developer summarises the potential impacts to Military and Civil Aviation during the different phases of the Proposed Development. The Scottish Ministers largely agree with the impacts scoped in to and out of the EIA Report however highlight the MOD representation in relation to military low flying training, defence maritime training and operational interests for consideration.	Potential impacts on military low flying training are considered in **Sections 15.11**, **15.12** and **15.14**.
6.	MD-LOT	09 January 2025 Scoping Opinion	The Scottish Ministers highlight the HIAL representation stating that the Proposed Development location sits within the Minimum Sector Altitude for Islay and Tiree Airport and may conflict with Instrument Flight Procedures. The Scottish Ministers recommend the Developer engage further with HIAL on these points and advise that these impacts must be assessed, and appropriate mitigation proposed, in the EIA Report.	Potential impacts on Islay Airport and Tiree Airport IFPs are assessed in **Sections 15.11** and **15.12**. Consultation is ongoing with HIAL. Mitigation is proposed in **Section 15.11.1.1.3.3**.
7.	MD-LOT	09 January 2025 Scoping Opinion	The developer should consider the lighting requirements and a construction management strategy as suggested in the Highlands and Islands Airports Limited representation. The Scottish Ministers flag the Advice Note 2 'Lighting' in HIAL's representation for further information.	The development of and adherence to a LMP is an embedded mitigation measure (M-20) as detailed in **Section 15.9**.
8.	MD-LOT	09 January 2025 Scoping Opinion	The Scottish Ministers highlight the NLB representation that aircraft operate to Dubh Artach throughout the year to oversee key operations. The Scottish Ministers also flag the conflict of major refurbishment works on Dubh Artach lighthouse and nearby Skerryvore lighthouse from 2027 until 2032 which will involve high	**Appendix 15.2 Dubh Artach Lighthouse Technical Note** assesses the impact of the Project on safe marine and helicopter operations associated with the Dubh

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
			levels of helicopter visits to the area. It is recommended that the developer communicates with the NLB to identify safe limits for aviation operations in this area.	Artach and Skerryvore Lighthouses. The WDA boundary has been refined to accommodate the NLB requested setback distance between the helipad at Dubh Artach and the WDA. Potential impacts on lighthouse helicopter operations are assessed in **Section 15.11**.
9.	MD-LOT	09 January 2025 Scoping Opinion	The Scottish Ministers highlight the representation from NATS which predicts that the Proposed Development is likely to generate false primary plots and also a reduction in the probability of Tiree RADAR to detect real aircraft. NATS has also advised that the Proposed Development will likely have unacceptable impacts to Prestwick Centre Air Traffic Control. The Scottish Ministers therefore recommend the Developer engage further with NATS on these points and advise that these impacts must be assessed, and appropriate mitigation proposed, in the EIA Report.	Impacts on Tiree radar are assessed in **Sections 15.11**, **15.12** and **15.14**. A technical mitigation solution has been proposed by NATS and agreed with the MoD. The mitigation is to replace Tiree radar with a new generation Indra radar which includes technology for removing the interference caused by WTGs. The mitigation will be agreed between the Applicant and NATS in the form of a Statement of Common Understanding. The Applicant has engaged with NATS and have a draft Contract For Sale Of Consultancy Services In Relation To Wind Turbines At MachairWind Offshore Windfarm which The Applicant is negotiating, but both parties are in agreement on material terms..

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
10.	MD-LOT	09 January 2025 Scoping Opinion	The Scottish Ministers, in line with MOD representation, notes that the proposed development occupies Low Fly Area 14. With regards to air safety, the Scottish Ministers advise that the MOD accredited aviation safety lighting in accordance with Civil Aviation Authority Air Navigation Order 2016 is considered in the EIA Report.	Potential impacts on military low flying training are considered in **Sections 15.11**, **15.12** and **15.14**. The development of and adherence to a LMP is an embedded mitigation measure (M-20) as detailed in **Section 15.9**.
11.	MoD	21 November 2024 Scoping Opinion	I write to confirm the safeguarding position of the MOD on information that should be taken into account in the preparation of an Environmental Statement and any associated application(s). This response is based on the Windfarm Development Area Scoping Report dated September 2024 (Document Reference. MCW-GEN-PMG-REP-IBR-000068, Rev 1). This recognises some of the principal defence issues that will be of relevance to the progression of the proposed development.	Noted.
12.	MoD	21 November 2024 Scoping Opinion	The wind farm development area (WDA) is located within Low Flying Area (LFA) 14 of the UK Military Low Flying System in which military aircraft may engage in low level flying activities. Military aviation has been considered in the scoping report at section 15.7.2. This appropriately identifies and considers different types of designated airspace assigned for defence activities. As part of this evaluation, the potential for the proposed wind farm to create a physical obstruction hazard to military low flying training activities that may be conducted in this area has not been specifically identified. However, at section 15.7.1, the applicant has identified that the airspace above the WDA is class G, uncontrolled airspace, up to approximately 19,500 feet above mean sea level and that this airspace is predominantly used for low level flying operations. The potential for the proposed development to create physical obstructions to low flying aircrafts identified as a matter that needs to be scoped in in relation to all stages of the life of the proposed development (ref. section15.9 - table 15.4). It is noted that embedded mitigation has been	Potential impacts on military low flying training are considered in **Sections 15.11**, **15.12** and **15.14**. The development of and adherence to a LMP is an embedded mitigation measure (M-20) as detailed in **Section 15.9**.

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
			identified which includes the provision of a lighting and marking plan which will include the provision of aviation warning lighting (ref. sections15.8 - table 15.3 and section 20.8 – table 20.3). The submission identifies that aviation lighting and marking will be installed in accordance with Article 223 of the United Kingdom (UK) Air Navigation Order 2016. In addition to this, the applicant should recognise that aviation lighting will need to also address MOD aviation lighting requirements which may differ to those required to meet civil standards.	
13.	NATS	November 2024 Scoping Opinion	NATS en-route plc is responsible for the safe and expeditious movement in the en-route phase of flight for aircraft operating in controlled airspace in the UK. To undertake this responsibility, it has a comprehensive infrastructure of RADAR's, communication systems and navigational aids throughout the UK, all of which could be compromised by the establishment of a wind farm. In this respect NATS is responsible for safeguarding this infrastructure to ensure its integrity to provide the required services to Air Traffic Control (ATC). In order to discharge this responsibility NATS is a statutory consultee for all wind farm applications, and as such assesses the potential impact of every proposed development in the UK. The technical assessment sections of this document define the assessments carried out against the development proposed in section 3.	Noted.
14.	NATS	November 2024 Scoping Opinion	Scottish Government submitted a request for a NATS technical and operational assessment (TOPA) for the development at MachairWind (ScotWind W1) Wind Farm. It will comprise turbines as detailed in Table 1 and contained within an area as shown in the diagrams contained in Appendix B.	Noted.
15.	NATS	November 2024 Scoping Opinion	The proposed development falls within the assessment area of the following systems: En-route Surv – Great Dun Fell Radar, Lowther Hill Radar, Perwinnes Radar, Tiree Radar.	Noted. The radars at Great Dun Fell, Lowther Hill and Perwinnes would not have RLoS of WTGs within the WDA due to the distance between the radars and the WDA and

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
			En-route Nav – None. En-route AGA – None.	intervening terrain and therefore the subsequent NATS responses are only concerned with the predicted impact on Tiree radar.
16.	NATS	November 2024 Scoping Opinion	Predicted Impact on Tiree RADAR: Using the theory as described in Appendix A and development specific propagation profile it has been determined that the terrain screening available will not adequately attenuate the signal, and therefore this development is likely to cause false primary plots to be generated. A reduction in the RADAR's probability of detection, for real aircraft, is also anticipated.	Impacts on Tiree radar are assessed in **Sections 15.11**, **15.12** and **15.14**. A technical mitigation solution has been proposed by NATS, as detailed under ID 29.
17.	NATS	November 2024 Scoping Opinion	Where an assessment reveals a technical impact on a specific NATS' RADAR, the users of that RADAR are consulted to ascertain whether the anticipated impact is acceptable to their operations or not. Prestwick Centre ATC – Unacceptable. Military ATC – Acceptable.	The impact on users of Tiree radar is assessed in **Section 15.11**. A technical mitigation solution has been proposed by NATS, as detailed under ID 29.
18.	NATS	November 2024 Scoping Opinion	No impact is anticipated on NATS' navigation aids.	Noted.
19.	NATS	November 2024 Scoping Opinion	No impact is anticipated on NATS' radio communications infrastructure.	Noted.
20.	NATS	November 2024 Scoping Opinion	The proposed development has been examined by technical and operational safeguarding teams. A technical impact is anticipated, this has been deemed to be unacceptable.	A technical mitigation solution has been proposed by NATS, as detailed under ID 29.
21.	NLB	04 November 2024 Scoping Opinion	Northern Lighthouse Board note the inclusion of Dubh Artach Lighthouse as a key receptor in a number of other sections within the report, including Chapter 14 (Offshore Archaeology & Cultural Heritage) and Chapter 15 (Military & Civil Aviation). These	Noted.

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
			acknowledge both the historic nature of the NLB lighthouse, and also an ongoing operational requirement to maintain and operate it as an Aid to Navigation that is considered critical to the safety of navigation in the area. NLB welcome the intention to include these impacts within the EIA document.	
22.	NLB	04 November 2024 Scoping Opinion	In short Northern Lighthouse Board's contract aircraft operate to Dubh Artach all year round subject to weather conditions. Approaches and departures occur from all directions. Under slinging operations from our vessel NLV Pharos also are carried out with the vessel positioning relatively close to the lighthouse as best suits the wind and sea state at the time. Safe helicopter and vessel operating areas to facilitate these operations are required.	Potential impacts on lighthouse helicopter operations are assessed in **Section 15.11**.
23.	NLB	04 November 2024 Scoping Opinion	Northern Lighthouse Board are scheduled to conduct major refurbishment projects on both Dubh Artach lighthouse, and nearby Skerryvore lighthouse, from 2027 through until 2032, and these works will utilise a large number of helicopter flights and ship visits to this area. These operations may coincide with the construction phase of the MachairWind project, and the need to define the safe limits for aviation and vessel operations in this area for both projects should be considered at an early stage. NLB is willing to engage with the project to deconflict aviation and maritime operations should any overlap occur.	**Appendix 15.2 Dubh Artach Lighthouse Technical Note** assesses the impact of the Project on safe marine and helicopter operations associated with the Dubh Artach and Skerryvore Lighthouses. The WDA boundary has been refined to accommodate the NLB requested setback distance between the helipad at Dubh Artach and the WDA.
Post-Scoping Opinion				
24.	HIAL	16 April 2025 Online meeting	A Project overview was presented to HIAL along with initial findings regarding potential impacts to IFPs at Tiree Airport and Islay Airport. HIAL stated that the IFPs are currently undergoing five yearly reviews and agreed to supply the necessary survey data to enable formal IFP assessments to be undertaken.	Potential impacts on Islay Airport and Tiree Airport IFPs are assessed in **Sections 15.11** and **15.12**. Further engagement with HIAL is ongoing to agree suitable revisions to the Islay and Tiree Airport IFPs in

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
				order to resolve obstacle infringements.
25.	HIAL	04 November 2025 Email correspondence	An initial aeronautical safeguarding assessment was undertaken to determine if the proposed turbines may impact upon the IFPs at Tiree (TRE) and Islay (ILY) airports. A number of targets were assessed to include the closest and furthest from each aerodrome along with additional turbines to see the limits of where impacts were identified. Tiree (TRE): Of the nine turbines assessed, four (Turbines 2, 6, 38, and 47) were found to potentially impact RW05's TAA. (CS_RW05_TAA_C_157) The remaining five turbines (57, 58, 72, 78, and 88) indicated there was no impact. (Turbine 58 lies outside the assessment criteria for TRE). Islay (ILY): All nine turbines assessed were found to be potentially impacting Runway 12's TAA (CS_RW12_RNP_TAA_C_279). Impacts occurred across the full boundary extent, with both the closest and furthest turbines from the aerodrome producing potential infringements of the RNP approach. If this assessment were being undertaken as part of a Scoping Consultation/Section 37 Response, HIAL would submit a holding objection to the application with the requirement an Aerodrome Impact Feasibility Study (AIFS) was undertaken for each aerodrome. This would require an IFP Impact/Safeguarding Assessment by an APDO for the submitted development. Additionally, as part of the AIFS, a Construction Management Strategy (Details of the construction of the Wind Turbines onshore & Turbine route map from onshore to the offshore location) along with an Aerodrome Lighting Scheme would be required.	Potential impacts on Islay Airport and Tiree Airport IFPs are assessed in **Sections 15.11** and **15.12**. The Applicant has engaged with an APDO and IFP Impact Assessments for Tiree and Islay airports have been completed. The development of and adherence to an LMP is an embedded mitigation measure (M-20) as detailed in **Section 15.9**. MachairWind is an offshore windfarm with bottom fixed foundations, rather than floating. All turbines will be assembled in situ at the WDA itself, rather than assembled at port and towed to location.

