



Offshore Wind Power Limited

# West of Orkney Windfarm Offshore EIA Report

## Volume 1, Chapter 17 - Military and Aviation

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## 17 MILITARY AND AVIATION

### Chapter summary

This chapter of the Offshore Environmental Impact Assessment (EIA) Report assesses the potential effects from the offshore Project on military and aviation receptors. This includes direct, indirect, cumulative, whole Project assessment, cumulative, inter-related effects, inter-relationships, and transboundary effects.

The Option Agreement Area (OAA) is located approximately 12.4 nautical miles (nm) (23 kilometre (km)) off the north coast of Scotland and approximately 15 nm (28 km) west of Hoy, Orkney. Immediately to the west of the OAA is military Danger Area D801 (Cape Wrath), which is activated periodically, from the surface up to 55,000 ft and used for air to ground bombing exercises. MoD has confirmed that military operations within D801 will not be affected by the offshore Project. WTGs within the OAA are outside the safeguarding area of any civil airports and also outside the coverage of any civil Air Traffic Control (ATC) radars, military ATC/Air Defence radars or Met Office radars. An active Helicopter Main Route (HMR YANKEE) is located approximately 3 nm (6 km) outside the OAA however, helicopter operations on HMR YANKEE will not be affected by the WTGs within the OAA. HMR Yankee was specifically avoided in the selection of the OAA location. The offshore Project is also outside the consultation zones of any offshore helicopter installations although there is a helicopter landing pad located at Sule Skerry lighthouse approximately 3 nm (6 km) outside the northwest boundary of the OAA. Offshore Wind Power Limited (OWPL) consulted with Orbex, who will be responsible for development and operation of the Space Hub Sutherland located approximately 16 nm (30 km) south-southwest of the OAA. Construction of the facility began in July 2023 and the first launch events expected in 2024; the offshore Project is not expected to disrupt Space Hub Sutherland's operations.

The following impacts were identified as requiring assessment:

- Construction and decommissioning:
  - Potential impact on military low flying and United Kingdom (UK) Search and Rescue (SAR) helicopter operations due to presence of obstacles (Wind Turbine Generators (WTGs) in construction).
- Operation and maintenance:
  - Potential impact on military low flying and UK SAR helicopter operations due to presence of obstacles (WTGs in operation).

The assessment has taken account of embedded mitigation measures for the assessment of potential effects.

The offshore Project is not expected to affect any of the aviation receptors assessed with the exception that the WTGs which will create obstacles to military aircraft operating at low level and to SAR helicopters operating within the OAA in the event of a rescue mission. However, any potential impact will be alleviated through embedded mitigation measures including further engagement with the Ministry of Defence (MoD) and Maritime and Coastguard Agency (MCA) on the offshore Project of the specific WTG layout and implementation of an agreed Lighting and Marking Plan (LMP) that will need to be approved in consultation with the Civil Aviation Authority prior to the construction stage of the offshore Project (see Outline Plan (OP) 6: Outline lighting and marking plan). The overall impact is therefore judged not significant.

The location of the pre-assembly port(s) where WTGs, foundations and other infrastructure will be stored, part-assembled prior to being transported to the OAA, is currently undefined. Once confirmed, the locations and transport routes to the OAA will be communicated to Highland and Islands Airports Limited (HIAL) and further consultation will be carried out as to whether there could be any impact to Instrument Flight Procedures (IFPs). Additionally, any temporary obstacles associated with the Project, which are of more than 91.4 m in height will be alerted to aircrews by means of the Notice to Airmen (NOTAM) system.

No significant impacts to any military and aviation receptors are predicted, either for the offshore Project or cumulatively with other plans or developments.



## 17.1 Introduction

This chapter of the Offshore Environmental Impact Assessment (EIA) Report presents the military and aviation receptors of relevance to the offshore Project and assesses the potential impacts from the construction, operation and maintenance and decommissioning of the offshore Project on these receptors. Where required, mitigation is proposed, and the residual impacts and their significance are assessed. Potential cumulative and transboundary impacts are also considered.

The impact assessment presented herein draws upon information presented within other impact assessments within this Offshore EIA Report. Equally, the military and aviation impact assessment also informs other impact assessments. This interaction between the impacts assessed within different topic-specific chapters on a receptor is defined as an 'inter-relationship'. The chapters and impacts related to the assessment of potential effects on military and aviation are provided in Table 17-1.

*Table 17-1 Military and aviation inter-relationships*

CHAPTER	IMPACT	DESCRIPTION
<a href="#">Other sea users (chapter 20, Offshore EIA Report)</a>	Impacts on military Practice and Exercise Areas (PEXAs), and aerial activity associated with the Space Hub Sutherland.	The presence of military PEXAs and Areas of Intense Aerial Activity (AIAA), and aerial launches from Space Hub Sutherland.

Coleman Aviation Limited is the sole contributor to the military and aviation assessment and has prepared this Offshore EIA Report chapter.

## 17.2 Legislation, policy and guidance

Over and above the legislation presented in chapter 3: Planning policy and legislative context, the following legislation, policy and guidance are relevant to the assessment of impacts from the offshore Project on military and aviation:

- Legislation:
  - The Air Navigation Order (ANO) 2016 and Regulations made under the order; and defines the Rules of the Air regarding civil aviation in the United Kingdom (UK).
- Policy:
  - Civil Aviation Publication (CAP) 393 (Civil Aviation Authority (CAA), 2016a) – Air Navigation, The Order and the Regulations, (2016) (Version 6, 12<sup>th</sup> February 2021);
  - CAP 437 (CAA, 2021) – Standards for Offshore Helicopter Landing Areas (Version 8.2, 30<sup>th</sup> July 2021): Provides the criteria applied by the CAA in assessing the standards of offshore helicopter landing areas for worldwide use by helicopters registered in the UK;
  - CAP 670 (CAA, 2019) – Air Traffic Services (ATS) Safety Requirements (Issue 3, 7<sup>th</sup> June 2019): Sets out the safety regulatory framework and requirements associated with the provision of ATS;



- CAP 764 (CAA, 2016b) – CAA Policy and Guidelines on Wind Turbines (Version 6, February 2016): Provides CAA policy and guidance on a range of issues associated with Wind Turbine Generators (WTGs) and their effect on aviation that need to be considered by aviation stakeholders, wind energy developers and Local Planning Authorities (LPAs) when assessing the viability of WTG developments;
- CAP 774 (CAA, 2017) – The UK Flight Information Services (Version 4, 15<sup>th</sup> December 2021): Details the suite of ATS which (excluding aerodrome services) are the only services provided in Class G airspace within the UK Flight Information Region (FIR). This document is equally applicable to civilian and military pilots and air traffic controllers;
- Military Aviation Authority (MAA) (2021) - Regulatory Publication 3000 Series: Air Traffic Management Regulations (last updated 20<sup>th</sup> April 2021): Provides the regulatory framework and instructions to military personnel for provision of military Air Traffic Control (ATC); and
- MAA (2019) - Manual of Military Air Traffic Management (last updated 30<sup>th</sup> September 2019): Provides regulations for military ATC and emergency procedures and utilisation of military designated airspace.
- Guidance:
  - Obstruction Lighting Guidance (1<sup>st</sup> January 2020) Ministry of Defence (MoD) (2021): Sets out the MoD's minimum requirements and standards for installation of aviation lighting of onshore and offshore WTG developments;
  - 1:500,000 Visual Flight Rules (VFR) Aviation Chart CAA (2022a): Designed to assist in the navigation of aircraft. Enables pilots to determine their position, safe altitude and route to a destination, highlighting navigation aids along the way, alternative landing areas in case of an in-flight emergency, and other useful information such as radio frequencies and airspace boundaries;
  - CAP 168 (CAA, 2022b) – Licensing of Aerodromes (Version 12, 14<sup>th</sup> January 2022): Sets out the standards required at UK licensed aerodromes in terms of operational procedures, physical characteristics, assessment and treatment of obstacles, visual aids, rescue and fire-fighting services and medical services;
  - UK Integrated Aeronautical Information Package (UK IAIP) (CAA, 2022c): Provides comprehensive information on UK civilian aerodromes and aviation procedures within UK airspace;
  - UK Military Aeronautical Information Publication (UK Mil AIP) (MoD, 2022): Provides comprehensive information on UK military aerodromes and guidance to military aircrew on in-flight navigation procedures;
  - Offshore Renewable Energy Installations (OREI) SAR Requirements v3 (Version Nov 2021) (MCA, 2021): provides a description of the MCA policy, and guidance, advice and specific requirements (where seen as necessary) to assist and enable Search and Rescue (SAR), and other emergency response e.g. Counter Pollution and Salvage operations, to, within, and in the vicinity of OREI; and
  - Marine Guidance Note (MGN) 654 (UK Government, 2021) – Safety of Navigation: Offshore Renewable Energy Installations (OREIs), Guidance on UK Navigational Practice, Safety and Emergency Response (28<sup>th</sup> April 2021): Highlights issues with assessing the impact on navigational safety and emergency response caused by OREIs in UK internal waters.

### 17.3 Scoping and consultation

Stakeholder consultation has been ongoing throughout the EIA and has played an important part in ensuring the scope of the baseline characterisation and impact assessment are appropriate with respect to the Project and the requirements of the regulators and their advisors. The Scoping Report, which covered the onshore and offshore



Project, was submitted to Scottish Ministers (via Marine Scotland-Licensing Operations Team (MS-LOT<sup>1</sup>)) and The Highland Council (THC) on 1<sup>st</sup> March 2022<sup>2</sup>. MS-LOT circulated the Scoping Report to consultees relevant to the offshore Project and a Scoping Opinion was received on 29<sup>th</sup> June 2022. Relevant comments from the Scoping Opinion and other consultation specific to military and aviation are provided in Table 17-3 below, which provides a response on how these comments have been addressed within the Offshore EIA Report.

