Arklow Bank Wind Park 2

Environmental Impact Assessment Report

Volume II, Chapter 16: Civil and Military Aviation

sse Renewables

Version	Date	Status	Author	Reviewed by	Approved by
1.0	09/05/2024	Final (External)	Coleman Aviation	GoBe Consultants	Sure Partners Limited

Statement of Authority

Author Experience

Coleman Aviation Ltd was set up to provide independent consultancy services to the windfarm industry on aviation issues. The company was formed by Wing Commander Mike Coleman (Retd) who retired from the Royal Air Force (RAF) in December 2012 after 27 years' service. His last appointment in the RAF was as Head of the Air Traffic Control (ATC) and Air Defence (AD) operational teams responsible for assessment of windfarm planning applications on behalf of the Ministry of Defence (MoD). In this role, he defined RAF policy for dealing with the operational impact of wind turbines on ATC radars and was pivotal in deciding whether objections against windfarms should be lodged. Throughout his career, he was employed at every level within the ATC specialisation from operational controller through to Head of the RAF ATC Standards organisation; he also served at RAF Lossiemouth for two years as the Senior Air Traffic Control Officer. Prior to converting to ATC, he completed operational tours as a fast-jet navigator compiling nearly 1,000 flying hours on the Tornado GR1.

Since leaving the RAF and establishing Coleman Aviation Ltd, Mike Coleman has worked over ten years for numerous windfarm developers, ranging from individually owned small companies to multi-national energy corporations, in resolving a plethora of windfarm-related aviation issues; these issues include civil airport radar and safeguarding, MoD ATC and AD radar, Low Flying and aviation lighting, search and rescue and emergency helicopter operations and Met Office radar. Mike Coleman has been required to engage with a wide variety of United Kingdom (UK) and Ireland aviation stakeholders including the UK Civil Aviation Authority, the Irish Aviation Authority, Ireland's Department of Defence, UK MoD, National Air Traffic Services and numerous civilian airports.

Most recently, engagements with windfarm developers have ranged from assisting in mitigation negotiations with the UK MoD to resolve ATC radar issues, development of strategies to resolve MoD Air Defence radar issues, provision of aviation specialist input into Environmental Impact Assessment Reports and provision of advice to discharge aviation planning conditions.

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Glossary

Term	Meaning
Above Mean Sea Level	The elevation or altitude (in the air) of an object, relative to the average sea level datum.
Arklow Bank Wind Park 1 (ABWP1)	Arklow Bank Wind Park 1 consists of seven wind turbines, offshore export cable and inter-array cables. Arklow Bank Wind Park 1 has a capacity of 25.2 MW. Arklow Bank Wind Park 1 was constructed in 2003/04 and is owned and operated by Arklow Energy Limited. It remains the first and only operational offshore wind farm in Ireland.
Arklow Bank Wind Park 2 – Offshore Infrastructure	"The Proposed Development", Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements under the existing Maritime Area Consent.
Arklow Bank Wind Park 2 (ABWP2) (the Project)	Arklow Bank Wind Park 2 (ABWP2) (the Project) is the onshore and offshore infrastructure. This EIAR is being prepared for the Offshore Infrastructure. Consent for the Onshore Grid Infrastructure and Operational and Maintenance Facility has been granted in May and June 2022, respectively. • Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements to be consented in accordance with the Maritime Area Consent. This is the subject of this EIAR and will be referred to as 'the Proposed Development' in the EIAR. • Arklow Bank Wind Park 2 Onshore Grid Infrastructure (OGI): This relates to the onshore grid infrastructure for which planning approval has been granted. • Arklow Bank Wind Park 2 Operations and Maintenance Facility (OMF): This includes the onshore and nearshore infrastructure at the OMF, for which planning permission has been granted. • Arklow Bank Wind Park 2 EirGrid Upgrade Works: any non-contestable grid upgrade works, consent to be sought and works to be completed by EirGrid.
Array Area	The Array Area is the area within which the Wind Turbine Generators (WTGs), the Offshore Substation Platforms (OSPs), and associated cables (export, inter- array and interconnector cabling) and foundations will be installed.
Cable Corridor and Working Area	The Cable Corridor and Working Area is the area within which export, inter-array and interconnector cabling will be installed This area will also facilitate vessel jacking operations associated with installation of WTG structures and associated foundations within the Array Area.
Environmental Impact Assessment (EIA)	An Environmental Impact Assessment (EIA) is a statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the Directive 2011/92/EU on the assessment of the effects of certain public and private