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
			As per CAP 785, the IFP Impact Assessment must be produced by an Approved Procedure Design Organisation (APDO). The IFP Impact Assessment should consider both: • The currently published procedures, as available in the UK AIP, and • The Discrete IFPs applicable to Tiree, and Islay. (Discrete IFPs are available from this office upon request). As potential impacts have been identified, it would be prudent to engage with an APDO in the earliest convenience. Due to the limited number of APDOs operating within the UK, lead times can be extensive and early engagement is therefore strongly recommended.	
26.	MoD	07 November 2025 Email correspondence	The MoD letter acknowledges updated information provided by the Applicant in two emails dated 19 August 2025 and 17 September 2025. The remainder of the letter restates the MoD safeguarding position exactly as detailed in their Scoping Opinion response of 21 November 2024.	Potential impacts on military low flying training are considered in **Sections 15.11**, **15.12** and **15.14**. The development and adherence to a LMP is an embedded mitigation measure (M-20) as detailed in **Section 15.9**. Infrared lights will be installed on the WTGs to ensure full compliance.
27.	NATS	July 2025 Email correspondence	Thank you for your email, there has been no change to the previous response i.e. NATS Safeguarding Team has a mitigation solution proposed however this is not acceptable to MOD 78 Squadron and therefore cannot be signed off internally and be made available for contracting. The Safeguarding Team are working with 78 Squadron to try and find an acceptable solution. As soon as there is an available update I will be in touch, hopefully this will be resolved before the end of 2025. Regarding the boundary changes would it be possible please to send through the latest plans showing turbine details and coordinates	Boundary and WTG coordinate details were shared with NATS via email on 19 August 2025. A technical mitigation solution has been proposed by NATS (see ID 29) that is acceptable to MoD 78 Squadron.

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
			with Eastings and Northings so I can get these checked and noted by the Safeguarding Team. If you require any additional information please do not hesitate to contact me.	
28.	NATS	12 September 2025 Online meeting	NATS restated that a proposed radar blanking mitigation solution was not acceptable to MoD, but that under the existing Indra radar upgrade programme the Tiree radar is scheduled to be upgraded by 2026 / 2027 with a 3D radar that has inbuilt windfarm capability. This effectively supersedes the radar blanking solution and simplifies the mitigation solution. NATS would prepare an assessment and send it on to MoD for approval with the aim of getting it signed off by MoD before the end of 2025.	Acknowledged.
29.	NATS	14 November 2025 Online meeting	NATS confirmed that the available mitigation solution for the Project using the Tiree Indra radar has been approved and signed off internally. NATS stated that the Indra radar is the only available radar as NATS has very few surveillance assets in the Project area. NATS confirmed that MoD has also approved the Indra mitigation solution for the Project. Subsequent to the online meeting, an email from NATS dated 14 November stated, inter alia, the following: *"Thank you very much for your time this morning and arranging the Teams Call. I can confirm that the Safeguarding Team have approved an available Mitigation for the MachairWind Offshore Windfarm using the Tiree Indra Radar which has now been signed off internally for the Development."*	A technical mitigation solution has been proposed by NATS and agreed with the MoD. The mitigation is to replace Tiree radar with a new generation Indra radar which includes technology for removing the interference caused by WTGs. The mitigation will be agreed between the Applicant and NATS in the form of a Statement of Common Understanding. The Applicant has engaged with NATS and have a draft Contract For Sale Of Consultancy Services In Relation To Wind Turbines At MachairWind Offshore Windfarm which The Applicant is negotiating, but both parties are in agreement on material terms..

ID	Consultee	Date/Engagement Activity	Stakeholder Comment	Applicant Response
30.	HIAL	19 February 2026	Meeting with HIAL was held to discuss potential mitigation options for Tiree Airport and Islay Airport IFPs. The Applicant confirmed that the Project would only utilise fixed foundations for the WTGs and that there will be no towing of pre-assembled WTGs to site. Following this meeting HIAL confirmed via email they would accept a revised IFP Impact Assessment based on sectorised areas, noting the report should clearly identify the elevation at which each defined area impacts the respective IFP, along with the proposed mitigations (IFP Amendment/Reduced tip height). HIAL noted this approach would permit development within defined areas and remove the need for updated assessments following any individual turbine location changes.	Potential impacts on Islay Airport and Tiree Airport IFPs are assessed in **Sections 15.11** and **15.12**. Further engagement with HIAL is ongoing to agree suitable revisions to the Islay and Tiree Airport IFPs in order to resolve obstacle infringements.

15.4 EXISTING DATA SOURCES

13. **Table 15.3** sets out the information and data sources that have been used to inform this chapter.

Table 15.3 Summary of key datasets and information sources

Dataset	Description	Citation
CAP 032: UK AIP	The UK AIP is the publicly available official source of information on facilities, services, rules, regulations and restrictions in UK airspace.	CAA, 2025d
UK Military AIP	The UK Military AIP is the publicly available primary source of aeronautical information and flight procedures at all UK military aerodromes.	MoD, 2025
Irish AIP	Contains information on facilities, services, rules, regulations and restrictions in Irish airspace.	Irish Aviation Authority, 2025
Protected Radar List, Office of Communications (Ofcom)	A publicly available list of the locations and antenna heights of UK civil and military radars.	Ofcom, 2024
Operational Program on the Exchange of Weather Radar Information Database	A publicly available online database of locations and antenna heights of European weather radars.	European Meteorological Network, 2025
NLB website	The website includes details of the locations and tower heights of all lighthouses operated by NLB.	NLB, 2025

15.5 SITE-SPECIFIC SURVEY DATA

14. The Project has not undertaken any site-specific surveys in addition to the existing data sources identified in **Section 15.4** to inform the EIA.

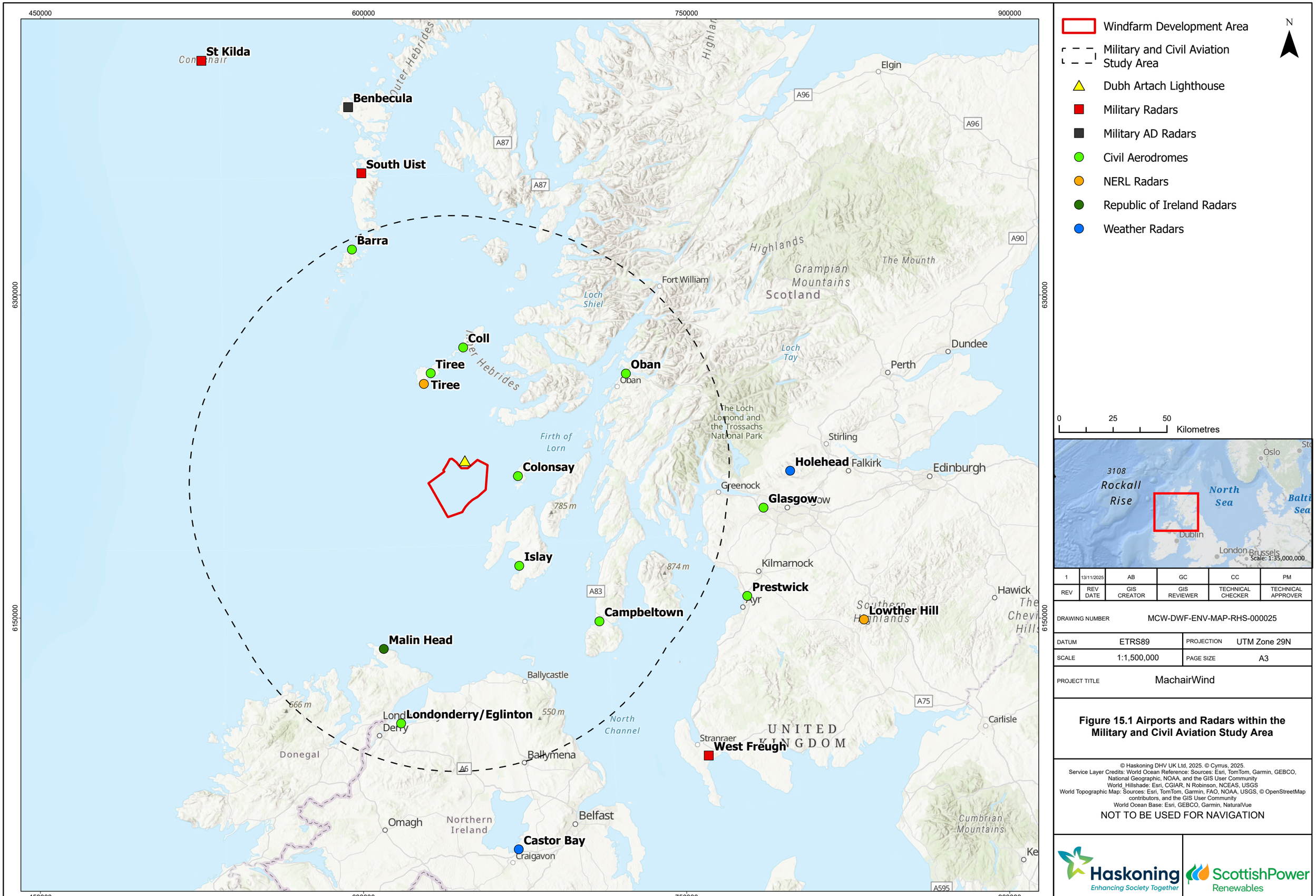
15.6 MILITARY AND CIVIL AVIATION STUDY AREA

15. In considering the spatial extent of the military and civil aviation Study Area, the overriding factor is the potential for WTGs within the WDA to have an impact on civil and military radars, taking into account required radar operational ranges. In general, Primary Surveillance Radars (PSRs) installed on civil and military airfields have an operational range of between 40 and 60 nautical miles (nm), which is equivalent to between 74 and 111 kilometres (km). All radar equipped airfields within 60 nm of the WDA are therefore included in the Study Area.

16. En-route radars operated by NATS (En-Route) plc (NERL), and military air defence (AD) radars are required to provide coverage at ranges significantly in excess of 60 nm and so all such radars with potential RLoS of WTGs in the WDA are also included in the Study Area.

17. The military and civil aviation Study Area is defined by the WDA boundary plus a buffer of 60 nm, as shown in **Figure 15.1**.