Further consultation has been undertaken throughout the pre-application stage. Table 17-2 summarises the consultation activities carried out that are relevant to military and aviation.

Table 17-2 Consultation activities for military and aviation

CONSULTEE AND TYPE OF CONSULTATION	DATE	SUMMARY
Space Hub Sutherland via Highlands and Islands Enterprise (HIE) – meeting	27 <sup>th</sup> October 2020	Meeting to introduce the Project and identify potential interaction with future space launch operations.
Highlands and Islands Airport Limited (HIAL) – meeting	19 <sup>th</sup> November 2020	Meeting to introduce the Project and discuss potential impact on HIAL operations; Offshore Wind Power Limited (OWPL) letter sent to HIAL on 21 <sup>st</sup> December 2022 in response to HIAL scoping response.
MoD- pre-application advice on the N1 PO (Ref DIO10052014) – meeting	July 2021	The MoD issued Pre-Application Advice on the N1 PO to the Project in July 2021 (Ref DIO10052014).
MoD – written communication	7 <sup>th</sup> October 2022	OWPL letter sent to MoD on 7 <sup>th</sup> October 2022 in response to MoD scoping response; MoD response to OWPL dated 17 <sup>th</sup> November clarifying MoD position.
Orbex (lead company for construction and operational management of Space Hub Sutherland) – meeting	8 <sup>th</sup> December 2022	Meeting to discuss space hub construction timelines and operational protocols potentially affecting the Project.
HIAL – written communication	21 <sup>st</sup> December 2022	OWPL wrote to HIAL on 21 <sup>st</sup> December 2022 providing SHP files on the site boundary and further information on the cable route options and landfall locations. HIAL confirmed that the Option Agreement Area (OAA) is outside of any safeguarding

<sup>1</sup> MS-LOT have since been renamed Marine Directorate - Licensing Operations Team (MD-LOT).

<sup>2</sup> The Scoping Report was also submitted to the Orkney Islands Council (OIC), as the scoping exercise included consideration of power export to the Flotta Hydrogen Hub, however, this scope is not covered in this Offshore EIA Reports and will be subject to separate Marine Licence and onshore planning applications.



CONSULTEE AND CONSULTATION	TYPE	OF DATE	SUMMARY
			<p>areas and as such no further assessment is required on airport Instrument Flight Procedures (IFPs).</p> <p>OWPL also requested an update on HIAL's ongoing work in development of ATC surveillance at HIAL airports.</p>
<b>CAA – written communication</b>		16 <sup>th</sup> February 2023	OWPL wrote to CAA providing an update on the offshore Project following scoping and to clarify whether there were any comments.
<b>National Air Traffic Services (NATS) – written communication</b>		16 <sup>th</sup> February 2023	Confirming that NATS have no safeguarding objections to the offshore Project.
<b>Northern Lighthouse Board (NLB) – written communication</b>		12 <sup>th</sup> May 2023	Following written correspondence, NLB confirmed that any disruption to NLB helicopters would be tolerable.
<b>HIAL – meeting</b>		31 <sup>st</sup> May 2023	Discussion around potential impacts to HIAL operations. HIAL confirmed that the OAA is outside of any airport safeguarding areas and as such no further assessment of IFPs is required. It was also agreed that further consultation will be undertaken post-consent once the pre-assembly port locations and the routes for the transport of turbines and jackets to the OAA are confirmed.



Table 17-3 Comments from the Scoping Opinion response relevant to military and aviation

CONSULTEE	COMMENT	RESPONSE
<p><b>Scottish Ministers (via MS-LOT)</b></p>	<p>The Scottish Ministers highlight the representations from National Air Traffic Services (NATS) and HIAL which have no objection to the Proposed Development on the basis that it does not conflict with the NATS or HIAL safeguarding criteria. However, this view is based solely on the information provided within the Scoping Report, therefore the Scottish Ministers advise that the HIAL and NATS must be consulted on any revised or amended information prior to submission of the EIA Report. This view is supported by HIAL, NATS and THC.</p>	<p>OWPL notes the representations of NATS and HIAL within the Scoping Report. Both parties have been advised of any revisions or amendments to the Project that could affect their operations.</p> <p>Potential impact on NATS and HIAL operations is presented within sections 17.4.4 and 17.5.2 of this chapter.</p>
<p><b>Scottish Ministers (via MS-LOT)</b></p>	<p>The Scottish Ministers are broadly content with the study area as defined in Figure 2-41 of the Scoping Report and that the baseline data gathered for the assessment is appropriate. The Scottish Ministers highlight the representation from British Telecom (BT) which states that the Proposed Development will likely cause interference to BT's current and presently planned radio network. The Developer must include the exact co-ordinates of the WTGs in the EIA Report to allow assessments to be made around clearance of any structure that passes BT's radio path.</p>	<p>OWPL note the comments of the Scottish Ministers on baseline data gathered for the Scoping Report. Comments regarding British Telecommunications (BT) are not covered in this chapter but are addressed in chapter 20: Other sea users.</p>
<p><b>Scottish Ministers (via MS-LOT)</b></p>	<p>In Table 2-65 of the Scoping Report the Developer summarises the potential impacts to Military and Aviation during all phases of the Proposed Development. The Scottish Ministers broadly agree with the impacts that are scoped into and out of the EIA Report. However, in line with the representations from NATS, HIAL and THC, the Scottish Ministers advise direct consultation with NATS Safeguarding and HIAL</p>	<p>OWPL have consulted with NATS and HIAL as part of the EIA process. Assessment of potential impact on NATS and HIAL operations is presented within sections 17.4.4 and 17.5.2 of this chapter.</p>



CONSULTEE	COMMENT	RESPONSE
	<p>is undertaken regarding the scope of the assessment. Additionally, the Scottish Ministers advise that if it is identified there are no predicted effects then this should still be recorded within the EIA Report.</p>	
<p><b>Scottish Ministers (via MS-LOT)</b></p>	<p>In Section 2.12.4.1.3 of the Scoping Report the Developer references the location of military and defence activity at Cape Wrath in relation to the Proposed Development. The Scottish Ministers direct the Developer to the representation from MoD and the concerns that it has expressed over the Proposed Development and the potential impact that it will have on military training activities held at Cape Wrath. The Scottish Ministers agree that this should be scoped in and advise that it is essential that further assessment is undertaken and that the concerns expressed by MoD are fully addressed within the EIA Report. For the avoidance of doubt, the Scottish Ministers note that any impact on the function and capability at Cape Wrath will result in an objection to the Proposed Development from MoD.</p>	<p>OWPL wrote to MoD on 7<sup>th</sup> October 2022 requesting further assessment of potential impact on operations at Cape Wrath. MoD responded on 17<sup>th</sup> November 2022 confirming that an assessment had been completed and that, as the offshore Project lies wholly out-with Danger Area D801 (Cape Wrath), the MoD has no concerns. As a result of this consultation, potential impact on military operations within Danger Area D801 (Cape Wrath) has been scoped out of the Offshore EIA Report; see section 17.5.2.</p>
<p><b>Scottish Ministers (via MS-LOT)</b></p>	<p>The Scottish Ministers would like to direct the Developer to the representation from MoD and advise it is necessary to consult with MoD in relation to the refinement of the cable route options and landfall locations. For completeness, the Scottish Ministers further highlight the MoD representation in relation to lighting and charting of WTGs.</p>	<p>OWPL wrote to MoD on 7<sup>th</sup> October 2022 providing further information on cable route options and landfall locations. MoD responded on 17<sup>th</sup> November 2022 confirming that the offshore Project will not impact upon MoD danger/exercise areas, defence maritime navigational interests or highly surveyed routes the MoD retains in the locality. As a result of this consultation, potential impact of cable routes and landfall locations on MoD operations has been scoped out of the EIA Report; see sections 17.4.4 and 17.5.2 of this chapter.</p> <p>Regarding aviation lighting, OWPL acknowledges that aviation safety lighting will need to be installed with MoD accredited lights to ensure compatibility with military aviation activity. Further detail on aviation</p>