Term	Meaning
	projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council (EIA Directive).
EirGrid	State-owned electric power transmission system operator (TSO) in Ireland and Transmission Asset Owner (TAO) for the Project's transmission assets.
Flight Level	A standard nominal altitude of an aircraft, in hundreds of feet, based upon a standardised air pressure at sea level.
Icing Level	The level at which the air contains droplets of supercooled liquid water which results in icing conditions where aircraft lift characteristics can be adversely affected.
Instrument Flight Rules (IFR)	The set of rules that govern aircraft flying in cloud or in low visibility.
Minimum Safe Altitude (MSA)	The lowest altitude which will provide a minimum clearance of 305 m (1,000 ft) above all objects located within a defined sector of airspace.
Mitigation Measure	Measure which would avoid, reduce, or offset an impact.
The Developer	Sure Partners Ltd.
Uncontrolled Airspace	Uncontrolled airspace is airspace of defined dimensions within which pilots are not required to request Air Traffic Control (ATC) services.
Visual Flight Rules (VFR)	The set of rules that govern aircraft flying clear of cloud and in good visibility.

Acronyms

Term	Meaning
ABWP1	Arklow Bank Wind Park 1
ABWP2	Arklow Bank Wind Park 2
amsl	above mean sea level
ASAM	Aeronautical Services Advisory Memorandum
ATC	Air Traffic Control
ATS	Air Traffic Services
CIA	Cumulative Impact Assessment
CIL	Commissioners of Irish Lights
DAA	Dublin Airport Authority
DCCAE	Department of Communications, Climate Action and Environment
DECC	Department of the Environment, Climate and Communications
DHLGH	Department of Housing, Local Government and Heritage
DHPLG	Department of Housing, Planning and Local Government
DoD	Department of Defence
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ERCoP	An Emergency Response and Cooperation Plan
FL	Flight Level
HAT	Highest Astronomical Tide
HWM	High Water Mark
IAA	Irish Aviation Authority

Term	Meaning
IAIP	Integrated Aeronautical Information Package
ICAO	International Civil Aviation Organization
IMC	Instrument Meteorological Conditions
IRCG	Irish Coast Guard
LAT	Lowest Astronomical Tide
LMP	Lighting and Marking Plan
MCA	Maritime and Coastguard Agency
MHW	Mean High Water
MHWS	Mean High Water Springs
MSA	Minimum Safe Altitude
NMPF	National Marine Planning Framework
NOTAM	Notice To Airmen
OGI	Onshore Grid Infrastructure
OMF	Operations and Maintenance Facility
OREDP	Offshore Renewable Energy Development Plan
OSP	Offshore Substation Platform
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations
PSR	Primary Surveillance Radar
RLOS	Radar Line of Sight
SAR	Search and Rescue
SEA	Strategic Environmental Assessment
UK	United Kingdom
VFR	Visual Flight Rules

Term	Meaning
WTG	Wind Turbine Generator

Units

Unit	Description
ft	Feet (measurement; equal to 12 inches)
GW	Gigawatt
km	Kilometre (distance; equal to 1,000 metres)
kV	Kilovolt
nm	Nautical Mile (distance; equal to 1.852 km)

16 Civil and Military Aviation

16.1 Introduction

16.1.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents the assessment of the potential impacts of the Arklow Bank Wind Park 2 (ABWP2) Offshore Infrastructure (hereafter referred to as 'the Proposed Development') on civil and military aviation. Specifically, this chapter considers the potential impact of the Proposed Development below the High Water Mark (HWM) during the construction, operational and maintenance, and decommissioning phases. Only an assessment of effects on the Array Area are considered within this chapter. No impacts pertaining to the Cable Corridor and Working Area are identified and thus are not assessed within this chapter.