18. Criteria used to identify receptors within the Study Area are detailed in the following paragraphs.



1	13/11/2025	AB	GC	CC	PM
REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER

DRAWING NUMBER	MCW-DWF-ENV-MAP-RHS-000025		
DATUM	ETRS89	PROJECTION	UTM Zone 29N
SCALE	1:1,500,000	PAGE SIZE	A3
PROJECT TITLE	MachairWind		

Figure 15.1 Airports and Radars within the Military and Civil Aviation Study Area

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15.6.1 Civil Aerodromes

19. CAP 764: Policy and Guidelines on Wind Turbines (CAA, 2025a) states the distances from various types of aerodromes for WTG developments where consultation should take place. These distances include:

- Aerodromes with a surveillance system facility – 30 km;
- Licensed aerodromes where the WTGs will lie within airspace coincidental with any published IFP;
- Non-surveillance system equipped licensed aerodromes with a runway of 1,100 metres (m) or more – 17 km;
- Non-surveillance system equipped licensed aerodromes with a runway of less than 1,100 m – 5 km;
- Non-surveillance system equipped unlicensed aerodromes with a runway of more than 800 m – 4 km;
- Non-surveillance system equipped unlicensed aerodromes with a runway of less than 800 m – 3 km;
- Gliding sites – 10 km; and
- Other aviation activity such as parachute sites and microlight sites within 3 km.

20. CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all WTG developments will be approved, or within which they will always be objected to. For example, aerodromes may utilise their radars at ranges considerably in excess of 30 km.

21. As well as examining the technical impact of WTGs on ATC facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168: Licensing of Aerodromes (CAA, 2022c) to determine whether a proposed development has potential to breach obstacle clearance criteria at any aerodrome.

15.6.2 MoD Facilities

22. The aviation and defence activities of the MoD to be considered include:

- MoD airfields and other defence sites, both radar and non-radar equipped;
- MoD AD radars; and
- MoD Danger Areas (DAs) for both aviation and non-aviation activities.

15.6.3 NERL Facilities

23. The Project will consider the possible effects of WTGs upon NERL's en-route electronic infrastructure, which is a UK-wide network of primary and secondary radars and navigation facilities.

15.6.4 Other Aviation Activities

24. Other aviation activities under consideration include:

- General military low flying training operations; and
- Military and civilian 'off-route' fixed-wing and helicopter operations, SAR missions and offshore helicopter operations in support of offshore wind developments and lighthouses.

15.6.5 Meteorological Radio Facilities

25. WTGs have the potential to adversely impact meteorological radio facilities such as weather radar. The Met Office must be consulted when wind turbine proposals are within a 20 km radius zone of

any of their UK weather radar sites. To assist developers, maps of relevant consultation zones are provided online by the Met Office.

26. Offshore WTGs that are beyond 20 km from weather radar sites can still have an impact due to their size. For this reason, any weather radars with potential RLoS of WTGs in the WDA are under consideration.

15.7 REALISTIC WORST-CASE SCENARIOS

27. The final design of the WDA will be confirmed by detailed engineering studies post-consent. To undertake a robust and precautionary impact assessment, the realistic worst-case design scenarios (i.e., those that would cause the greatest impact) are defined from the Project Design Envelope (PDE); ensuring that all other design scenarios would have equal or less impact. Please see **Chapter 5 EIA Methodology** for further details on the design envelope approach.

28. The realistic worst-case scenarios for the military and civil aviation assessment are summarised in **Table 15.4** below. These are based on the project design as described in **Chapter 3 Project Description**.

Table 15.4 Realistic worst-case scenarios for impacts on military and civil aviation

Impact	Realistic Worst-Case Scenario	Rationale
Construction		
Impact 1: Creation of an aviation obstacle environment	• Maximum of 144 WTGs; • Maximum blade tip height of 332.88 m (1,092 feet (ft) above mean sea level (amsl); • Maximum rotor diameter of 290 m (951 ft); • Maximum of two offshore substation platforms (OSPs) with a maximum topside height including cranes, helideck and comms mast of 100 m (328 ft) above highest astronomical tide (HAT); • Jack-up vessels and heavy lift vessels; and • Construction period of five years.	Maximum physical obstruction to aviation operations due to the height and number of above sea level infrastructure. Maximum duration of impacts over the offshore construction period.
Impact 2: Increased air traffic in the area related to Project activities	Helicopters would only be required during the O&M period of the Project.	Helicopters would not be required during the construction period; therefore, this impact is scoped out of further assessment.
Operation and Maintenance		
Impact 1: Creation of an aviation obstacle environment	• Maximum of 144 WTGs; • Maximum blade tip height of 332.88 m (1,092 ft) amsl; • Maximum rotor diameter of 290 m (951 ft); • Maximum of two OSPs with a maximum topside height including cranes, helideck and comms mast of 100 m (328 ft) above HAT; and • Operational lifetime of 35 years.	Maximum physical obstruction to aviation operations due to the height and number of above sea level infrastructure. Maximum duration of impacts over the operational lifetime.
Impact 2: Increased air traffic in the area related to Project activities	• Maximum of 576 annual helicopter round trips required for routine operational and planned maintenance activities; and • Operational lifetime of 35 years.	Maximum number of helicopter trips as a result of being engaged in works on the Project causing increased possibility of aircraft-to-aircraft collision. Maximum duration of impacts over the operational lifetime.

Impact	Realistic Worst-Case Scenario	Rationale
Impact 3: Impact on civil PSR systems	• Maximum of 144 WTGs; • Maximum blade tip height of 332.88 m (1,092 ft) amsl; • Maximum rotor diameter of 290 m (951 ft); and • Operational lifetime of 35 years.	Maximum number and height of WTGs with potential for interference with radar systems. Maximum duration of impacts over the operational lifetime.
Decommissioning		
Impact 1: Creation of an aviation obstacle environment	• Maximum of 144 WTGs; • Maximum blade tip height of 332.88 m (1,092 ft) amsl; • Maximum rotor diameter of 290 m (951 ft); • Maximum of two OSPs with a maximum topside height including cranes, helideck and comms mast of 100 m (328 ft) above HAT; • Jack-up vessels and heavy lift vessels; and • Decommissioning period of five years.	Maximum physical obstruction to aviation operations due to the height and number of above sea level infrastructure. Maximum duration of impacts over the offshore decommissioning period.
Impact 2: Increased air traffic in the area related to Project activities	Helicopters would only be required during the O&M period of the Project.	Helicopters would not be required during the decommissioning period; therefore, this impact is scoped out of further assessment.

15.8 EXISTING ENVIRONMENT

15.8.1 Existing Baseline

29. A summary of the existing military and civil aviation baseline environment is provided in this section. Further details of the airspace analysis undertaken to develop the military and civil aviation baseline is provided in **Appendix 15.1 Airspace Analysis and Radar Modelling**, which also includes information on the computer modelling used to determine which radars may have RLoS of the WTGs within the WDA.

15.8.1.1 Civil Aviation

30. The Project is within the Scottish Flight Information Region (FIR), which is airspace regulated by the UK CAA. The Scottish FIR is adjacent to the Shannon FIR and the Shanwick Oceanic FIR, airspace regulated by the Irish Aviation Authority and UK CAA respectively. The boundary between the Scottish FIR and the Shannon FIR is approximately 62 km southwest and between the Scottish FIR and the Shanwick Oceanic FIR is approximately 192 km west of the WDA at its closest points.

31. Airspace is classified as either controlled or uncontrolled and is divided into a number of classes depending on what kind of ATS is provided and under what conditions. In the UK, there are five classes of airspace: specifically, A, C, D, E and G. The first four are controlled airspace classes while Class G is uncontrolled. Within controlled airspace, aircraft are monitored and instructed by ATC, whereas in uncontrolled airspace aircraft are not subject to ATC instruction but rather operate according to a simple set of regulations. ATC may still provide information, if requested, to ensure flight safety.

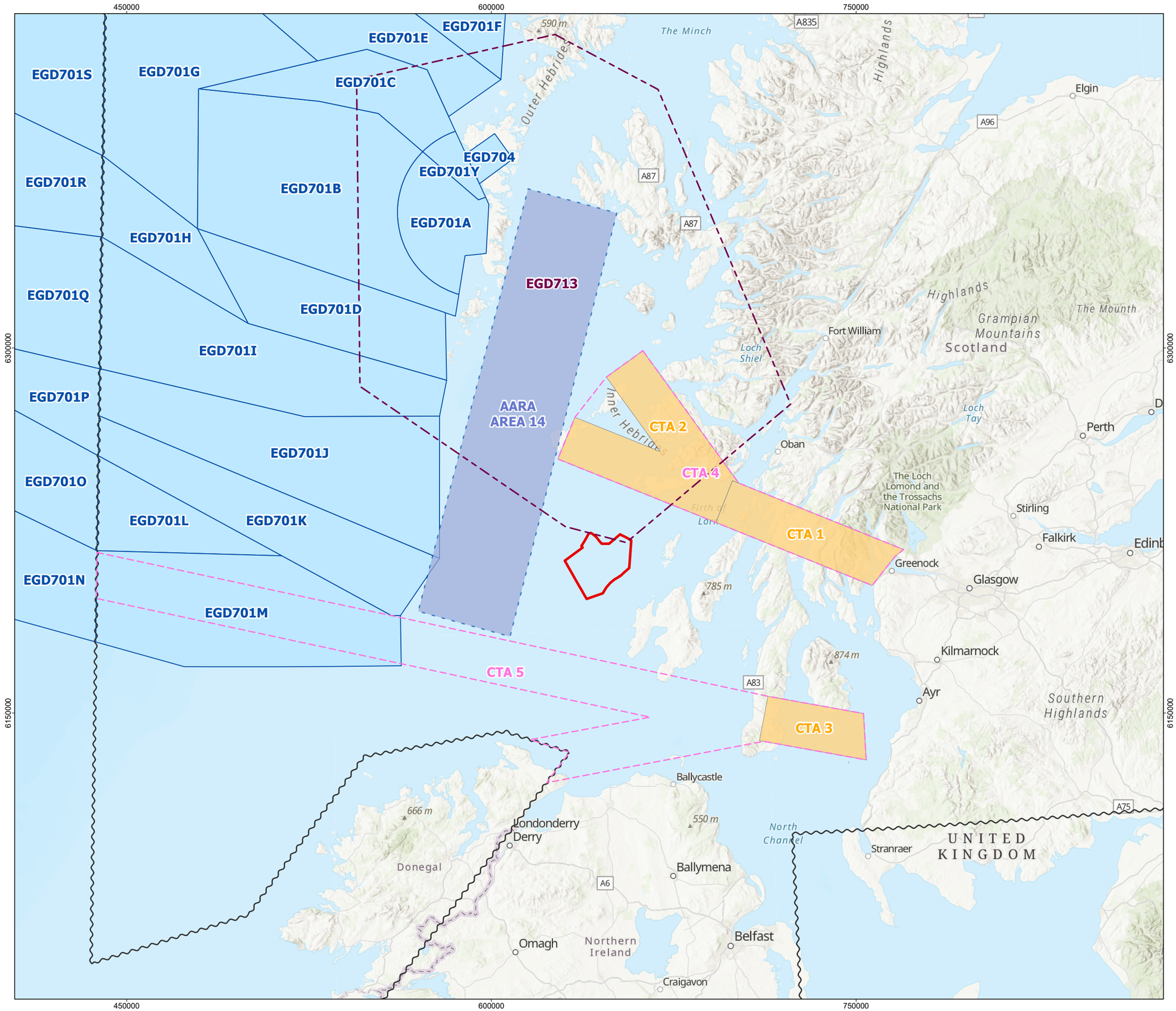
32. The airspace immediately surrounding and above the WDA is uncontrolled Class G airspace, extending vertically from sea level to Flight Level (FL) 195 (approximately 19,500 feet (ft) amsl). This airspace is used predominantly for low-level flight operations and generally by aircraft flying under Visual Flight Rules (VFR) when conditions allow.