CONSULTEE	COMMENT	RESPONSE
		lighting and marking is presented within section 17.5.4 and 17.6 of this chapter.
<p><b>Aberdeen Airport</b> (via MS-LOT Scoping Opinion)</p>	<p>Aberdeen Airport acknowledged that the Project was located outside the consultation area for the airport. No need to be consulted further.</p>	<p>No response required.</p>
<p><b>HIAL</b> (via MS-LOT Scoping Opinion)</p>	<p>With reference to the above request for a scoping opinion and following the supply of the OAA in shape file format; HIAL can confirm that the West of Orkney offshore windfarm does not impact the safeguarding criteria of any Highland and Islands Ltd Airport. Therefore, HIAL would not object to the windfarm based on the information received to date.</p> <p>HIAL also understand that the onshore wind turbine fabrication will be a separate consultation/s and planning application/s.</p>	<p>OWPL wrote to HIAL on 21<sup>st</sup> December 2022 providing further information on the cable route options and landfall locations. Further engagement regarding the potential impact to HIAL operations was held with HIAL on the 31<sup>st</sup> May 2023. HIAL confirmed that the OAA is outside of any airport safeguarding areas and as such no further assessment of IFPs is required. It was also agreed that further consultation will be undertaken post-consent once the pre-assembly port locations and tow routes the OAA (for structures higher than 91.4 m) are confirmed.</p> <p>As a result of this consultation, potential impact on HIAL airport IFPs has been scoped out of the Offshore EIA Report.</p>
<p><b>HIAL</b> (via MS-LOT Scoping Opinion)</p>	<p>HIAL requested to be supplied with the boundary of the proposed development in the form of a KML or SHP file format to verify the statement: The nearest major civil airports to the OAA are Kirkwall Airport at 31 nm (56 km) and Wick Airport at 38 nm (69 km) both of which are operated by HIAL. As the proposed Project's WTGs are outside the safeguarding area for both airports, coupled with the subsea nature of the export cables (located within the export cable search areas) this means that there will no impact on these airports' Instrument Flight Procedures (IFPs).</p>	<p>OWPL wrote to HIAL on 21<sup>st</sup> December 2022 providing SHP files on the site boundary and further information on the cable route options and landfall locations.</p> <p>Further engagement regarding the potential impact to HIAL operations was held with HIAL on the 31<sup>st</sup> May 2023. HIAL confirmed that the OAA is outside of any airport safeguarding areas and as such no further assessment of IFPs is required. It was also agreed that further consultation will be undertaken post-consent once the pre-assembly port locations and tow routes the OAA (for structures higher than 91.4 m) are confirmed.</p>



CONSULTEE	COMMENT	RESPONSE
<p><b>HIAL</b> (via MS-LOT Scoping Opinion)</p>	<p>HIAL pointed out that the WTGs would be fabricated onshore and transported to the array area for installation but that the onshore fabrication area(s) had not been identified. HIAL were concerned that the WTG fabrication areas and WTG transport from the fabrication area to the offshore area could be within airspace coincidental with any published Instrument Flight Procedure (IFP). (CAP764 – Preplanning &amp; Consultation).</p>	<p>OWPL wrote to HIAL on 21<sup>st</sup> December 2022 providing SHP files on the site boundary and further information on the cable route options and landfall locations. HIAL confirmed that the OAA is outside of any safeguarding areas and as such no further assessment is required on airport IFPs.</p> <p>The location of the pre-assembly port(s) (where WTGs, foundations and other infrastructure will be stored, part-assembled and transported to the OAA) is currently undefined. Once confirmed, the locations and tow routes the OAA (for structures higher than 91.4 m) will be communicated to HIAL and further consultation will be carried out on whether there could be any impact to IFPs. This was agreed with HIAL on 31<sup>st</sup> May 2023.</p>
<p><b>MoD</b> (via MS-LOT Scoping Opinion)</p>	<p>The use of airspace in the vicinity of the proposed development for defence purposes has been appropriately identified. The scoping report highlights some of the aviation and radar systems that may be affected by the proposed wind farm and the MoD is identified as a relevant receptor in Chapter 2.10 Military and Aviation of the scoping report.</p>	<p>OWPL acknowledges MoD's confirmation that principal defence and the use of airspace in the vicinity of the proposed offshore Project for defence purposes has been appropriately identified.</p>
<p><b>MoD</b> (via MS-LOT Scoping Opinion)</p>	<p>The report identifies that the proposed turbines will not affect or be detectable to any Primary Surveillance Radars (PSR), whether military or civilian, in the wider region and have therefore been scoped out. The report also notes that the development would have no impact on the operation and capability of any Air Defence Radars (ADR), this has also been scoped out.</p>	<p>OWPL acknowledge the MoD's confirmation that PSRs and ADR will not be impacted. As a result, potential impact on MoD ATC and AD radars has been scoped out of the Offshore EIA Report.</p>
<p><b>MoD</b></p>	<p>Impact on military activity has been recognised in 2.12.4.1.3 of the scoping report. The designated site areas, as shown on figure 2-49,</p>	<p>Further consultation was undertaken with the MoD who confirmed on the 17<sup>th</sup> November 2022 that as the Project lies wholly out-with D801 Cape</p>



CONSULTEE	COMMENT	RESPONSE
<p>(via MS-LOT Scoping Opinion)</p>	<p>overlaps four military Practice and Exercise Areas (PEXA). The scoping report identifies that the development has the potential to impact on local airspace restriction specifically military danger area D801 Cape Wrath. Cape Wrath Training Area provides opportunities for a wide range of field fire and dry training exercises and is the only range in Europe where land, air, and sea training activities can be conducted simultaneously and heavy ordnance, including live 1000lb bombs, can be used. Wind turbines have the potential to present an obstacle and danger to military aircraft and vessels operating/navigating within this area which might be engaged in live firing activity or high energy maneuvers. Further assessment will be essential to determine the potential for this development to limit or otherwise restrict defence activity at Cape Wrath. Any scheme that would impact on the function and capability at Cape Wrath will result in an objection from MoD.</p>	<p>Wrath (whilst noting that it immediately abuts the eastern PEXA boundary), the MoD has no concerns.</p>
<p>MoD (via MS-LOT Scoping Opinion)</p>	<p>The MoD also has highly surveyed navigational routes in the vicinity which we would need to take into consideration when reviewing any development proposal.</p>	<p>Further consultation was undertaken with the MoD who confirmed on the 17<sup>th</sup> November 2022 that the details of the Project that were provided will not impact upon MoD danger/exercise areas, defence maritime navigational interests or the highly surveyed routes the MoD retains in the locality</p>
<p>MoD (via MS-LOT Scoping Opinion)</p>	<p>Impact on military low flying has been scoped in and the applicant states in the scoping report that they are committed to lighting and charting the turbines. In the interests of air safety, the MoD would request that the development be fitted with MoD accredited aviation safety lighting in accordance with the Civil Aviation Authority, Air Navigation Order 2016.</p>	<p>OWPL acknowledges that aviation safety lighting will need to be installed with MoD accredited lights to ensure compatibility with military aviation activity. Further detail on aviation lighting and marking is presented within section 17.5.4 of this chapter.</p>



CONSULTEE	COMMENT	RESPONSE
<p><b>MoD</b> (via MS-LOT Scoping Opinion)</p>	<p>MoD acknowledge that this consultation request relates to the proposed Section 36 consent and Marine Licence applications and not the onshore elements of the works. MoD request that we are consulted once more detail is available relating to the cable route and onshore landfall location.</p>	<p>MoD were consulted further with regards to the cable route and landfall location.  A response was received on the 17<sup>th</sup> November 2022 that the details of the Project that were provided will not impact upon MoD danger/exercise areas, defence maritime navigational interests or the highly surveyed routes the MoD retains in the locality.</p>
<p><b>NATS</b> (via MS-LOT and THC Scoping Opinions)</p>	<p>The proposed development has been examined from a technical safeguarding aspect and does not conflict with our safeguarding criteria. Accordingly, NATS (En Route) Public Limited Company ("NERL") has no safeguarding objection to the proposal.</p>	<p>OWPL acknowledges NATS' comment. As a result, potential impact on NATS infrastructure (including ATC radars) has been scoped out of the Offshore EIA Report.</p>
<p><b>NATS</b> (via MS-LOT and THC Scoping Opinions)</p>	<p>However, please be aware that this response applies specifically to the above consultation and only reflects the position of NATS (that is responsible for the management of en route air traffic) based on the information supplied at the time of this application. This letter does not provide any indication of the position of any other party, whether they be an airport, airspace user or otherwise. It remains your responsibility to ensure that all the appropriate consultees are properly consulted.</p>	<p>Noted. NATS have been consulted during the EIA process and have confirmed that there are no safeguarding objections to the offshore Project (16<sup>th</sup> February 2023).  Other aviation consultees have been consulted as part of the EIA process.</p>
<p><b>NATS</b> (via MS-LOT and THC Scoping Opinions)</p>	<p>If any changes are proposed to the information supplied to NATS in regard to this application which become the basis of a revised, amended or further application for approval, then as a statutory consultee NERL requires that it be further consulted on any such changes prior to any planning permission or any consent being granted.</p>	<p>NATS have been consulted during the EIA process and have confirmed that there are no safeguarding objections to the offshore Project (16<sup>th</sup> February 2023).</p>



CONSULTEE	COMMENT	RESPONSE
<p><b>THC</b> <b>(via MS-LOT Scoping Opinion)</b></p>	<p>The EIA Report needs to recognise community assets that are currently in operation for example TV, radio, tele-communication links, aviation interests including radar, MoD safeguards, etc. In this regard the applicant, when submitting a future application, will need to demonstrate what interests they have identified and the outcomes of any consultations with relevant authorities such as Ofcom, NATS, BAA, CAA, MoD, Highlands and Islands Airports Ltd, etc.</p> <p>We consider the results of these surveys should be contained within the EIAR to determine whether any suspensive conditions are required in relation to such issues.</p> <p>However, it is noted that HIAL do not consider that Civil Airport patterns and procedures can be scoped out and that an Aviation Impact Feasibility Study should be produced as part of the EIA.</p> <p>Given the NATS response it is recommended direct liaison takes place with NATS on the scope of the assessment however it has advised that it would have no objection from a safeguarding point of view.</p>	<p>Details of consultation with relevant aviation authorities are contained within this table.</p> <p>Regarding HIAL’s concerns about scoping out Civil Airport patterns and procedures, OWPL wrote to HIAL on 21<sup>st</sup> December 2022 providing SHP files on the site boundary and further information on the cable route options and landfall locations. Further engagement regarding the potential impact to HIAL operations was held with HIAL on the 31<sup>st</sup> May 2023. HIAL confirmed that the OAA is outside of any airport safeguarding areas and as such no further assessment of IFPs is required. It was also agreed that further consultation will be undertaken post-consent once the pre-assembly port locations are confirmed.</p> <p>The location of the pre-assembly port(s) (where WTGs, foundations and other infrastructure will be stored, part-assembled and transported to the OAA) is currently undefined. Once confirmed, the locations will be communicated to HIAL and further consultation will be carried out on whether there could be any impact to IFPs. This was agreed with HIAL on 31<sup>st</sup> May 2023.</p> <p>Further consultation has been undertaken with NATS (16<sup>th</sup> February 2023) and it has been confirmed there are no objections from a safeguarding perspective.</p> <p>Airports that are relevant to the Project i.e. Aberdeen, have been contacted directly and have confirmed that they will not be affected by the Project.</p>



## 17.4 Baseline characterisation

This section outlines the current baseline for military and aviation within the military and aviation offshore study area.