16.1.1.2 The primary purpose of the EIAR is outlined in Volume II, Chapter 1: Introduction. It is intended that the EIAR will provide stakeholders with sufficient information to determine the potential significant effects of the Proposed Development on the receiving environment.

16.1.1.3 In particular, this EIAR chapter:

- Presents the existing environmental baseline established from desk studies and consultation;
- Identifies any assumptions and limitations encountered in compiling the environmental information;
- Presents the potential environmental effects on civil and military aviation arising from the Proposed Development, based on the information gathered and the analysis and assessments undertaken; and
- Highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce or offset the possible environmental effects of the Proposed Development on civil and military aviation.

16.2 Regulatory background

16.2.1.1 Planning policy on renewable energy infrastructure is presented in Volume II, Chapter 2: Policy and Legislation. Planning policy, specifically in relation to civil and military aviation, is contained in the National Marine Planning Framework (NMPF) (Department of Housing, Local Government and Heritage (DHLGH), 2021) and the Offshore Renewable Energy Development Plan (OREDP I) (Department of Communications, Climate Action and Environment (DCCAE), 2014 and OREDP II (draft published in 2023). A summary of the policy and legislative provisions relevant to civil and military aviation are provided in Table 16.1.

Table 16.1: Summary of regulatory background

Publisher	Name of document incl. reference	Key provisions
Legislation		
Planning Policy and Development Control		
Department of the Environment, Climate and Communications (DECC), 2022	Strategic Environmental Assessment (SEA) of the OREDP II in Ireland: Environmental Report: https://www.gov.ie/en/publication/71e36-offshore-renewable-energy-development-plan-ii-oredp-ii/#environmental-assessments	Contains the Appropriate Assessment screening process and SEA scoping report of the Maritime area associated with OREDPII. This resource has some important information on existing baseline conditions in the maritime area.
Department of Housing Local Government and Heritage (DHLGH), 2021	National Marine Planning Framework (NMPF): https://assets.gov.ie/139100/f0984c45-5d63-4378-ab65-d7e8c3c34016.pdf	**Defence and Security Policy 1**: Any proposal that has the potential to interfere with the performance by the Defence Forces of their security and non-security related tasks must be subject to consultation with the Defence Organisation (including potential interference with: firing, test or exercise areas and communication, and surveillance systems). Proposals should only be supported where, having consulted with the Defence Organisation, they are satisfied that it will not result in unacceptable interference with the performance by the Defence Forces of their security and non-security related tasks. Potential impacts on Ireland's Defence Organisation are considered in sections 16.5.2.4 and 16.5.2.9.
Department of Communication, Climate Action and Environment (DCCAE), 2014 Department of the Environment, Climate and Communications (DECC), 2023	Offshore Renewable Energy Development Plan I (OREDP I) 2014:	**Aviation Radar:** **Collision:** Ensure wind devices are lit with aviation lights and provide notification of the

Publisher	Name of document incl. reference	Key provisions
	Department of Communications, Energy and Natural Resources - Offshore Renewable Energy Development Plan (assets.gov.ie) Offshore Renewable Energy Development Plan (OREDP II) (draft) 2023: 7338cf63-e174-4932-8c61-6b840e447f3d.pdf (www.gov.ie)	erection of wind devices to the Irish Aviation Authority (IAA). A Lighting and Marking Plan (LMP) is included in Volume II, Appendix 25.6: Lighting and Marking Plan. **Radar Interference:** Consultation with the IAA will be required and the location of wind devices supplied so they can be accurately plotted on the radar and any signals received from that area will not be confused with aeroplanes. Radar interference issues are assessed in sections 16.5.2.4 and 16.9.2. **Military Exercise Areas:** **Disruption to General Activities:** Avoidance of bye-lawed and danger sites. Carry out site selection studies in conjunction with liaison with the Department of Defence and the Ministry of Defence, UK where applicable. Potential impacts on Ireland's Military Exercise Areas are considered in sections 16.5.2.4 and 16.5.2.9.
Environmental Protection Agency (EPA), 2022	Guidelines on the Information to be Contained in EIARs: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf	These Guidelines apply to the preparation of all EIARs undertaken in the State (Ireland)

16.3 Consultation

16.3.1.1 A summary of the key issues raised during consultation activities undertaken to date specific to civil and military aviation is presented in Table 16.2, together with how these issues have been considered in the production of this EIAR chapter.