33. Aircraft operate under one of two flight rules: VFR or Instrument Flight Rules (IFR). VFR flight is permitted when the weather satisfies Visual Meteorological Conditions (VMC) and is conducted with visual reference to the natural horizon. Aircraft must be flown under IFR when weather restricts visibility, known as Instrument Meteorological Conditions (IMC). IFR flight requires reference solely to aircraft instrumentation.

34. Laterally, the closest controlled airspace to the WDA is the Argyll Control Area (Argyll CTA). The Argyll CTA comprises CTAs 1 to 5, with CTAs 1 to 3 being Class E airspace and CTAs 4 and 5 being Class C. Argyll CTA 2 is the nearest element to the WDA, approximately 19 km to the north.

35. Argyll CTAs 1 to 3 are designated Transponder Mandatory Zones (TMZs). Within a TMZ, the carriage and operation of aircraft transponder equipment is mandatory. This enables such aircraft to be detected by Secondary Surveillance Radar (SSR) systems.

36. Airspace in the vicinity of the Project is depicted in **Figure 15.2.**



REV	REV DATE	GIS CREATOR	GIS REVIEWER	TECHNICAL CHECKER	TECHNICAL APPROVER
1	13/11/2025	AB	GC	CC	PM

DRAWING NUMBER	MCW-DWF-ENV-MAP-RHS-000026		
DATUM	ETRS89	PROJECTION	UTM Zone 29N
SCALE	1:1,500,000	PAGE SIZE	A3
PROJECT TITLE	MachairWind		

Figure 15.2 Existing Military and Civil Airspace Environment

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37. A chart of Area Minimum Altitudes (AMAs) for the Scottish FIR is published in the UK AIP. AMAs provide a minimum vertical obstacle clearance of 1,000 ft within areas defined by latitude and longitude in half degree steps. The WDA lies within AMA blocks of 1,800 ft, 2,100 ft and 4,500 ft amsl. For example, an AMA of 1,800 ft assumes that all obstacles within the block do not exceed 800 ft (243.8 m) amsl.

38. The nearest UK licensed civil aerodrome to the WDA is Colonsay Airport, located 14 km to the east of the WDA. Colonsay Airfield is a licensed aerodrome operated by Argyll and Bute Council with no associated IFPs and a runway length of 501 m. With a runway length of less than 1,100 m, Colonsay Airport is beyond the consultation range of 5 km stated in CAP 764. Also operated by Argyll and Bute Council are Oban Airport, 77 km to the northeast, and Coll Airport, 52 km to the north of the WDA. Again, these aerodromes have no associated IFPs and are beyond CAP 764 stated consultation ranges.

39. The nearest licensed aerodromes to the WDA with associated IFPs published in the AIP are Tiree Airport, 40 km to the north, Islay Airport, 36 km to the southeast, and Campbeltown Airport, 80 km to the southeast. These airports are operated by HIAL. The WDA is laterally beyond the airspace coincidental with the Campbeltown Airport IFPs but lies within airspace coincidental with the Tiree Airport and Islay Airport IFPs.

40. There are no civil aerodromes within the Study Area that are equipped with radar systems.

41. NERL provides en-route civil ATS within the Scottish FIR and operates a network of radar facilities providing en-route information on airborne traffic for both civil and military ATC units. The closest NERL en-route radars to the WDA are based at Tiree, 37 km to the north-northwest, and Lowther Hill, 185 km to the east-southeast. NERL radar facilities are combined PSR and SSR systems.

42. The closest non-UK radar facility to the WDA is Malin Head SSR in the Republic of Ireland. This facility is operated by AirNav Ireland and is 68 km south-southwest of the WDA.

43. NATS[1] do not consider the impact of WTGs on SSR to be material or relevant for WTGs that are beyond approximately 28 km from their SSR facilities. Furthermore, CAP 670: Air Traffic Services Safety Requirements (CAA, 2019) states that WTG effects on SSR *"… are only a consideration when the turbines are located very close to the SSR i.e., less than 10 km."* Given that the nearest SSR facility, at Tiree, is 37 km from the WDA, radar assessment is confined to the potential impact of WTGs on PSR systems.

44. Airports and radars in the vicinity of the Project are depicted in **Figure 15.1**.

15.8.1.2 Military Aviation

45. Military low flying training occurs throughout the Scottish FIR in Class G airspace. Military aircraft are considered to be low flying when fixed-wing aircraft are flying below 2,000 ft above the surface, or light fixed-wing aircraft and helicopters are flying below 500 ft above the surface. Specifically, the Project is within Low Flying Area 14.

46. The northern boundary of the WDA is situated beneath the Fast Jet Area South DA, EGD713 which, when active, has vertical limits from FL 245 to FL 550 (approximately 24,500 to 55,000 ft amsl). High energy manoeuvres and ordnance, munitions and explosive activities take place within EGD713.

[1] NATS is split into two main entities: NERL and NATS (Services) Ltd (NSL). NERL is the regulated, monopoly provider of en-route ATS while NSL is the commercial arm which owns the radar assets, provides consultancy services and ATS at some UK airports on a commercial basis.

47. The next nearest DAs to the WDA are the Hebrides Range DAs, comprising the EGD701 complex and EGD704, 51 km to the west of the WDA at their closest point.

48. DA airspace is not permanently active but rather is activated on request and notified by appropriate agencies such as the MoD or CAA through the issue of a NOTAM (Notice to Aviation).

49. An Air-to-Air Refuelling Area (AARA) known as AARA Area 14 is 14 km west of the WDA. AARA Area 14 is permanently available to military traffic and has vertical limits of FL 180 to FL 240 (approximately 18,000 to 24,000 ft amsl).

50. Military airspace in the vicinity of the Project is depicted in **Figure 15.2**.

51. There are no radar-equipped military airfields or ranges within the Study Area. The nearest MoD AD radar to the WDA is based at Remote Radar Head (RRH) Benbecula, 170 km to the north-northwest as shown in **Figure 15.1.**

15.8.1.3 Offshore Helidecks

52. To help achieve a safe operating environment, a 9 nautical mile (nm) (16.7 km) consultation zone for planned obstacles exists around offshore helicopter destinations. Within 9 nm (16.7 km), obstacles such as WTGs can impact upon the feasibility of helicopters to safely fly in low visibility or under missed approach procedures at the associated helideck site.

53. There are no offshore oil and gas helidecks within 9 nm of the WDA; however, the Dubh Artach lighthouse is 2 nm from the WDA northern boundary and has an associated helipad adjacent to the tower that is just above sea level. **Appendix 15.2 Dubh Artach Lighthouse Technical Note** provides further detail on helicopter access requirements and recommended setback distances between the helipad and the WDA. This setback distance is secured as an embedded mitigation measure for the Project (see **Table 15.5** below).

15.8.1.4 Search and Rescue

54. There are ten helicopter SAR bases around the UK with Bristow Helicopters providing helicopters and aircrew. The nearest SAR base is at Prestwick Airport, 130 km east-southeast of the WDA.

15.8.1.5 Met Office Weather Radars

55. The closest Met Office weather radar to the WDA is at Holehead in Stirlingshire, 140 km to the east, as depicted in **Figure 15.1**. Radar modelling in **Appendix 15.1 Dubh Artach Lighthouse Technical Note** shows that WTGs within the WDA would not be in RLoS of Holehead weather radar.

15.8.2 Predicted Future Baseline

56. The aviation industry is under long-term pressure to reduce its contribution to climate change, but this is not considered to have significant implications for the military and civil aviation baseline parameters.

57. New offshore renewable activities will have associated air traffic provided by a mix of piloted helicopter traffic and autonomous drone traffic.

15.8.3 Data Limitations and Assumptions

58. There are no known data limitations at the time of this study relating to military and civil aviation that affect the robustness of the assessment.

15.9 EMBEDDED MITIGATION

59. This section outlines the embedded mitigation relevant to the military and civil aviation assessment (as shown in **Table 15.5** below). Where additional measures are required to mitigate potentially significant effects (in EIA terms), these are detailed in the impact assessment.

Table 15.5 Embedded mitigation measures for military and civil aviation

ID	Mitigation Measure	Description	Securing Mechanism
M-20	Development of, and adherence to, a Lighting and Marking Plan (LMP)	This plan will set out the marine and aviation navigational lighting and marking measures to be applied during the construction and operation of the WDA. This will be in accordance with **Appendix 12 Outline Lighting and Marking Plan** which will incorporate the requirements of ANO 2016, of the MOD and other relevant legislation and guidance. Infrared lights will be installed on the WTGs to ensure full compliance.	Section 36 and marine licence consent conditions. An outline LMP has been provided in **Appendix 12 Outline Lighting and Marking Plan**.
M-26	Development of a Search and Rescue (SAR) checklist	Development of a SAR checklist in consultation with the MCA to ensure compliance with MGN 654 and its annexes. This will be completed post consent.	Section 36 and marine licence consent conditions. Secured via **Appendix 13 Outline Vessel Management Plan and Navigational Safety Plan**.
M-27	Development of, and adherence to, an Emergency Response and Cooperation Plan (ERCoP)	The ERCoP ensures co-operation with the MCA by detailing the design parameters of the WDA, emergency contact details, and processes to be followed. This will be developed post-consent.	Section 36 and marine licence consent conditions. Secured via an Emergency Response and Cooperation Plan which will be developed and submitted prior to construction.
M-33	Aeronautical Navigational Marking	Appropriate marking of the WDA on aeronautical charts. This will include provision of the positions and heights of structures to the CAA, MoD and Defence Geographics Centre (DGC).	Section 36 and marine licence consent conditions. Secured via **Appendix 13 Outline Vessel Management Plan and Navigational Safety Plan**.
M-34	Development of, and adherence to, a Development Specification and Layout Plan	The layout of the WTGs will be finalised post consent. Consultation with the MCA and Northern Lighthouse Board (NLB) will be undertaken to ensure that the specific WTG layout is compatible with potential SAR activity (M-26).	Section 36 and marine licence consent conditions. Secured via the requirement for a Design Specification and Layout Plan, which will be submitted to Scottish Ministers for approval prior to the commencement of construction.
M-35	Failures of Lighting and Marking	Failures of the lighting and marking in the WDA will be appropriately reported and rectified as soon as practicable. Interim hazard warnings (i.e. Notice to Mariners (M-19)) will be put in place as required.	Section 36 and marine licence consent conditions. Secured via **Appendix 12 Outline Lighting and Marking Plan**.
M-46	Development and adherence to a Decommissioning Programme	Development and adherence to a Decommissioning Programme. This programme will identify all the items of equipment, infrastructure and materials that have been installed or drilled and describes the	Section 36 and marine licence consent conditions. Secured via a Decommissioning Programme, which will be developed and submitted to Scottish Ministers for

ID	Mitigation Measure	Description	Securing Mechanism
		decommissioning solution for each, whilst considering the potential environmental effects of each method alongside appropriate mitigation techniques that can be implemented.	approval before commencement of construction.
M-49	Dubh Artach setback distance	A two nautical mile buffer has been introduced around the helipad at Dubh Artach lighthouse to ensure the safety of any vessels and helicopters associated with any works for the lighthouse	Secured within the Location Plan submitted alongside the Generation and Transmission Marine Licence Applications9

15.10 APPROACH TO ASSESSMENT

60. As noted above, due to delays stemming from the National Electricity System Operator's 2022 Holistic Network Design (HND) process, the grid connection location for the Project was confirmed in August 2025 to be in the vicinity of Girvan, South Ayrshire. As a result of these delays, this topic chapter considers the WDA Study Area and existing environment only. A combined assessment of the construction, O&M and decommissioning of the WDA activities, Offshore ECC and OnTDA activities (commensurate with the level of detail that is available at the time of carrying out that assessment) is also provided and the methodology for this is described in **Section 15.10.2**. This approach will ensure a holistic view is undertaken of the entire Project.