Information on military and aviation was collected through a detailed desktop review of existing studies and datasets; these are summarised in Table 17-4.

The desktop review was conducted using comprehensive aviation documentation and charts to identify potential aviation receptors during the construction, operation and maintenance, and decommissioning stages of the offshore Project. Supporting information was also drawn from a review of data sources; in particular the UK IAIP and consultee responses as outlined in Table 17-3.

### 17.4.1 Study area

The military and aviation offshore study area has been determined by the presence of potentially affected aviation receptors; in particular, ATC and Air Defence (AD) PSRs.

The military and aviation offshore study area includes any radars that could potentially detect WTGs within the OAA; with the extent of the military and aviation offshore study area defined by the furthest potential aviation receptor. The operating range of these radars can be up to 200 nautical miles (nm) (370 kilometres (km)); however, as WTG visibility to radar is the determining factor relating to potential impact on PSR systems, only radars that have coverage over the OAA will be considered in the assessment. This ensures that only the relevant radars, and stakeholders, affected by the offshore Project are identified.

The military and aviation offshore study area also considers airspace designations including Low Flying Areas (LFA) and military practice areas in the immediate vicinity of the offshore Project; and airspace, as necessary, used by fixed-wing aircraft or helicopters operating on Helicopter Main Routes (HMR) in the vicinity of the OAA. Figure 17-1 displays all aeronautical information within the bounds of the figure, however, only airspace designations relevant to the offshore Project are labelled.

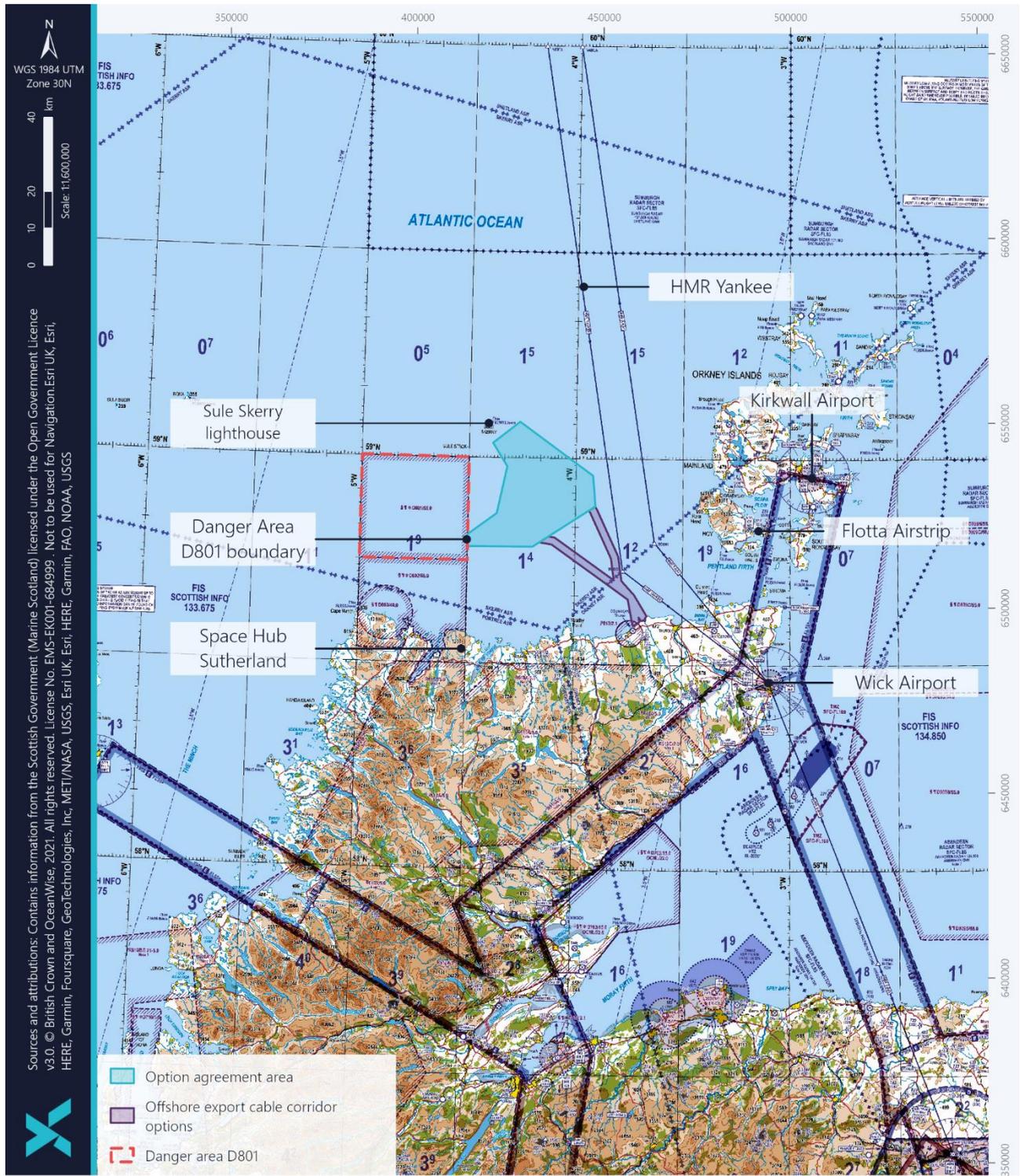


Figure 17-1 Military and aviation study area and location of aviation receptors



## 17.4.2 Data sources

The existing data sets and literature with relevant coverage, which have been used to inform the baseline characterisation for the offshore Project are outlined in Table 17-4.

The assessment of impacts on military and aviation was a desk-based exercise making use of existing studies and datasets. The desktop review was conducted using comprehensive aviation documentation and charts to identify potential aviation receptors during the construction, operation and maintenance, and decommissioning stages of the offshore Project. Supporting information was also drawn from a review of data sources; in particular, the UK IAIP and consultee responses as outlined in Table 17-3

Table 17-4 Summary of key datasets and reports

TITLE	SOURCE	YEAR	AUTHOR
CAA 1:500,000 VFR Aviation Chart	<a href="https://transair.co.uk/charts-and-guides/caa-1500-000-charts">https://transair.co.uk/charts-and-guides/caa-1500-000-charts</a>	2023	CAA
Helideck Certification Agency (HCA) database	<a href="https://www.helidecks.org/information/">https://www.helidecks.org/information/</a>	2023	HCA
NATS Self-Assessment Maps	<a href="https://www.nats.aero/services-products/catalogue/n/wind-farms-self-assessment-maps/">https://www.nats.aero/services-products/catalogue/n/wind-farms-self-assessment-maps/</a>	2023	NATS
UK IAIP	<a href="https://nats-uk.ead-it.com/cms-nats/opencms/en/Publications/AIP/">https://nats-uk.ead-it.com/cms-nats/opencms/en/Publications/AIP/</a>	2022c	CAA
UK Mil AIP	<a href="https://www.aidu.mod.uk/aip/">https://www.aidu.mod.uk/aip/</a>	2022	MoD
Scottish Government Sectoral Marine Plan for Offshore Wind Energy	<a href="https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2020/10/sectoral-marine-plan-offshore-wind-energy/documents/sectoral-marine-plan-offshore-wind-energy/sectoral-marine-plan-offshore-wind-energy/govscot%3Adocument/sectoral-marine-plan-offshore-wind-energy.pdf">https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2020/10/sectoral-marine-plan-offshore-wind-energy/documents/sectoral-marine-plan-offshore-wind-energy/sectoral-marine-plan-offshore-wind-energy/govscot%3Adocument/sectoral-marine-plan-offshore-wind-energy.pdf</a>	2020	Scottish Government
HIAL Air Traffic Management Strategy 2030	<a href="https://www.hial.co.uk/downloads/file/449/atms-pre-tender-market-consultation-may-2018#:~:text=The%20E2%80%98ATM%20Strategy%202030%E2%80%99%20is%20HIAL%E2%80%99s%20mid%20to%20cost%20effective%2C%20and%20more%20environmentally%20friendly%20airspace%20environment">https://www.hial.co.uk/downloads/file/449/atms-pre-tender-market-consultation-may-2018#:~:text=The%20E2%80%98ATM%20Strategy%202030%E2%80%99%20is%20HIAL%E2%80%99s%20mid%20to%20cost%20effective%2C%20and%20more%20environmentally%20friendly%20airspace%20environment</a>	2018	HIAL



TITLE	SOURCE	YEAR	AUTHOR
<b>Beatrice Offshore Windfarm Ltd (BOWL) Environmental Statement (ES)</b>	<a href="https://marine.gov.scot/data/beatrice-offshore-wind-farm-06145-environmental-report">https://marine.gov.scot/data/beatrice-offshore-wind-farm-06145-environmental-report</a>	2012	BOWL
<b>Moray East Offshore Windfarm (Moray East) ES</b>	<a href="https://www.morayeast.com/document-library/navigate/229/144">https://www.morayeast.com/document-library/navigate/229/144</a>	2012	Moray East
<b>Moray West Offshore Windfarm (Moray West) EIA Report</b>	<a href="https://marine.gov.scot/data/moray-west-offshore-windfarm-environmental-impact-assessment-report">https://marine.gov.scot/data/moray-west-offshore-windfarm-environmental-impact-assessment-report</a>	2018	Moray West
<b>Pentland Floating Offshore Windfarm (PFOWF) EIA Report</b> <i>(Note: Supersedes Dounreay Tri ES 2016)</i>	<a href="https://marine.gov.scot/node/22753">https://marine.gov.scot/node/22753</a>	2022	Highland Wind Limited

### 17.4.3 Project site-specific surveys

No site-specific surveys have been undertaken to inform the EIA for military and aviation. This is because the baseline characterisation developed through existing data sources, coupled with ongoing consultation with relevant stakeholders, is considered sufficient to inform the military and aviation impact assessment.