16.3.1.2 Consultation has been carried out with the relevant aviation stakeholders; namely the IAA, Irish Coast Guard (IRCG), Ireland's Department of Defence (DoD), Commissioners of Irish Lights (CIL), Met Éireann, and Newcastle Aerodrome, the nearest licensed aerodrome to the Proposed Development.

Table 16.2: Summary of consultation relating to civil and military aviation

Date	Consultee and consultation method	Consultation and key issue raised	Section where provision is addressed
March 2019	Newcastle Aerodrome – telecon	Potential impact on Newcastle Aerodrome operations.	The baseline environment for aviation and radar is set out in section 16.5.2. The Proposed Development is located outside the routine operational area of Newcastle Aerodrome; consequently, no adverse impact is expected.
July 2019	IAA – email response	Potential impact on IAA operations; in particular, Air Traffic Control (ATC) radar.	The baseline environment for aviation and radar is set out in section 16.5.2. Potential impacts on ATC radar are assessed in section 16.8..
August 2019	DoD – email response	Potential impact on DoD aviation operations (including ATC radar).	The baseline environment for aviation and radar is set out in section 16.5.2. Potential impacts on DoD operations are assessed in section 16.8. Wind turbines will be marked and lit and observable to night vision equipment.
October/ December 2020	CHC Helicopters – Scoping Response	No adverse impact on SAR anticipated providing the wind turbines are marked on IAA aeronautical charts, however, advised that IRCG should be consulted.	Potential impacts on SAR helicopter operations are assessed in section 16.8. Consultation with IRCG has been carried out by Anatec, authors of Volume II, Chapter 15: Shipping and Navigation who have also produced a LMP to ensure compatibility with potential SAR missions within the windfarm (Volume II, Appendix 25.6: Lighting and Marking Plan).
October 2020	Met Éireann – Scoping Response	Potential impact on existing Met Éireann weather radars located at Dublin Airport and Shannon Airport, and future weather radar.	The baseline environment for aviation and radar (including weather radar) is set out in section 16.5.2. Potential impacts on weather radar are considered in section 16.6.2.

Date	Consultee and consultation method	Consultation and key issue raised	Section where provision is addressed
November 2020	DoD (Air Corps) – Scoping Response	Feedback from Air Corps following consultation with Casement Aerodrome: Advised that all turbines should be illuminated by high intensity obstacle lights. Advised that obstruction lights should be incandescent or of a type visible to night vision equipment.	Potential impacts on DoD Air Corps operations are considered in section 16.8. Factored-in measures, including lighting and marking and Notices to Mariners, are detailed in section 16.7.3. Potential impacts on DoD Naval Service operations are addressed in Volume II, Chapter 15: Shipping and Navigation.
February 2021	CIL – Meeting	Discussion on CIL turbine lighting and marking requirements.	CIL to be updated as emergency response plans are developed (see section 16.7.3). Consultation with CIL has been carried out. A LMP is included in Volume II, Appendix 25.6: Lighting and Marking Plan.
February 2021	IRCG – Meeting	Discussion on IRCG requirements for turbine layout design and SAR lighting and marking.	Potential impacts on SAR helicopter operations are assessed in section 16.8. Consultation with IRCG has been carried out by Anatec, author of Volume II, Chapter 15: Shipping and Navigation who have also drafted a LMP to ensure compatibility with potential SAR missions within the windfarm (Volume II, Appendix 25.6: Lighting and Marking Plan).
February 2021	IAA (now known as AirNav (Ireland)) – Scoping Response	Confirmed no concerns from the Systems (Communication, Navigation and Surveillance) perspective. Confirmed no concerns in relation to impact on flight procedures for Dublin Airport, providing the wind turbines do not exceed 1,000 feet (ft) above mean sea level (amsl). Provided information relating to the notification process in advance of installation of obstacles and associated cranes, to ensure new obstacles can be promulgated.	The baseline environment for aviation and radar is set out in sections 16.5.2 and 16.8. Potential impacts on ATC radar are assessed in section 16.8. Wind Turbine Generator (WTG) tip heights associated with both design options are 273 and 287m above LAT respectively which is less than 1,000 ft above amsl (equivalent to c. 306m above LAT).
April 2023	IAA – Pre-scoping email	Advised IAA that maximum tip heights had increased and that a revised Scoping Report would be submitted later in 2023.	No response received. The baseline environment for aviation and radar is set out in section 16.5.2. Potential impacts on ATC radar are assessed in section 16.8.
April 2023	DoD – Pre-scoping email	Advised DoD that maximum tip heights had increased and that a revised Scoping Report would be submitted later in 2023.	No response received. The baseline environment for aviation and radar is set out in section 16.5.2. Potential impacts on DoD operations are assessed in section 16.8.
August 2023	Met Éireann – Scoping Response	Advised that Met Éireann have previously provided input to the Draft Revised Wind Energy Development	The baseline environment for aviation and radar (including weather radar) is set out in section 16.5.2.