15.10.1 Windfarm Development Area-Alone

15.10.1.1 Methodology

61. **Chapter 5 EIA Methodology** provides a summary of the general impact assessment methodology applied in this WDA EIAR. The assessment uses the conceptual 'source-pathway-receptor' model. The model identifies potential impacts resulting from the proposed activities on the environment and sensitive receptors within it.

15.10.1.2 Value of Receptor

62. The value or sensitivity criteria for military and civil aviation are detailed in **Table 15.6**. In determining value, assessments consider the receptor's economical value, vulnerability to impact from the Project and recoverability.

Table 15.6 Value or sensitivity criteria for military and civil aviation receptors

Value or Sensitivity	Definition
High	Receptor, or the activities of the receptor, is of high value to the local, regional or national economy and / or the receptor or the activities of the receptor, is generally vulnerable to impacts that may arise from the Project and / or recoverability is slow and / or costly.
Medium	Receptor, or the activities of the receptor, is of moderate value to the local, regional or national economy and / or the receptor or the activities of the receptor, is somewhat vulnerable to impacts that may arise from the Project and / or has moderate to high levels of recoverability.
Low	Receptor, or the activities of the receptor, is of low value to the local, regional or national economy and / or the receptor or the activities of the receptor, is not generally vulnerable to impacts that may arise from the Project and / or has high recoverability.

Value or Sensitivity	Definition
Negligible	Receptor, or the activities of the receptor, is of negligible value to the local, regional or national economy and / or the receptor or the activities of the receptor, is not vulnerable to impacts that may arise from the Project and / or has high recoverability.

15.10.1.3 Magnitude of Impact

63. The magnitude criteria for military and civil aviation are detailed in **Table 15.7**. In determining magnitude, assessments consider the spatial extent, duration, frequency and reversibility of impact.

Table 15.7 Magnitude of impact criteria for military and civil aviation receptors

Magnitude	Definition
High	Total loss of ability to carry on activities and / or impact is of extended physical extent and / or long-term duration (for instance, total life of Project) and / or frequency of repetition is continuous and / or effect is not reversible for Project.
Medium	Loss or alteration to significant portions of key components of current activity and / or physical extent of impact is moderate and / or medium-term duration (for instance, up to ten years) and / or frequency of repetition is medium to continuous and / or effect is not reversible for Project phase.
Low	Minor shift away from baseline, leading to a reduction in level of activity that may be undertaken and / or physical extent of impact is low and / or short to medium-term duration (for instance, construction period) and / or frequency of repetition is low to continuous and / or effect is not reversible for Project phase.
Negligible	Very slight change from baseline condition and / or physical extent of impact is negligible and / or short-term duration (for instance, less than two years) and / or frequency of repetition is negligible to continuous and / or effect is reversible.

15.10.1.4 Significance of Effect

64. The potential significance of effect for a given impact is a function of the overall sensitivity and the magnitude of the impact (see **Chapter 5 EIA Methodology** for further details). A matrix is used (**Table 15.8**) as a framework to determine the significance of an effect. Definitions of each level of significance are provided in **Table 15.9**. Impacts and effects may be either positive (beneficial) or negative (adverse). 'Major' effects are always deemed to be significant. 'Moderate' effects are generally considered to be significant but can be assessed as not significant based on the application of professional judgement. 'Minor' and 'negligible' effects are always deemed not significant.

65. In applying this methodology, professional judgement contributes to concluding significance of effects. This judgement draws on the assessor's technical expertise, knowledge of the receiving environment, and understanding of how similar developments have influenced comparable receptors. Judgement also considers the quality and confidence of the available data (**Section 15.8.3**), the level of uncertainty associated with predicted impacts, and any relevant guidance or industry standards. Professional judgement ensures that the matrix outputs are interpreted in context, allowing the assessor to account for site-specific conditions, receptor sensitivities that may cut across criteria, and the nature of the predicted changes. This approach ensures that the determination of significance is robust, transparent and proportionate.

Table 15.8 Significance of effect matrix

Sensitivity	Adverse Magnitude				Beneficial Magnitude			
	High	Medium	Low	Negligible	Negligible	Low	Medium	High
High	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
Medium	Major	Moderate	Minor	Negligible	Negligible	Minor	Moderate	Major
Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
Negligible	Minor	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Minor

Table 15.9 Definition of significance of effect

Significance of Effect	Definition
Major	Very large or large change in receptor condition, both adverse or beneficial, which are likely to be important considerations at a national, regional or district level because they contribute to achieving national, regional or local objectives, or could result in exceedance of statutory objectives and / or breaches of legislation.
Moderate	Intermediate change in receptor condition, which are likely to be important considerations at a local level.
Minor	Small change in receptor condition, which may be raised as local issues but are unlikely to be important in the decision-making process.
Negligible	No discernible change in receptor condition.
No Change	No effect, therefore, no change in receptor condition.

15.10.2 Combined Assessment: Windfarm Development Area, Offshore Export Cable Corridor and Onshore Development Transmission Development Area Methodology

66. This section presents how the Applicant will assess interactions between the WDA, Offshore ECC and OnTDA (i.e. considering impact interactions and additive effects to determine if any effects would be materially elevated from those assessed for the WDA-alone assessment). The approach enables potential interactions between each Development Area to be identified and assessed, ensuring a whole Project assessment is undertaken in a manner that is meaningful and proportionate. This is referred to as the combined assessment.

67. In this context, interactions are considered where there may be spatial overlap of effects, and additive effects are considered where there may be incremental effects on the same receptor, including increased temporal effects.

68. Worst-case scenarios for all WDA infrastructure (which includes OSPs, OSP link cables and up to 200 km of the offshore export cable(s) which could be located within the WDA) has been incorporated into the worst-case scenario for the WDA-alone assessment (**Table 15.4** and **Section 15.11.1**).

69. To inform the combined assessment, a set of assumptions were developed which includes a preliminary boundary for the Offshore ECC and OnTDA (connect point new Girvan, South Ayrshire), anticipated project components and associated construction methods and timelines. These are set out in **Chapter 3 Project Description**, Sections 3.7 and 3.8. Offshore and onshore engineering and

environmental surveys enabling Offshore ECC and OnTDA corridor refinement are anticipated to take place after the WDA EIAR has been submitted to the consenting authorities.

70. Within the upcoming Offshore ECC and OnTDA consent applications, their respective scoping and EIARs will take account of all likely effects predicted within the WDA EIA and present updated combined assessments using the latest available information covering all aspects of the Project. .

71. **Section 15.11.2** includes a qualitative discussion where potential interactions and additive effects between the WDA and the Offshore ECC and OnTDA have been identified, with the aim of determining whether effects could result in those of greater significance than assessed for the WDA-alone assessment. To accompany the description, a combined assessment summary table is provided. Only residual effects from the WDA-alone assessment are taken forward for consideration in the combined assessment.

15.10.3 Cumulative Effects Assessment Methodology

72. The CEA considers the impacts arising from the activities and infrastructure associated with the whole-Project (i.e. the WDA, Offshore ECC and OnTDA) as well as cumulatively with other relevant plans, projects and activities. The general approach to the CEA for military and civil aviation includes identifying potential cumulative effects, identifying a short list of plans and projects for consideration and evaluating the significance of cumulative effects. **Chapter 5 EIA Methodology** provides further details on the general approach to the CEA.

73. In line with the methodology set out in **Chapter 5 EIA Methodology**, the CEA is considered in two main stages with stage 1 split into two steps:

- **Stage 1a**: Screening of Potential Cumulative Impacts;
- **Stage 1b**: Screening of other plans, projects and activities; and
- **Stage 2:** CEA.

74. Stage 1a involves the screening / identification of which whole-Project impacts could have a cumulative effect with other plans, projects and activities (described as ‘impact screening’).

75. Stage 1b is the screening of other plans, projects and activities. In accordance with guidance documents discussed in **Chapter 5 EIA Methodology**, other plans or projects that are deemed likely to go ahead or are going ahead, and for which sufficient information is available to conduct a meaningful assessment, have been taken forward for consideration in **Appendix 5.1 Cumulative Projects Long and Short Lists**. If sufficient detail is not available, it is not possible to conduct a meaningful assessment of potential cumulative effects and therefore, these developments are not considered further. For the purposes of the CEA Long-List, the criteria of other plans or projects that are proposed for consideration include those which are ‘reasonably foreseeable’ such as those:

- Which have become operational since baseline data was collected;
- Under construction;
- Permitted application(s), but not yet implemented;
- Submitted application(s) not yet determined; and
- Plans and projects with design information in the public domain, including those that requested a Scoping Opinion up to six months prior to submission of the WDA application date as follows:
  - Projects in Scottish waters;
  - Projects in English, Welsh and Northern Irish waters, or other non-UK waters if considered to be relevant, have connectivity, or the potential for a cumulative effect;
  - Offshore wind projects granted an Option Agreement or Agreement for Lease; and

- Non-wind projects.

76. The CEA Long-List has been developed based on the above criteria, and has been screened for each potential impact-receptor pathway using the following process:

- **Conceptual overlap**: an impact-receptor pathway describes an impact which has the potential to directly or indirectly affect the receptor(s) in question;
- **Physical overlap**: ability for impacts arising from the WDA, Offshore ECC and OnTDA to overlap with those from other plans or projects on a receptor basis. An overlap of the Zone of Influences (ZoIs) arising from the two (or more) projects/plans must be established for a cumulative effect to arise. There are exceptions to this for certain mobile receptors that are potentially subject to impacts from multiple plans or projects; and
- **Temporal overlap**: for a cumulative effect to arise from two or more plans or projects, a temporal overlap of impacts arising from each must be established. Some impacts are active only during certain phases of the WDA (e.g. piling noise during construction). However, the absence of a strict overlap may not necessarily mean there is no potential for cumulative effect, as receptors may become further affected by additional, non-temporally overlapping projects.

77. Stage 2 is the assessment of cumulative effects. For the assessment stage, information has been gathered based on the CEA Long-List (**Appendix 5.1**) of plans or projects taken forward from the screening stage. A tiered approach is used to provide a framework for placing relative weight on the potential for each plan or project to be included in the CEA, based on the plan's or project's current stage of maturity, certainty in the design or effects and overall availability of detail on which to carry out an assessment. Projects or plans that will be assessed in Stage 2 will use the following tiers:

- Tier 1 assessment: projects which are operational (but not part of the baseline), under construction, those with consent and those projects where an application has been submitted but not yet determined;
- Tier 2 assessment: all plans/projects assessed under Tier 1, plus those projects with a Scoping Report and/or Scoping Opinion; and
- Tier 3 assessment: all plans/projects assessed under Tier 1 and Tier 2, plus those projects likely to come forward where a Crown Estate Scotland (CES) Option to Lease Agreement or equivalent has been granted (i.e., ScotWind and Innovation and Targeted Oil & Gas (INTOG) projects).

15.10.4 Transboundary Effects Assessment Methodology

78. The transboundary effect assessment considers the potential for effects to occur as a result of the WDA on military and civil aviation receptors within the Exclusive Economic Zone (EEZ) of other European Economic Area (EEA) member states or other interests of EEA member states. **Chapter 5 EIA Methodology** provides further details on the approach to the transboundary effect assessment.

79. For military and civil aviation, no significant transboundary effects are predicted as potential impacts of WTGs on military and civil aviation receptors are localised and the WDA is wholly within UK airspace. Although the military and civil aviation Study Area partially encompasses Irish airspace to the southwest of the WDA, there are no known non-UK PSR systems with the potential to detect WTGs within the WDA.