### 17.4.4 Existing baseline

A review of literature and available data sources (Table 17-4), augmented by consultation (Table 17-3), has been undertaken to describe the current baseline environment for military and aviation. The key military and aviation receptors potentially impacted by offshore windfarms are:

- Civil airport IFPs;
- Military aerodrome IFPs;
- Civil ATC radar;
- Military ATC radar;
- Military AD radar;
- Low flying Areas (including SAR);
- HMRs;
- Offshore helicopter installations (oil and gas platforms / lighthouse helipads);
- Local Airspace Restrictions (Danger Areas and Military PEXAs);
- Meteorological (Met) Office radar; and
- Space Hub Sutherland.

There are a number of civilian and military aviation interests within the vicinity of the offshore Project (see Figure 17-1) and can be described as follows:



### 17.4.4.1 Airspace

The OAA is located approximately 12.4 nm (23 km) off the north coast of Scotland and approximately 15 nm (28 km) west of Hoy, Orkney. In aviation terms, the offshore Project environment is situated in a relatively uncomplicated piece of airspace.

In the UK Flight Information Region, airspace is classified as A to G in accordance with International Civil Aviation Organisation (ICAO) standards (there is no airspace designated as Class B or Class F in the UK). Airspace Classes A, C, D and E are variants of controlled airspace within which aircraft generically require an ATC clearance to operate. The offshore Project is situated in an area of Class G uncontrolled airspace which is established from the surface up to Flight Level (FL) 195 (19,500 feet (ft)) above which is Class C controlled airspace.

Within Class G and C airspace, the following ATC rules apply:

- Class G airspace - any aircraft can operate in this area of uncontrolled airspace without any mandatory requirement to be in communication with, or receive a radar service from, any ATC unit. Pilots of aircraft operating under VFR in Class G airspace are ultimately responsible for seeing and avoiding other aircraft and obstructions; and
- Class C Airspace. Aircraft operating within Class C controlled airspace (i.e. above FL 195) must be in receipt of an ATS from NERL or a separate authorised military service provider.

### 17.4.4.2 Civil airports

The nearest civil airports to the OAA are Kirkwall Airport at 31 nm (56 km) and Wick Airport at 38 nm (69 km), both of which are operated by HIAL. The offshore Project's WTGs are outside the safeguarding area for both airports and the sub-sea nature of the offshore export cables (located within the offshore Export Cable Corridor (ECC)), means that the offshore Project itself will not impact on these airports' IFPs.

### 17.4.4.3 Civil ATC radars

No existing civil ATC radars will be affected by the offshore Project's WTGs; as confirmed in the NATS scoping response (Table 17-3). However, in terms of future operations, HIAL announced in 2018 their proposed Air Traffic Management Strategy 2030 which potentially involves implementation of a combined surveillance system at several HIAL airports; including Wick Airport. This is something that has been continuously monitored by OWPL and following consultation with HIAL (Table 17-3), the type, location and timescale for a future surveillance system are not yet decided.

### 17.4.4.4 Military ATC and AD radars

No military ATC or AD radars will be affected by the offshore Project WTGs; as confirmed in the MoD scoping response (Table 17-3).



#### 17.4.4.5 Low Flying (including UK SAR)

The OAA is located in LFA 14, which covers Scotland to the north of the Scottish central belt. Military aircraft can fly down to a minimum of 250 feet (ft) (~76 m) above ground level (agl) throughout the LFA. Helicopters normally operate down to 100 ft (~30 m) agl but due to the nature of their task, and for specific training purposes, are occasionally permitted to fly lower.

When conducting an operational mission, UK SAR helicopters are not constrained by the normal rules of the air and operate in accordance with their Aircraft Operator Certificate (AOC), which allows them flexibility to manoeuvre, as required, for the particular mission being carried out.

#### 17.4.4.6 HMRs

HMR YANKEE is the nearest HMR to the offshore Project, located approximately 3 nm (6 km) outside the eastern boundary of the OAA (see Figure 17-1). HMR YANKEE is used by helicopters transiting between Aberdeen, via Wick to the Atlantic Rim offshore installations west of the Shetland Islands. Helicopters normally fly at 1,500 ft (457 m) or above; however, in some weather conditions, they may wish to fly at less than 1,500 ft (457 m), which is when obstacle clearance from tall structures such as WTGs can become an issue.

#### 17.4.4.7 Offshore helicopter installations (oil and gas platforms/lighthouse helipads)

The CAA recommend that windfarm developers consult with the owners/operators of offshore helicopter installations when the development is within 9 nm (17 km) of a potential wind farm development. No oil and gas platforms are within 9 nm of the OAA boundaries.

Sule Skerry lighthouse is located approximately 3 nm (6 km) outside the northwest boundary of the OAA. The lighthouse is unmanned but is serviced by approximately 3-4 helicopter flights per year to enable maintenance work to be undertaken without the need for sea landings. Review of the HCA website revealed that a Helicopter Landing Certificate has not been issued for low-visibility procedures into the lighthouse's helipad indicating that helicopter approaches are only flown under VFR. The NLB, who operate the lighthouse, did not provide comment in their scoping response regarding helicopter operations however, consultation with NLB since then has confirmed that the Project will have minimal impact on helicopter operations into Sule Skerry; see section 17.3

#### 17.4.4.8 Local Airspace Restrictions (Danger Areas and Military PEXAs)

The offshore Project lies underneath Danger Areas D712B/C which form part of the Northern Managed Danger Area (MDA) complex established from FL 245 (24,500 ft) up to FL 660 (66,000 ft). Distinct areas within the Northern MDA are activated when required by MoD. Promulgated activity within the Northern MDA includes air combat and training exercises and supersonic flight.

Immediately to the west of the OAA is military Danger Area D801 (Cape Wrath), which is activated periodically from the surface up to FL 550 (55,000 ft). It is the only range in Europe where land, air, and sea training activities can be conducted simultaneously and where heavy ordnance, including live 1000lb bombs, can be used for air to ground bombing exercises. The OAA's western boundary abuts the eastern boundary of D801. As the offshore Project's WTGs are outside the lateral boundaries of D801, MoD operations within the Danger Area will not be affected; see Table 17-3.



#### 17.4.4.9 Met Office Radar

The closest Met Office radar systems are located at Druim a'Starraig near Stornoway, Isle of Lewis and Hill of Dudwick near Ellon, Aberdeenshire. They are located more than 150 km from the OAA which is outside the 20 km safeguarding area for radars of this nature.

#### 17.4.4.10 Space Hub Sutherland

While not specifically an aviation or military receptor, baseline information on Space Hub Sutherland has been provided to ensure a full understanding of potential interactions. Further information and assessment is provided within chapter 20: Other sea users.

Space Hub Sutherland is located on the A' Mhòine peninsula, Sutherland approximately 16 nm (30 km) south-southwest of the OAA. Space Hub Sutherland was granted planning approval by THC in August 2020 and Orbex were appointed to lead construction and operational manager of the spaceport in November 2022. Construction commenced in July 2023 with the first space launch expected in 2024; launches are capped at 12 per year. Consultation with Space Hub Sutherland (section 17.3) indicates that a launch exclusion zone will have to be initiated within 1-2 hours of the space vehicle being fuelled on the launch pad and there will be restrictions in place for the launch corridor to ensure human safety in the event of a technical failure (but not including unmanned vehicles or installations). Orbex have confirmed that a temporary exclusion zone during launches over the sea will only be exercised during launch stages and that aviation and marine operators will be notified via Notice to Airmen (NOTAM) and Notice to Mariners (NtM). OWPL's discussions with Orbex indicate that operation of the proposed Project is not expected to disrupt Space Hub Sutherland's operations. However, OWPL will develop internal procedures to ensure that personnel working within the offshore Project remain outside temporary exclusion zones, or take appropriate safety measures, during launch sequences (expected to be once a month).

#### 17.4.5 Future baseline

Currently, there are no planned changes to the airspace environment that are expected to affect any future baseline for military and aviation. Therefore, the future baseline for military and aviation is not expected to differ from the current baseline as presented in section 17.4.4.

#### 17.4.6 Summary and key issues

The key sensitive military and aviation receptors identified from the baseline characterisation study, that are the focus of the impact assessment are potential impact on military low flying and UK SAR helicopter operations.

Potential receptors and impacts scoped into the assessment and impacts scoped out are provided in section 17.5 along with justification.

#### 17.4.7 Data limitations and uncertainties

The data used in this chapter are detailed in section 17.4.2. The data used are the most up to date publicly available information which can be obtained from the applicable data sources as cited. Data has also been provided through



consultation, as detailed in Table 17-2. It is considered that the data employed in the assessment are robust and sufficient for the purposes of the impact assessment presented.

## 17.5 Impact assessment methodology

### 17.5.1 Impacts requiring assessment

The impacts identified as requiring consideration for military and aviation are listed in Table 17-5. Information on the nature of impact (i.e. direct or indirect) is also described.

Table 17-5 Impacts requiring assessment for military and aviation

POTENTIAL IMPACT	NATURE OF IMPACT
Construction (including pre-construction) and decommissioning	
Potential impact on military low flying and UK SAR helicopter operations due to presence of obstacles (WTGs in construction).	Direct
Operation and maintenance	
Potential impact on military low flying and UK SAR helicopter operations due to presence of obstacles (WTGs in operation).	Direct
Decommissioning*	
No impacts identified.	N/A

*\* In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during the decommissioning of the offshore Project are considered analogous with, or likely less than, those of the construction stage. Where this is not the case, decommissioning impacts have been listed separately and have been assessed in section 17.6.3.*

### 17.5.2 Impacts scoped out of the assessment

The impacts scoped out of the assessment during EIA scoping, and the justification for this, are listed in Table 17-6.

Certain impacts were originally scoped into the assessment within the EIA Scoping Report, however following consultation (as outlined in section 17.3) with the relevant consultees, it has been confirmed that no further assessment is required. These impacts are:



- Impact on offshore helicopter installations (oil and gas platforms/lighthouse helipads) - NLB who operate the Sule Skerry lighthouse, were consulted and have confirmed that the offshore Project will have minimal impact on helicopter operations into Sule Skerry; see section 17.3. Consequently, this impact has been scoped out of further assessment;
- Impact on Local Airspace Restrictions (Danger Areas and Military PEXAs) – the MoD confirmed that the offshore Project will not impact upon any MoD danger/exercise areas, defence maritime navigational interests or highly surveyed routes; and
- Space hub Sutherland – consider not to be directly relevant to military or aviation receptors, further assessment is provided within chapter 20: Other sea users.

It should be noted that potential impact on aircraft due to the presence of physical obstacles needs to be mitigated and resolved prior to commencement of the construction stage (i.e. before newly installed WTGs become obstacles to aircraft in flight). Also, that potential adverse effects on radar systems are only possible if the WTGs blades are moving; consequently, impacts on radar systems are applicable to the operation and maintenance stage only.

Table 17-6 Impacts scoped out for military and aviation

IMPACT SCOPED OUT	JUSTIFICATION
Construction	
<p><b>Impact of WTGs on civil airport IFPs</b></p>	<p>The OAA is outside the consultation distance for any airport IFPs. Consequently, this impact does not require further assessment and has been scoped out of further assessment.</p> <p>The location of the pre-assembly port(s) (where WTGs, foundations and other infrastructure will be stored, assembled and transported to the OAA) is currently undefined. Once confirmed, the locations will be communicated to HIAL and further consultation will be carried out on whether there could be any impact to IFPs. This was agreed with HIAL on 31<sup>st</sup> May 2023.</p>
<p><b>Impact of WTGs on military aerodrome IFPs</b></p>	<p>The offshore Project is outside the consultation distance for any military aerodrome IFPs. Consequently, no military aerodrome IFPs would be affected by the offshore Project and this impact has been scoped out of further assessment.</p>
<p><b>Impact of WTGs on HMRS</b></p>	<p>HMR YANKEE is the nearest HMR to the OAA, located approximately 3 nm (6 km) outside the eastern boundary of the OAA. CAA guidance is that, where possible, 2 nm (4 km) either side of a HMR should be kept obstacle-free; consequently, helicopter operations on HMR YANKEE will not be affected by WTGs within the OAA. Although the ground-track of HMR YANKEE is close to the lateral boundaries of the offshore ECC, the sub-sea nature of the export cables means that helicopter operations on HMR YANKEE will not be affected.</p>
<p><b>Impact on offshore helicopter installations (oil and gas platforms/lighthouse helipads)</b></p>	<p>No oil and gas platforms are located within 9 nm (17 km) of the offshore Project, which is the distance at which the CAA recommend that windfarm developers consult with offshore helicopter installation operators.</p> <p>Sule Skerry lighthouse helipad is located approximately 3 nm (6 km) outside the northwest boundary of the OAA. However, review of the HCA website revealed that a Helicopter Landing Certificate has not been issued for low-visibility procedures into the lighthouse’s helipad</p>



IMPACT SCOPED OUT	JUSTIFICATION
	<p>indicating that helicopter approaches to the lighthouse are only be flown under VFR (i.e. good weather conditions). NLB, who operate the lighthouse, were consulted and have confirmed that the offshore Project will have minimal impact on helicopter operations into Sule Skerry; see 17.3. Consequently, this impact has been scoped out of further assessment.</p>
<p><b>Impact on Local Airspace Restrictions (Danger Areas and Military PEXAs)</b></p>	<p>The OAA lies underneath Danger Areas D712B/C which are established from FL 245 (24,500 ft) up to FL 660 (66,000 ft) periodically by MoD. The OAA's western boundary also abuts the boundary of military Danger Area D801 (Cape Wrath), which is activated periodically, from the surface up to FL 550 (55,000 ft), for air to ground bombing exercises. OWPL wrote to MoD on 7<sup>th</sup> October 2022 (Table 17-2) requesting further assessment of any impact on Danger Area D801 (Cape Wrath). MoD responded on 17<sup>th</sup> November 2022 (Table 17-2) confirming that the offshore Project will not impact upon any MoD danger/exercise areas, defence maritime navigational interests or highly surveyed routes. Consequently, no further assessment is required and this impact has been scoped out.</p>
<p>Operation and maintenance</p>	
<p><b>Impact on civil ATC radars</b></p>	<p>NATS and HIAL confirmed in their scoping/consultation responses (Table 17-2) that no civilian ATC radar systems would be affected by the offshore Project. Consequently, this impact has been scoped out of further assessment.</p>
<p><b>Impact on military ATC and AD radars</b></p>	<p>MoD confirmed in their scoping response (Table 17-2) that no military ATC and AD radar systems would be affected by the offshore Project. Consequently, this impact has been scoped out of further assessment.</p>
<p><b>Impact on meteorological radar systems</b></p>	<p>The presence of WTGs can create challenges to meteorological radars due to the rotating blades. Impacts to meteorological radars range from contamination of the quality of the radar data to loss of meteorological data altogether. More specifically, the presence of WTGs in Radar Line of Sight (RLOS) can create significant types of interference to weather radar data. However, WTGs need to be in RLOS and in the beam of the radar at its lowest elevation to have an impact on meteorological radars. Given that the nearest meteorological radar is located more than 150 km from the OAA, generously outside the 20 km safeguarding area for radars of this nature, it can be assessed that the offshore Project will not have any adverse impact on meteorological radars. Consequently, this impact has been scoped out of further assessment.</p>

### 17.5.3 Assessment methodology

An assessment of potential impacts is provided separately for the construction, operation and maintenance and decommissioning stages.

The assessment for military and aviation is undertaken following the principles set out in chapter 7: EIA methodology. The sensitivity of the receptor is combined with the magnitude to determine the impact significance. In the absence of aviation-specific policy for defining sensitivity and magnitude, criteria for each are assigned based on professional judgement, as described in Table 17-7 and Table 17-8.



Table 17-7 Sensitivity criteria

SENSITIVITY OF RECEPTOR	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 offshore 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 offshore 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 offshore Project and/or has high recoverability.
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 offshore Project and/or has high recoverability.

Table 17-8 Magnitude criteria

MAGNITUDE CRITERIA	DEFINITION
High	Total loss of ability to carry on activities and/or impact is of extended physical extent and/or long term duration (i.e. total life of offshore Project and/or frequency of repetition is continuous and/or effect is not reversible).
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 (i.e. operational period) and/or frequency of repetition is medium to continuous and/or effect is not reversible.
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 (i.e. construction period) and/or frequency of repetition is low to continuous and/or effect is not reversible.
Negligible	Very slight change from baseline condition and/or physical extent of impact is negligible and/or short term duration (i.e. less than two years) and/or frequency of repetition is negligible to continuous and/or effect is reversible.



The consequence and significance of effect is then determined using the matrix provided in chapter 7: EIA methodology.

## 17.5.4 Embedded mitigation

As described in chapter 7: EIA methodology, certain measures have been adopted as part of the Project development process in order to reduce the potential for impacts to the environment, as presented in Table 17-9. These have been accounted for in the assessment presented below. The requirement for additional mitigation measures (secondary mitigation) will be dependent on the significance of the effects on military and aviation receptors.