15.11 ASSESSMENT OF SIGNIFICANCE

15.11.1 Windfarm Development Area-Alone Assessment of Significance

80. The potential effects on military and civil aviation receptors that may occur during construction, operation and decommissioning of the WDA are assessed in the following sections. The assessment follows the methodology set out in **Section 15.10.1** and is based on the realistic worst-case scenarios

defined in **Section 15.7**, with consideration of embedded mitigation measures identified in **Section 15.9.**

81. This assessment has been undertaken on the basis of all embedded mitigation measures outlined in **Table 15.5**. The embedded mitigation measures relevant for each impact are listed in the summary **Table 15.19**.

15.11.1.1 Impact 1: Creation of an Aviation Obstacle Environment

82. Construction of the windfarm would involve heavy lift crane vessels and the installation of infrastructure above sea level that may pose a physical obstruction to low flying aircraft utilising the airspace in the vicinity, potentially increasing the risk of obstacle collision or requiring aircraft to fly extended routes to avoid obstacles. From a starting point of no offshore infrastructure, the infrastructure in **Table 15.4** would gradually be installed over a maximum offshore construction period of five years.

83. During the 35-year O&M period, the infrastructure outlined in **Table 15.4** would be present in the WDA.

84. During the decommissioning period heavy lift crane vessels would be involved in the gradual removal of all infrastructure above sea level within the WDA.

85. Specifically, permanent or temporary obstacles could impact the following receptors:

- Offshore helicopter operations;
- SAR missions;
- Military low flying training operations;
- Islay Airport IFPs; and
- Tiree Airport IFPs.

15.11.1.1.1 Sensitivity

15.11.1.1.1.1 Offshore Helicopter Operations, SAR Missions, Military Low Flying Training Operations

86. These receptors, as with all aviation receptors, are deemed to be of high value. Civilian and military flying operations are highly regulated and procedures and rules are designed with obstacle avoidance as a prime requirement. Embedded mitigation in the form of obstacle lighting, notification and charting would ensure that all pilots are aware of the presence of obstacles. The ability of these receptors to continue flying safely in the vicinity of the WDA is therefore considered to be of low vulnerability and high recoverability. The overall sensitivity of the receptors is therefore considered to be **medium**.

15.11.1.1.1.2 Islay Airport IFPs, Tiree Airport IFPs

87. Islay Airport and Tiree Airport IFPs are deemed to be of high vulnerability as any infringements of protected IFP surfaces would necessitate the withdrawal from use of the IFP. IFPs are considered to have low recoverability as redesigning IFPs is a costly and slow process. IFPs are of high value as their non-availability could have a direct economic impact on an airport. The sensitivity of the receptors is therefore considered to be **high**.

15.11.1.1.2 Magnitude of Impact

15.11.1.1.2.1 Construction

15.11.1.1.2.1.1 Offshore Helicopter Operations, SAR Missions, Military Low Flying Training Operations

88. As detailed in **Table 15.5**, potential impacts on flying activities in the vicinity of the WDA would be mitigated through the development of an LMP in agreement with key aviation stakeholders (M-20) and through the provision of the positions and heights of structures to the CAA, MoD and DGC to enable appropriate marking and updating of aeronautical charts (M-33). The LMP would also cover the lighting and marking of construction equipment such as heavy lift cranes.

89. The lighting of WTGs and the final WTG layout would be compatible with SAR requirements (M-34), and a SAR checklist (M-26) and ERCoP (M-27) would be developed.

90. The northern boundary of the WDA has been refined to allow for a 2 nm spacing between the Dubh Artach helipad and the WDA where the WTGs would be located. Based on the assessment within **Appendix 15.2 Dubh Artach Lighthouse Technical Note** and input from NLB, this is considered sufficient for helicopter operations to continue at the Dubh Artach Lighthouse with the Project constructed.

91. The aviation obstacle environment, and hence the area of impact, would be confined to the WDA, with the spatial extent gradually increasing during the construction phase.

92. The impact on receptors is predicted to be of local spatial extent, short to medium-term duration, intermittent and low reversibility. The magnitude of the impact is therefore considered to be **low**.

15.11.1.1.2.1.2 Islay Airport IFPs, Tiree Airport IFPs

93. WTGs within the WDA could become a physical obstacle to flight operations at Islay Airport and Tiree Airport. Specifically, WTGs could infringe the protected obstacle clearance surfaces associated with the airports' published IFPs. An IFP is a pre-defined route for aircraft to follow by reference to flight instruments. The IFP gives pilots reassurance of properly designated obstacle and terrain protection whilst manoeuvring in conditions of poor visibility. WTGs that infringe the protected surfaces associated with IFPs would require IFPs to be redesigned with higher minimum safe altitudes.

94. The non-availability of IFPs could have a direct impact on an airport's viability and hence this can be considered a potentially regional impact.

95. The impact on Islay Airport and Tiree Airport IFPs is predicted to be of regional spatial extent, short-term duration, intermittent and low reversibility. It is predicted that the impact would affect the receptors directly. The magnitude of impact is therefore considered to be **medium**.

15.11.1.1.2.2 Operation and Maintenance

15.11.1.1.2.2.1 Offshore Helicopter Operations, SAR Missions, Military Low Flying Training Operations

96. The embedded mitigations would be the same as those detailed for the construction period.

97. The aviation obstacle environment, and hence the area of impact, would be confined to the WDA.

98. The impact on receptors is predicted to be of local spatial extent, long-term duration, intermittent and low reversibility. The magnitude of the impact is therefore considered to be **low**.

15.11.1.1.2.2.2 Islay Airport IFPs, Tiree Airport IFPs

99. The non-availability of IFPs could have a direct impact on an airport's viability and hence this can be considered a potentially regional impact.

100. The impact on Islay Airport and Tiree Airport IFPs is predicted to be of regional spatial extent, long-term duration, intermittent and low reversibility. It is predicted that the impact would affect the receptors directly. The magnitude of impact is therefore considered to be **medium**.

15.11.1.1.2.3 Decommissioning

15.11.1.1.2.3.1 Offshore Helicopter Operations, SAR Missions, Military Low Flying Training Operations

101. The embedded mitigations would be the same as those detailed for the construction period. Additionally, a Decommissioning Programme would be developed and adhered to (M-46).

102. The aviation obstacle environment, and hence the area of impact, would be confined to the WDA, with the spatial extent gradually decreasing during the decommissioning phase.

103. The impact on receptors is predicted to be of local spatial extent, short to medium-term duration, intermittent and low reversibility. The magnitude of the impact is therefore considered to be **low**.

15.11.1.1.2.3.2 Islay Airport IFPs, Tiree Airport IFPs

104. The non-availability of IFPs could have a direct impact on an airport's viability and hence this can be considered a potentially regional impact.

105. The impact on Islay Airport and Tiree Airport IFPs is predicted to be of regional spatial extent, short-term duration, intermittent and low reversibility. It is predicted that the impact would affect the receptors directly. The magnitude of impact is therefore considered to be **medium**.

15.11.1.1.3 Significance of Effect

15.11.1.1.3.1 Offshore Helicopter Operations, SAR Missions, Military Low Flying Training Operations

106. Embedded mitigation measures detailed in **Table 15.5** with respect to notification, charting, marking and lighting of obstacles would make pilots aware of the addition of infrastructure to the WDA, and it is assumed that pilots would comply with all relevant CAA and MoD aviation regulatory requirements. The ultimate responsibility for seeing and avoiding obstacles in uncontrolled Class G airspace rests with the captains of civilian and military aircraft.

107. For all three phases, it is predicted that the sensitivity / value of the receptors is **medium** and the magnitude of impact is **low**. The effect is therefore of **minor** significance, which **is not significant** in EIA terms.

15.11.1.1.3.2 Islay Airport IFPs, Tiree Airport IFPs

108. For all three phases, it is predicted that the sensitivity / value of the receptors is **high** and the magnitude of impact is **medium**. The effect is therefore of **major** significance, which **is significant** in EIA terms.

15.11.1.1.3.3 Additional Mitigation and Residual Effect

15.11.1.1.3.3.1 Islay Airport IFPs, Tiree Airport IFPs

109. Consultation has been initiated with HIAL to make them aware of potential obstacle infringements of IFPs and operational effects at Islay Airport and Tiree Airport. Before Project construction commences, final details of WTG locations and blade tip heights would be provided to the stakeholders. This would enable suitable revisions of the impacted IFPs to be agreed jointly with the affected airports. To revise IFPs, an airspace change proposal must be prepared and submitted for CAA approval. The formal airspace change process that has to be followed is explained in CAP 1616: Airspace Change Process (CAA, 2025c).

110. With suitable revisions to the Islay and Tiree Airport IFPs, the magnitude of impact would be **negligible**. The residual effect is therefore of **minor** significance, which **is not significant** in EIA terms.

Table 15.10 Significance of effect for Impact 1: Creation of an aviation obstacle environment

Phase	Receptor	Sensitivity	Magnitude	Significance of Effect	Additional Mitigation	Residual Effect
Construction	Offshore helicopter operations SAR missions Military low flying training operations	Medium	Low	Minor	N/A	Minor
	Islay Airport IFPs Tiree Airport IFPs	High	Medium	Major	Suitable revisions to IFPs to be prepared and implemented in accordance with the Airspace Change Process following consultation with HIAL.	Minor
O&M	Offshore helicopter operations SAR missions Military low flying training operations	Medium	Low	Minor	N/A	Minor
	Islay Airport IFPs Tiree Airport IFPs	High	Medium	Major	Suitable revisions to IFPs to be prepared and implemented in accordance with the Airspace Change Process following consultation with HIAL.	Minor
Decommissioning	Offshore helicopter operations SAR missions Military low flying training operations	Medium	Low	Minor	N/A	Minor
	Islay Airport IFPs Tiree Airport IFPs	High	Medium	Major	Suitable revisions to IFPs to be prepared and implemented in accordance with the Airspace Change Process following consultation with HIAL.	Minor

15.11.1.2 Impact 2: Increased Air Traffic in the Area related to Project Activities

111. The O&M period would likely see an increase in helicopter traffic above the current baseline level engaged in works on the Project. Up to 576 annual helicopter round trips would be required for routine operational and planned maintenance activities. The possible increase in air traffic associated with support activities brings with it a potential increased possibility of aircraft collision in the airspace around the Project.

15.11.1.2.1 Sensitivity

112. Helicopter support operations and existing air traffic, as with all aviation receptors, are deemed to be of high value. Civilian and military flying operations are highly regulated and pilots adhere to flight procedures and rules that are designed to ensure safe standard separation distances between aircraft are maintained at all times. The ability of these receptors to continue flying safely is therefore considered to be of low vulnerability and high recoverability. The overall sensitivity of the receptors is therefore considered to be **medium**.

15.11.1.2.2 Magnitude of Impact

113. The increase in air traffic would be managed by the existing ATS infrastructure, provided in accordance with national procedures, and pilots would be expected to operate in accordance with regulatory requirements. Low-level flights in the vicinity of the WDA would be conducted under day VMC, and pilots would follow the principle of ‘see and avoid’.

114. The impact on receptors is predicted to be of local spatial extent, long-term duration, intermittent and low reversibility. It is predicted that the impact would affect the receptors directly. The magnitude of the impact is therefore considered to be **low**.

15.11.1.2.3 Significance of Effect

115. Overall, it is predicted that the sensitivity / value of the receptors is **medium** and the magnitude of impact is **low**. The effect is therefore of **minor** significance, which **is not significant** in EIA terms.