Table 17-9 Embedded mitigation measures relevant to military and aviation

MITIGATION MEASURE	FORM (PRIMARY OF TERTIARY)	DESCRIPTION	HOW MITIGATION WILL BE SECURED
Site selection	Primary	The OAA was selected to avoid the Yankee Main Helicopter Route and 2 nm (4 km) buffer.	Already secured through OAA boundary.
Lighting and marking as appropriate for the final agreed layout	Primary	Approval and implementation of a Lighting and Marking Plan (LMP), which will set out specific requirements in terms of aviation lighting to be installed on the WTGs, as required under CAA. CAP 393, Air Navigation: The Order and the Regulations (2016). The LMP will be prepared in consultation with the CAA, MoD and Maritime and Coastguard Agency (MCA) and will take into account requirements for aviation lighting as specified in Article 223 of the UK ANO 2016 and changes to ICAO Annex 14 Volume 2, Chapter 6, paragraph 6.2.4 promulgated in November 2016.	The production and approval of an LMP will be required under Section 36 Consent and/or Marine Licence conditions.  An outline LMP is provided as part of the offshore application in OP6: Lighting and marking plan. The outline LMP includes details on the aviation lighting and marking requirements.
Charting of installed infrastructure	Tertiary	All permanent structures of more than 91.4 m in height will be charted on aeronautical charts and reported to the Defence Geographic Centre (DGC), which maintains the UK's database of tall structures (Digital Vertical Obstruction File) at least ten weeks prior to construction.	Charting requirements will be secured as a Section 36 Consent and/or Marine Licence condition.  Requirements will be detailed in the LMP and the Development Specification and Layout Plan (DSLPL), required under Section 36 Consent and/or Marine Licence conditions.



MITIGATION MEASURE	FORM (PRIMARY OF TERTIARY)	DESCRIPTION	HOW MITIGATION WILL BE SECURED
			An outline LMP is provided as part of the offshore application in OP6: Lighting and Marking Plan.
<b>NOTAM</b>	Tertiary	Any temporary obstacles associated with wind arms which are of more than 91.4 m in height (e.g. construction infrastructure such as cranes and/or meteorological masts) are to be alerted to aircrews by means of the NOTAM system. Consultation with CAA will be required to ensure that temporary obstacles of more than 91.4 m are identified to aircrews by NOTAM.	Notification of temporary obstacles will be a condition of the Section 36 Consent and/or Marine Licence.
<b>Promulgation of information</b>	Tertiary	CAA will be informed of the locations, heights and lighting status of the WTGs, including estimated and actual dates of construction and the maximum heights of any construction equipment to be used, prior to the start of construction.	Inclusion of locations, heights and lighting status of the WTGs on aviation charts and in the UK IAIP will be a condition of the Section 36 Consent and/or Marine Licence.
<b>Emergency Response Co-operation plan (ERCoP)</b>	Tertiary	An Emergency Response Co-operation Plan (ERCoP) will be in place for the offshore Project. The ERCoP will refer to the marking and lighting of the WTGs and will consider helicopters undertaking SAR operations when rendering assistance to vessels and persons in the vicinity of the OAA. The ERCoP will provide sufficient information about the Project, actions and details required in the event of an emergency situation. This will ensure that MCA recommended standards and procedures are followed as well as ensuring appropriate lighting and marking is in place to facilitate aeronautical safety during SAR helicopter operations.	The production and approval of an ERCoP will be required under Section 36 Consent and/or Marine Licence conditions.
<b>Consultation with Space Hub Sutherland</b>	Tertiary	Continue to consult with Space Hub Sutherland as they develop their launch exclusion zone and operational procedures.	Ongoing commitment for OWPL.



MITIGATION MEASURE	FORM (PRIMARY OF TERTIARY)	DESCRIPTION	HOW MITIGATION WILL BE SECURED
Decommissioning programme	Tertiary	The development of, and adherence to, a Decommissioning Programme, approved by Scottish Ministers prior to construction and updated throughout the Project lifespan.	The production and approval of a Decommissioning Programme will be required under Section 105 of the Energy Act 2004 (as amended).

### 17.5.5 Worst case scenario

As detailed in chapter 7: EIA methodology, this assessment considers the worst case scenario for the offshore Project parameters which are predicted to result in the greatest environmental impact, known as the ‘worst case scenario’. The worst case scenario represents, for any given receptor and potential impact, the design option (or combination of options) that would result in the greatest potential for change.

Given that the worst case scenario is based on the design option (or combination of options) that represents the greatest potential for change, the development of any alternative options within the design parameters will give rise to no worse effects than those assessed in this impact assessment. Table 17-10 presents the worst case scenario for potential impacts on military and aviation during construction, operation and maintenance, and decommissioning.

The potential effects of WTGs on military and aviation are widely publicised but, despite innumerable subtleties in the actual effects, there are two dominant scenarios that lead to potential impacts:

- Physical obstruction: WTGs can present a physical obstruction to aircraft; and
- Impacts on aviation radar systems and the provision of radar-based ATS: WTGs can create unwanted radar clutter which appears on radar displays and can affect the provision of ATS to pilots.

The worst case scenario for military and aviation is therefore based on the maximum number of WTGs, maximum blade tip height and maximum rotor diameter. Table 17-10 presents the worst case scenario for potential impacts on military and aviation during construction, operation and maintenance and decommissioning.



Table 17-10 Worst case scenario specific to military and aviation receptor impact assessment

POTENTIAL IMPACT	WORST CASE SCENARIO	JUSTIFICATION
<b>Construction</b>		
<p><b>Potential impact on military low flying and UK SAR helicopter operations due to presence of obstacles (WTGs in construction).</b></p>	<ul style="list-style-type: none"> <li>• Installation of up to 125 WTGs with maximum tip height up to 359.52 m above Lowest Astronomical Tide (LAT); and</li> <li>• 330 m maximum rotor diameter.</li> </ul>	<p>These parameters represent the maximum design scenario for height of infrastructure and associated installation equipment within the offshore Project, which has the greatest potential for obstruction to air traffic.</p>
<b>Operation and maintenance</b>		
<p><b>Potential impact on military low flying and UK SAR helicopter operations due to presence of obstacles (WTGs).</b></p>	<ul style="list-style-type: none"> <li>• Operation of up to 125 WTGs with maximum tip height up to 359.52 m above LAT; and</li> <li>• 330 m maximum rotor diameter.</li> </ul>	<p>These parameters represent the maximum design scenario for height of infrastructure and associated installation equipment within the offshore Project, which has the greatest potential for obstruction to air traffic.</p>
<b>Decommissioning</b>		
<p><b>Any impacts will be the same, or less, than those identified during the construction stage.</b></p>		



## 17.6 Assessment of potential effects

### 17.6.1 Potential effects during construction (including pre-construction)

#### 17.6.1.1 Potential impact on military low flying and SAR helicopter operations due to presence of obstacles (WTGs in construction)

Pilots are obliged to plan their flying activities in advance and to be familiar with any en-route obstacles they may encounter; however, during flight, weather conditions or operational requirements may necessitate route adjustments. In Visual Meteorological Conditions (VMC) (i.e. good weather conditions), pilots are ultimately responsible for seeing and avoiding obstructions such as WTGs and will be aware of their presence through the notification procedures set out in Table 17-9.

The installation and presence of WTGs pose physical obstructions to aviation operations carried out in the vicinity of windfarms. WTGs can be difficult to see from the air, particularly in poor meteorological conditions, leading to a potential increase in obstacle collision risk. Furthermore, during the construction stage, the presence and movement of installation vessels (with onboard cranes) could also present a potential obstacle collision risk to aircraft operations. However, in the case of the OAA, the cranes used on site during the construction stage will not exceed the height of the WTGs (i.e. 359.52 m above LAT).

In terms of low flying operations, pilots are required to set a Minimum Safe Altitude (MSA) in order to identify the lowest altitude, set in areas, that ensures safe separation between their aircraft and known obstacles. MoD outlined in their scoping response (see Table 17-3) that OWPL was committed to lighting and charting the WTGs and confirmed that, in the interests of air safety, the WTGs should be fitted with MoD accredited aviation safety lighting in accordance with the CAA, ANO 2016; as set out in Table 17-9.

In terms of SAR operations, the MCA will be consulted (post-consent) on the lighting and marking arrangements and on the specific layout of the WTGs with the aim of seeking compatibility with SAR helicopter operations in the event of rescue missions within the OAA. This consultation will continue as WTG layout plans are refined prior to construction (see Table 17-9). The final light and marking arrangements and layouts will be captured in the LMP (see OP6: Outline lighting and marking plan) and the DSLP.

Military low flying and SAR helicopter operations are considered to be high value receptors because all aviation impacts are high value. However, implementation of embedded mitigation measures (as described in Table 17-9) ensures that low flying and SAR helicopter operations will have low vulnerability, since any impacts are unlikely to affect long term functioning of low flying and SAR helicopter operations. Low flying and SAR helicopter operations are therefore deemed to be of **low sensitivity** to the potential risk of collision with obstacles. The impact is predicted to be direct, of local spatial extent, intermittent and low reversibility. The impact, therefore, is considered to be of **low magnitude**.



Evaluation of significance

Taking the low sensitivity and low magnitude of impact, the overall effect is considered to be **negligible** which is **not significant** in EIA terms.

Sensitivity	Magnitude of impact	Consequence
Low	Low	Negligible

Impact significance - NOT SIGNIFICANT

## 17.6.2 Potential effects during operation and maintenance

### 17.6.2.1 Potential impact on military low flying and SAR helicopter operations due to presence of obstacles (WTGs in operation)

The potential impact on military low flying and SAR helicopter operations due to presence of obstacles during the operation and maintenance stage is exactly as detailed in section 17.6.1.1 for the construction stage.

In addition, during maintenance periods, it may be necessary to use surface vessels with crane capabilities for replacement of component parts e.g. WTG blades or the WTGs themselves. These temporary obstacles will be addressed under the NOTAM system set out in section 17.5.4.