Table 15.11 Significance of effect for Impact 2: Increased air traffic in the area related to project activities

Phase	Receptor	Sensitivity	Magnitude	Significance of Effect	Additional Mitigation	Residual Effect
Construction	N/A	N/A	N/A	N/A	N/A	N/A
O&M	Helicopter support operations Existing air traffic	Medium	Low	Minor	N/A	Minor
Decommissioning	N/A	N/A	N/A	N/A	N/A	N/A

15.11.1.3 Impact 3: Impact on Civil PSR Systems

116. The WDA would be within the operational range of radar systems serving both civil and military agencies. Radar modelling detailed in **Appendix 15.1 Airspace Analysis and Radar Modelling** shows that all WTGs within the WDA would be in RLoS and theoretically detectable by the NERL PSR at Tiree. The modelling also shows that WTGs within the WDA would not be in RLoS of any other civil, military or Met Office radars.

117. When operational (WTGs with blades fitted and rotating), WTGs have the potential to generate 'clutter' (or false targets) upon radar displays because current generation PSRs cannot easily differentiate between the moving blades of WTGs and aircraft. As a consequence, radar controllers may be unable to distinguish between primary radar returns generated by WTGs and those generated by aircraft. As a general rule, controllers are required to provide 5 nm (9.3 km) lateral separation between traffic receiving ATS and 'unknown' primary radar returns in Class G airspace. This may therefore have an adverse effect on the provision of a safe and effective en-route surveillance service by controllers at NATS Prestwick Centre. Prestwick Centre handles air traffic across northern England, Scotland and in the North East Atlantic and is one of two air traffic control (ATC) centres in the UK operated by NATS. On the other hand, Prestwick Airport is an entirely separate entity which would not be impacted by the Project.

118. Specifically, WTGs within the WDA could impact the following PSR receptor:

- NERL Tiree PSR.

15.11.1.3.1 Sensitivity

119. NERL Tiree PSR is deemed to be of high value and vulnerable to WTG impacts, with a high level of recoverability. The overall sensitivity of the receptor is therefore considered to be **high**.

15.11.1.3.2 Magnitude of Impact

120. In its Scoping Opinion response (**Table 15.2**), NATS stated that WTGs within the WDA are likely to cause false primary plots to be generated for Tiree PSR and reduce the PSR's probability of detection for real aircraft. This would lead to an unacceptable impact on the en-route traffic operations for Prestwick Centre ATC.

121. The impact on NERL Tiree PSR is predicted to be of local spatial extent (limited to within the WDA), long-term duration, medium to continuous frequency of repetition and not reversible. The magnitude of the impact is therefore considered to be **medium**.

15.11.1.3.3 Significance of Effect

122. WTG generated radar clutter could compromise the safe and effective provision of civil ATS.

123. Overall, it is predicted that the sensitivity / value of the receptor is **high** and the magnitude of impact is **medium**. The effect is therefore of **major** significance, which **is significant** in EIA terms.

15.11.1.3.3.1 Additional Mitigation and Residual Effect

124. NATS has recently awarded Indra with a contract to upgrade the network of NERL operated en-route radars with new state-of-the-art systems. The PSRs at each of the ten existing NERL radar sites, including Tiree, will be replaced with an Indra PSR3D. The PSR3D incorporates advanced algorithms that give it the capability to mitigate the adverse effects of WTGs. NATS has confirmed that the "Indra solution" can be used as the radar mitigation for the Project, and that the mitigation is acceptable to military users of Tiree PSR (MoD 78 Squadron).

125. The mitigation will be agreed between the Applicant and NATS in the form of a Statement of Common Understanding. The Applicant shared the updated Project parameters and timescales with NATS Safeguarding team to assist with their mitigation option studies and consultation with the MoD; in November 2025, NATS confirmed the approval of an available mitigation solution which has been agreed between NATS and the MoD for the Project. See **Table 15.2** above for a further details regarding the pre-application consultation undertaken with NATS.

126. The Applicant has engaged with NATS and have a draft Contract For Sale Of Consultancy Services In Relation To Wind Turbines At MachairWind Offshore Windfarm which The Applicant is negotiating, but both parties are in agreement on material terms.

127. With suitable technical mitigations in place, the magnitude of impact would be **negligible**. The residual effect is therefore of **minor** significance, which **is not significant** in EIA terms.

Table 15.12 Significance of effect for Impact 3: Impact on Civil PSR Systems

Phase	Receptor	Sensitivity	Magnitude	Significance of Effect	Additional Mitigation	Residual Effect
Construction	N/A	N/A	N/A	N/A	N/A	N/A
O&M	NERL Tiree PSR	High	Medium	Major	NATS has approved a radar technical mitigation solution that has also been approved by the MoD.	Minor
Decommissioning	N/A	N/A	N/A	N/A	N/A	N/A

15.11.2 Combined Assessment: Windfarm Development Area, Offshore Export Cable Corridor and Onshore Development Transmission Development Area

15.11.2.1 Impact 1: Creation of an Aviation Obstacle Environment

128. Construction within the Offshore ECC would likely involve cable-laying vessels which would not have an elevation profile sufficient to have any impact on any civil or military aviation receptors and no permanent above surface infrastructure would be installed within the Offshore ECC.

129. Since the height of vessels would not be sufficient to create an aviation obstacle, there would be no impact pathway to receptors.

130. The effect significance would **no change** which **is not significant** in EIA terms.

131. The OnTDA will be located in South Ayrshire and therefore will be laterally separated from any protected surfaces associated with IFPs at Islay Airport and Tiree Airport. In any case, plant equipment used during construction and any buildings such as substations would be significantly below any IFP minimum protected heights.

132. Since the OnTDA will lie significantly beyond any airspace coincidental with the IFPs at Islay Airport and Tiree Airport, there would be no impact pathway to receptors.

133. The effect significance would **no change** which **is not significant** in EIA terms.

15.11.2.2 Impact 2: Increased Air Traffic in the Area related to Project Activities

134. There would be no additional air traffic associated with construction, O&M or decommissioning of the Offshore ECC or OnTDA and therefore no impact pathway to receptors.

135. The effect significance would **no change** which **is not significant** in EIA terms.

15.11.2.3 Impact 3: Impact on Civil PSR Systems

136. Impacts on NERL Tiree PSR would solely be from WTGs within the WDA. There is no expected pathway for the Onshore ECC or OnTDA to have any effects on NERL Tiree PSR.

137. The effect significance would **no change** which **is not significant** in EIA terms.

15.11.2.4 Combined Assessment Summary

Table 15.13 Military and civil aviation combined assessment summary

Receptor/Topic	WDA Residual Effect	Offshore ECC Assessment of Effects	OnTDA Assessment of Effects	Combined Assessment
C, O&M, D* Impact 1: Creation of an aviation obstacle environment	Not Significant (Minor Adverse).	Not Significant (No Change) – no pathway to receptors.	Not Significant (No Change) – no pathway to receptors.	No significant residual effects likely.
O&M Impact 2: Increased air traffic in the area related to Project activities	Not Significant (Minor Adverse).	Not Significant (No Change) – no pathway to receptors.	Not Significant (No Change) – no pathway to receptors.	No significant residual effects likely.
O&M Impact 3: Impact on civil PSR systems	Not Significant (Minor Adverse).	Not Significant (No Change) – no	Not Significant (No Change) – no	No significant residual effects likely.

Receptor/Topic	WDA Residual Effect	Offshore ECC Assessment of Effects	OnTDA Assessment of Effects	Combined Assessment
		pathway to receptors.	pathway to receptors.	
* C = Construction, O&M = Operation and Maintenance, D = Decommissioning				

15.12 CUMULATIVE EFFECTS

15.12.1 Screening of Potential Cumulative Impacts

138. The first step in the CEA is the screening / identification of which whole-Project impacts could have a cumulative effect with other plans, projects and activities (described as 'impact screening'). This information is set out in **Table 15.14**, together with a consideration of the confidence in the data that is available to inform a detailed assessment and the associated rationale.

Table 15.14 Potential cumulative impacts (impact screening)

Impact	Potential for Cumulative Impact	Data Confidence	Rationale
Construction			
Impact 1: Creation of an aviation obstacle environment	Yes	High	WTGs and heavy lift crane vessels associated with other developments create obstacles, restricting the available airspace.
Operation and Maintenance			
Impact 1: Creation of an aviation obstacle environment	Yes	High	WTGs associated with other developments create obstacles, restricting the available airspace.
Impact 2: Increased air traffic in the area related to Project activities	Yes	High	Air traffic activities associated with other developments have the potential to cumulatively increase the possibility of aircraft collision.
Impact 3: Impact on civil PSR systems	Yes	High	Other offshore windfarms could impact PSRs over a larger area.
Decommissioning			
Impact 1: Creation of an aviation obstacle environment	Yes	High	WTGs and heavy lift crane vessels associated with other developments create obstacles, restricting the available airspace.

15.12.2 Screening of Other Plans, Projects and Activities

139. The second screening step in the CEA is the identification of the other plans, projects and activities that may result in cumulative impacts for inclusion in the CEA (described as 'project screening'). This information is set out in **Table 15.15**, together with consideration of the relevant details of each, including current status (e.g. under construction), planned construction period, closest distance to the Project, status of available data and rationale for including or excluding from the assessment.

140. The project screening has been informed by the development of a CEA Long List (**Appendix 5.1**) which forms an exhaustive list of plans, projects and activities in a very large Study Area. The list has been appraised, based on the confidence in being able to undertake an assessment from the information and data available, enabling individual plans, projects and activities to be screened in or out. As described in **Section 15.10.3**, this has been undertaken using a tiered approach to provide a framework for placing relative weight on the potential for each plan or project to be included in the CEA for this topic.

141. Assessment of cumulative impacts on military and civil aviation receptors has considered projects to a range of 100 km from the WDA. The potential cumulative effects of PSR impacts on ATC operations diminishes as the separation between windfarm sites increases. A separation distance of 100 km is considered to be a pragmatic range beyond which cumulative impacts will be negligible.

Table 15.15 Planned projects within 100 km of the Project

Project / Plan	Status	Closest Distance from the WDA (km)	Closest Distance from the Offshore ECC (km)	Description of Project / Plan	Construction Period	Operational Period	Data Confidence	Overlap with the WDA	Included in the CEA	Rationale
Tier 3 projects / plans (all plans/projects assessed under Tier 1 and Tier 2, plus those projects likely to come forward where a CES Option to Lease Agreement or equivalent has been granted (i.e., ScotWind and INTOG projects)										
Malin Sea Wind	Early planning	48 km	13 km	Offshore windfarm	2030	2031	Low	Potential for temporal overlap[2]	Yes	Potential for cumulative effects from impacts on NERL Tiree PSR.
Dubh Artach and Skerryvore Refurbishment Works	In planning	3.7km	30 km	Lighthouse refurbishment works	Refurbishment works 2027 to 2032		High	Potential for temporal overlap[1]	No	Potential for cumulative effects related to increased air traffic, however refurbishment works will be completed before the Project's O&M phase when helicopters may be used, so no temporal overlap expected.

[2] Construction period for MachairWind estimated to take place in late 2020's – late 2030's (see Section 3.7 of **Chapter 3 Project Description** for further information)

15.12.3 Cumulative Effects Assessment

15.12.3.1 Cumulative Impact 1: Creation of an Aviation Obstacle Environment

142. The lateral separation between the WDA and the Malin Sea Wind site is such that there is no potential for cumulative impacts on low flying aircraft to occur. A range of 40 km is considered to be the maximum separation between offshore projects for cumulative impacts of this nature.

143. The Malin Sea Wind site is within airspace coincidental with Islay Airport's IFPs; however, an initial review of the IFPs indicates that WTGs at the Malin Sea Wind site would not infringe protected IFP surfaces.

15.12.3.2 Cumulative Impact 2: Increased Air Traffic in the Area related to Project Activities

144. It is not known whether there would be any helicopter traffic associated with the various phases of the Malin Sea Wind development; however, the lateral separation between the WDA and the Malin Sea Wind site is such that there is no potential for a cumulative increase in the possibility of aircraft collision. A range of 40 km is considered to be the maximum separation between offshore projects for cumulative impacts of this nature.

15.12.3.3 Cumulative Impact 3: Impact on Civil PSR Systems

145. WTGs within the WDA would be in RLoS and theoretically detectable by the NERL PSR at Tiree. The WTG tip heights proposed for Malin Sea Wind are not known; however, it is likely that these WTGs would also be detected by Tiree PSR.

15.12.3.3.1 Sensitivity

146. NERL Tiree PSR is deemed to be of high value and vulnerable to WTG impacts, with a high level of recoverability. The overall sensitivity of the receptor is therefore considered to be **high**.

15.12.3.3.2 Magnitude of Impact

147. In its Scoping Opinion response (**Table 15.2**), NATS stated that WTGs within the WDA are likely to cause false primary plots to be generated for Tiree PSR and reduce the PSR's probability of detection for real aircraft. A similar impact would be expected due to the Malin Sea Wind WTGs. This would lead to an unacceptable impact on the en-route traffic operations for Prestwick Centre ATC.

148. The cumulative impact is predicted to be of regional spatial extent, long-term duration, medium to continuous frequency of repetition and not reversible. The magnitude of the cumulative impact is therefore considered to be **medium**.

15.12.3.3.3 Significance of Effect

149. Cumulative WTG generated radar clutter could compromise the safe and effective provision of civil ATS over a large area.

150. Overall, it is predicted that the sensitivity / value of the receptor is **high** and the magnitude of cumulative impact is **medium**. The cumulative effect is therefore of **major** significance, which **is significant** in EIA terms.

15.12.3.3.3.1 Additional Mitigation and Residual Effect

151. Future operational offshore wind developments, including the Project and Malin Sea Wind, must have any necessary radar mitigation solutions in place before becoming operational. With suitable

technical mitigations implemented, the magnitude of the cumulative impact would be **negligible**. The residual cumulative effect is therefore of **minor** significance, which **is not significant** in EIA terms.

15.13 TRANSBOUNDARY EFFECTS

152. No potential for significant transboundary effects from the WDA on military and civil aviation receptors within the EEZ of other EEA member states or other interests of EEA member states have been identified. Therefore, transboundary effects have been scoped out of the EIA, in line with the Scoping Report.

15.14 INTER-RELATED AND INTERACTING IMPACTS

15.14.1 Inter-Relationships

153. **Table 15.16** below provides a summary of the key inter-relationships between military and civil aviation and other technical chapters and indicates where those issues have been addressed in the relevant chapters.

Table 15.16 Military and civil aviation inter-relationships

Topic and description	Related chapter(s)	Where addressed in this chapter	Rationale
Construction			
Creation of an aviation obstacle environment – installation of above sea level infrastructure obstructing low flying aircraft.	Chapter 13 Shipping and Navigation Chapter 16 Seascape, Landscape and Visual Impacts	Marking and lighting would be in accordance with both aviation and maritime requirements as stated in **Table 15.5.**	Aviation lighting could be mistaken for maritime lighting; however, if the default aviation lighting could generate issues, then the CAA may approve the use of a flashing red Morse Code Letter 'W' instead (CAP 764 paragraph 5.11). Aviation lighting could have an adverse visual impact; however, in accordance with ANO Article 223, lighting intensity would be reduced at and below the horizontal plane and further reduced when visibility in all directions from every WTG is more than 5 km.
Creation of an aviation obstacle environment – installation of above sea level infrastructure obstructing low flying aircraft.	Chapter 17 Infrastructure and Other Marine Users	Helicopter operations at Dubh Artach Lighthouse assessed in **Section 15.11.1.1.2.1.1**.	Refinement of the WDA boundary also allows for marine operations at Dubh Artach Lighthouse.
Operation and Maintenance			
Creation of an aviation obstacle environment – WTGs and OSPs obstructing low flying aircraft.	Chapter 13 Shipping and Navigation Chapter 16 Seascape, Landscape and Visual Impacts	Marking and lighting would be in accordance with both aviation and maritime requirements as stated in **Table 15.5**.	Aviation lighting could be mistaken for maritime lighting; however, if the default aviation lighting could generate issues then the CAA may approve the use of a flashing red Morse Code Letter 'W' instead (CAP 764 paragraph 3.16).

Topic and description	Related chapter(s)	Where addressed in this chapter	Rationale
			Aviation lighting could have an adverse visual impact; however, in accordance with ANO Article 223, lighting intensity would be reduced at and below the horizontal plane and further reduced when visibility in all directions from every WTG is more than 5 km.
Creation of an aviation obstacle environment – WTGs and OSPs obstructing low flying aircraft.	Chapter 17 Infrastructure and Other Marine Users	Helicopter operations at Dubh Artach Lighthouse assessed in **Section 15.11.1.1.2.1.1**.	Refinement of the WDA boundary also allows for marine operations at Dubh Artach Lighthouse.
Decommissioning			
Creation of an aviation obstacle environment – removal of above sea level infrastructure obstructing low flying aircraft.	Chapter 17 Infrastructure and Other Marine Users	Helicopter operations at Dubh Artach Lighthouse assessed in **Section 15.11.1.1.2.1.1**.	Refinement of the WDA boundary also allows for marine operations at Dubh Artach Lighthouse.

15.14.2 Interactions

154. The impacts identified and assessed in this chapter have the potential to interact with each other. Areas of potential interaction between impacts are presented in **Table 15.17** below. The impacts are assessed relative to each development phase (i.e. construction, O&M or decommissioning) to see if (for example) multiple construction impacts affecting the same receptor could increase the magnitude of impact upon that receptor. Given that, for military and civil aviation, only a single impact has been identified in both the construction and decommissioning phases, potential interactions between impacts have only been assessed for the O&M phase.

155. A subsequent lifetime assessment has been undertaken which considers the impact interactions identified and the potential for impacts to effect receptors relevant to this chapter across all development phases (**Table 15.18**).

Table 15.17 Potential interactions between impacts – operation and maintenance

Potential Interactions Between Operation and Maintenance Impacts			
	Impact 1: Creation of an aviation obstacle environment	Impact 2: Increased air traffic in the area related to Project activities	Impact 3: Impact on civil PSR systems
Impact 1: Creation of an aviation obstacle environment	-	Yes	Yes
Impact 2: Increased air traffic in the area related to Project activities	Yes	-	Yes
Impact 3: Impact on civil PSR systems	Yes	Yes	-

Table 15.18 Potential interactions between impacts – phase and lifetime assessment

Potential Interactions Between Impacts					
Receptor	**Construction**	**Operation and Maintenance**	**Decommissioning**	**Phase Assessment**	**Lifetime Assessment**
Offshore helicopter operations SAR missions Military low flying training operations	Minor adverse	Minor adverse	Minor adverse	**No greater than individually assessed impacts.** Tiree PSR clutter from WTGs during the O&M phase could compromise the safe and effective provision of civil and military ATS in the vicinity of the WDA. This impact in combination with the impact from the creation of an aviation obstacle environment could increase the overall significance of effects on low flying aircraft receptors. However, with suitable additional technical mitigation in place the PSR effect would be of minor significance. As such, the significance of the effect on low flying aircraft receptors is not anticipated to increase beyond that already assessed.	**No greater than individually assessed impact for each phase.** The spatial extent of the aviation obstacle environment would gradually increase during the construction phase as infrastructure is installed within the WDA. The obstacle environment would then remain constant until the decommissioning phase. The impacts during the different phases are not anticipated to interact in such a way as to generate an effect of greater significance than those assessed for individual phases.
Helicopter traffic engaged in works on the Project	N/A	Minor adverse	N/A	**No greater than individually assessed impacts.** There is potential interaction between impacts identified in the O&M phase; however, all potential effects are not significant and are localised in nature. Embedded mitigation measures, the existing ATS infrastructure, and pilot compliance with regulatory requirements would reduce the potential for interaction of impacts; therefore, it is anticipated that the combined effect on airspace users would not be of greater significance than when the impacts are assessed in isolation.	N/A

15.15 POTENTIAL MONITORING REQUIREMENTS

156. No monitoring relevant to military and civil aviation is anticipated; however, any potential requirements such as monitoring the effectiveness of radar mitigation would be agreed with stakeholders prior to construction.

15.16 SUMMARY

157. **Table 15.19** presents a summary of the assessment of potential effects on military and civil aviation during the construction, O&M and decommissioning phases of the Project.

158. The assessment has established that the WDA infrastructure would result in effects of **minor adverse** significance only which is **not significant** in EIA terms.

Table 15.19 Summary of potential effects for military and civil aviation

Potential Impact	Receptor(s)	Relevant Embedded Mitigation Measures	Sensitivity	Magnitude of Impact	Significance of Effect	Additional Mitigation	Residual Significance of Effect	Proposed Monitoring	Combined Assessment	Cumulative Residual Significance of Effect
Construction										
Impact 1: Creation of an aviation obstacle environment	Offshore helicopter operations SAR missions Military low flying training operations	M-20, M-26, M-27, M-33, M-34, M-35, and M-49.	Medium	Low	Minor	N/A	Minor (Not significant)	N/A	No significant residual effects likely.	No potential for cumulative impacts therefore no significant cumulative effects.
	Islay Airport IFPs Tiree Airport IFPs	N/A	High	Medium	Major	Suitable revisions to IFPs to be prepared and implemented in accordance with the Airspace Change Process following consultation with HIAL.	Minor (Not significant)	N/A	No significant residual effects likely.	No potential for cumulative impacts therefore no significant cumulative effects.
Operation and Maintenance										
Impact 1: Creation of an aviation obstacle environment	Offshore helicopter operations SAR missions Military low flying training operations	M-20, M-26, M-27, M-33, M-34, M-35, and M-49.	Medium	Low	Minor	N/A	Minor (Not significant)	N/A	No significant residual effects likely.	No potential for cumulative impacts therefore no significant cumulative effects.
	Islay Airport IFPs Tiree Airport IFPs	N/A	High	Medium	Major	Suitable revisions to IFPs to be prepared and implemented in accordance with the Airspace Change Process following consultation with HIAL.	Minor (Not significant)	N/A	No significant residual effects likely.	No potential for cumulative impacts therefore no significant cumulative effects.
Impact 2: Increased air traffic in the area related to Project activities	Helicopter support operations Existing air traffic	N/A	Medium	Low	Minor	N/A	Minor (Not significant)	N/A	No significant residual effects likely.	No potential for cumulative impacts therefore no significant cumulative effects.
Impact 3: Impact on Civil PSR Systems	NERL Tiree PSR	N/A	High	Medium	Major	NATS has approved a radar technical mitigation solution that has also been approved by the MoD.	Minor (Not significant)	N/A	No significant residual effects likely.	Minor (Not significant)
Decommissioning										
Impact 1: Creation of an	Offshore helicopter operations	M-20, M-26, M-27, M-33, M-34, M-35,	Medium	Low	Minor	N/A	Minor (Not significant)	N/A	No significant residual effects likely.	No potential for cumulative impacts therefore no

Potential Impact	Receptor(s)	Relevant Embedded Mitigation Measures	Sensitivity	Magnitude of Impact	Significance of Effect	Additional Mitigation	Residual Significance of Effect	Proposed Monitoring	Combined Assessment	Cumulative Residual Significance of Effect
aviation obstacle environment	SAR missions Military low flying training operations	M-46, and M-49.								significant cumulative effects.
	Islay Airport IFPs Tiree Airport IFPs	N/A	High	Medium	Major	Suitable revisions to IFPs to be prepared and implemented in accordance with the Airspace Change Process following consultation with HIAL.	Minor (Not significant)	N/A	No significant residual effects likely.	No potential for cumulative impacts therefore no significant cumulative effects.

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