Low flying and SAR helicopter operations are considered to be high value receptors because all aviation impacts are high value. However, implementation of embedded mitigation measures (as described in Table 17-9) ensures that low flying and SAR helicopter operations will have low vulnerability, since any impacts are unlikely to affect long term functioning of low flying and SAR helicopter operations. Military low flying and SAR helicopter operations are therefore deemed to be of **low sensitivity** to the potential risk of collision with obstacles. The impact is predicted to be direct, of local spatial extent, intermittent and low reversibility. The impact, therefore, is considered to be of **low magnitude**.

Evaluation of significance

Taking the low sensitivity and low magnitude of impact, overall effect is considered to be **negligible** which is **not significant** in EIA terms.

Sensitivity	Magnitude of impact	Consequence
Low	Low	Negligible

Impact significance - NOT SIGNIFICANT



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### 17.6.3 Potential effects during decommissioning

The preferred decommissioning option will be for as close to full removal as possible, whilst recognising that this will be subject to assessments and consultation closer to the time of decommissioning. It is expected that all above sea surface structures (WTGs and Offshore Substation Platforms (OSPs)) will be removed in full. In the absence of detailed information regarding decommissioning works, the impacts during the decommissioning of the offshore Project are considered analogous with, or likely less than, those of the construction stage.

### 17.6.4 Summary of potential effects

A summary of the outcomes of the assessment of potential effects from the construction, operation and maintenance and decommissioning of the Project is provided in Table 17-11.

No significant effects on military and aviation receptors were identified. Therefore, secondary mitigation measures in addition to the embedded mitigation measures listed in section 17.5.4 are not considered necessary.



Table 17-11 Summary of potential effects

POTENTIAL EFFECT	RECEPTOR	SENSITIVITY OF RECEPTOR	MAGNITUDE OF IMPACT	CONSEQUENCE (SIGNIFICANCE OF EFFECT)	SECONDARY MITIGATION REQUIREMENTS	RESIDUAL CONSEQUENCE (SIGNIFICANT OF EFFECT)
<b>Construction and decommissioning</b>						
<b>Presence of obstacles (WTGs in construction)</b>	Military low flying and SAR helicopter operations	Low	Low	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)
<b>Operation and maintenance</b>						
<b>Presence of obstacles (WTGs in operation)</b>	Military low flying and SAR helicopter operations	Low	Low	Negligible (not significant)	None required above embedded mitigation measures.	Negligible (not significant)



## 17.7 Assessment of cumulative effects

In terms of assessing military and aviation cumulative effects, the impact on any aviation receptor is generally treated as a standalone, Project specific impact. Whilst other WTG developments may be located in close proximity, the impact on each receptor is considered on a case-by-case basis and any significant effect is sufficient to trigger an objection from the relevant aviation stakeholder. However, if one wind farm has an unacceptable effect on an aviation receptor, it will not impact upon any other wind farm. In terms of mitigation, an agreement for one development through consultation with a relevant stakeholder may be of relevance to a neighbouring development, however, it is still necessary for negotiations and discussions with aviation stakeholders on these mitigation measures to be carried out under separate arrangements.

The predicted effects from the offshore Project on military and aviation receptors are considered to be localised to within the footprint of the OAA. Given that the WTGs within the OAA are not considered detectable by any radar system, the offshore Project will not present any cumulative effect on radar systems. Furthermore, given the distance of the OAA from known offshore and onshore developments, the offshore Project is also not considered to present any cumulative effect on military low flying or SAR helicopter operations in the region.

There is no potential for the predicted impacts to interact with impacts from other developments and activities in the military and aviation study area that can lead to a cumulative effect on receptors. Consequently, no further assessment with respect to cumulative effects is required.

## 17.8 Inter-related effects

Inter-related effects are the potential effects of multiple impacts, affecting one receptor or a group of receptors. Inter-related effects include interactions between the impacts of the different stages of the offshore Project (i.e. interaction of impacts across construction, operation and maintenance and decommissioning), as well as the interaction between impacts on a receptor within an offshore Project stage. The potential inter-related effects for military and aviation receptors are described below.

In line with the MS-LOT Scoping Opinion received, this chapter has assessed all impacts that are relevant to military and aviation receptors during construction, operation and maintenance and decommissioning stages of the offshore Project. Therefore, it is considered that the assessment and conclusions presented in section 17.6 provides a complete and robust assessment of all potential impacts relevant to military and aviation receptors. The assessment has also considered the potential for inter-related effects in relation to military and aviation, and no additional inter-related effects beyond those presented in section 17.6 have been identified. There are no interrelated effects within an offshore Project stage as only a single impact has been identified. The presence of obstacles during the construction stage, and subsequently during the operational stage, is not considered to alter the conclusions of the assessment of the impacts alone.

## 17.9 Whole Project assessment

The onshore Project is summarised in chapter 5: Project description and a summary of the effects of the onshore Project is provided in chapter 21: Onshore EIA summary. These onshore aspects of the Project which involve installation of underground cables, and the onshore substation located at or near Spittal as the only above surface



infrastructure, have been considered in relation to the impacts assessed in section 17.6. It is assessed that there is no potential interaction between effects of the offshore Project on receptors described in section 17.6 with any impacts in relation to the onshore Project.

## 17.10 Transboundary effects

Transboundary effects arise when impacts from a development within one European Economic Area (EEA) state's territory affects the environment of another EEA state(s).

There is no potential for transboundary impacts upon military and aviation receptors due to construction, operation and maintenance and decommissioning of the offshore Project. The potential impacts are localised and are not expected to affect other EEA states. Therefore, transboundary effects for military and aviation receptors do not need to be considered further.

## 17.11 Summary of mitigation and monitoring

No secondary mitigation, over and above the embedded mitigation measures proposed in section 17.5.4, is either required or proposed in relation to the potential effects of the offshore Project on military and aviation as no adverse significant impacts are predicted. No military and aviation monitoring to test the predictions made within the assessment of effects is considered necessary.

The location of the pre-assembly port(s) where WTGs, foundations and other infrastructure will be stored, part-assembled prior to being transported to the OAA, is currently undefined. Once confirmed, the locations and transport routes to the OAA will be communicated to HIAL and further consultation will be carried out as to whether there could be any impact to IFPs. Additionally, any temporary obstacles associated with the Project, which are of more than 91.4 m in height will be alerted to aircrews by means of the NOTAM system.



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## 17.13 Abbreviations

ACRONYM	DEFINITION
AD	Air Defence
ADR	Air Defence Radar
agl	above ground level
AIAA	Area of Intense Aerial Activity
ANO	Air Navigation Order 2016
AOC	Aircraft Operator Certificate
ATC	Air Traffic Control
ATS	Air Traffic Services
BOWL	Beatrice Offshore Wind Limited
BT	British Telecommunications
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
DGC	Defence Geographic Centre
DSLIP	Development Specification and Layout Plan
ECC	Export Cable Corridor
EEA	European Economic Area
EIA	Environmental Impact Assessment
ERCoP	Emergency Response Co-operation Plan



ACRONYM	DEFINITION
ES	Environmental Statement
FIR	Flight Information Region
FL	Flight Level
ft	feet
HCA	Helideck Certification Agency
HIAL	Highlands and Islands Airports Limited
HIE	Highlands and Islands Enterprise
HMR	Helicopter Main Route
IAIP	Integrated Aeronautical Information Package
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedures
km	kilometre
LAT	Lowest Astronomical Tide
LFA	Low Flying Area
LMP	Lighting and Marking Plan
LPA	Local Planning Authority
MAA	Military Aviation Authority
MCA	Maritime and Coastguard Agency
MDA	Managed Danger Area



ACRONYM	DEFINITION
MD-LOT	Marine Directorate Licencing Operations Team
MGN	Marine Guidance Note
Mil AIP	Military Aeronautical Information Publication
MoD	Ministry of Defence
MSA	Minimum Safe Altitude
MS-LOT	Marine Scotland Licencing Operations Team
NATS	National Air Traffic Services
NERL	NATS en route ltd
nm	nautical mile
NLB	Northern Lighthouse Board
NOTAM	Notice to Airmen
NtM	Notice to Mariners
OAA	Option Agreement Area
OIC	Orkney Islands Council
OP	Outline Plan
OREI	Offshore Renewable Energy Installations
OSP	Offshore Substation Platform
OWPL	Offshore Wind Power Limited
PEXA	Practice and Exercise Area



ACRONYM	DEFINITION
PFOWF	Pentland Floating Offshore Wind Farm
PSR	Primary Surveillance Radar
RLOS	Radar Line of Sight
SAR	Search and Rescue
SHP	Shapefile
THC	The Highland Council
UK	United Kingdom
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
WTG	Wind Turbine Generator



## 17.14 Glossary

TERM	DEFINITION
<b>Area of Intense Aerial Activity (AIAA)</b>	An airspace within which aircraft, singly or in combination with others, regularly participate in unusual manoeuvres.
<b>Flight Information Region (FIR)</b>	A specified region of airspace in which a flight information service and an alerting service are provided.
<b>Instrument Flight Procedure (IFP)</b>	A published procedure used by aircraft flying in accordance with the instrument flight rules which is designed to achieve and maintain an acceptable level of safety in operations and includes an instrument approach procedure and a standard instrument departure.
<b>Primary Surveillance Radar (PSR)</b>	A radar system that measures the bearing and distance of targets using the detected reflections of radio signals.