Date	Consultee and consultation method	Consultation and key issue raised	Section where provision is addressed
		Guidelines 2019. This should be referenced in the EIAR and appropriate assessments be carried out to ensure compliance with the relevant guidelines.	Potential impacts on weather radar are considered in section 16.8.
August 2023	IAA – Scoping Response	Recommendation to engage with Dublin Airport Authority (DAA), IRCG, DoD and AirNav (Ireland). In the event of planning consent being granted, the following planning conditions should be imposed: Agree an aeronautical obstacle warning light scheme for the windfarm development; Provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location; and Notify the IAA of intention to commence crane operations with at least 30 days prior notification of their erection.	Consultation has taken place with IRCG, DoD and AirNav (Ireland) as discussed in this table. The Developer has also engaged with DAA, as discussed in this table, but their response is awaited. The Developer is agreeable to the recommended planning conditions being imposed in line with the factored-in measures discussed in section 16.7.3.
October 2023	IAA – Scoping Report email	Follow-up email to IAA requesting confirmation that the Proposed Development will not create adverse impact on ATC and radar operations in line with IAA's consultation response of February 2021.	Awaiting response. The baseline environment for aviation and radar is set out in section 16.5.2. Potential impacts on ATC radar are assessed in section 16.8.
October 2023	DoD – Scoping Report email	Advised DoD that 2023 Scoping Report had been submitted in July 2023 and that DoD response requested.	Awaiting response. The baseline environment for aviation and radar is set out in section 16.5.2. Potential impacts on DoD operations are assessed in section 16.8.
October 2023	DAA – Scoping Report email	Advised DAA that 2023 Scoping Report had been submitted in July 2023 and that DAA response requested.	Awaiting response. The baseline environment for aviation and radar is set out in section 16.5.2. Potential impacts on DAA operations are assessed in section 16.8.
February 2024	Newcastle Aerodrome – telecon	Confirmation of no impact on Newcastle Aerodrome operations.	The baseline environment for aviation and radar is set out in section 16.5.2. The aerodrome owner confirmed that the Proposed Development is not expected to impact Newcastle Aerodrome operations.

16.4 Study area

16.4.1.1 The Civil and Military Aviation Study Area is determined by the range of the aviation receptors that could potentially be affected; in particular, ATC radar systems. The Civil and Military Aviation Study Area covers radars on the east coast of Ireland that could potentially detect the wind turbines within the Array Area; with the extent of the Civil and Military Aviation Study Area defined

by the furthest potential aviation receptor, Dublin Airport's Primary Surveillance Radar (PSR). The Civil and Military Aviation Study Area also covers airspace designations including military practice areas that intersect or are adjacent to the Array Area and Cable Corridor and Working Area and designated air routes which may cross the Array Area; and within 9 nautical miles (nm) of the Array Area (based on potential for helicopter access to any surface infrastructure). Figure 16.1 displays all aeronautical information within the bounds of the figure, however only airspace designations relevant to the Proposed Development are labelled.

16.4.1.2 The Cumulative Civil and Military Aviation Study Area includes the area within 50 kilometres (km) from the boundary of the Proposed Development.

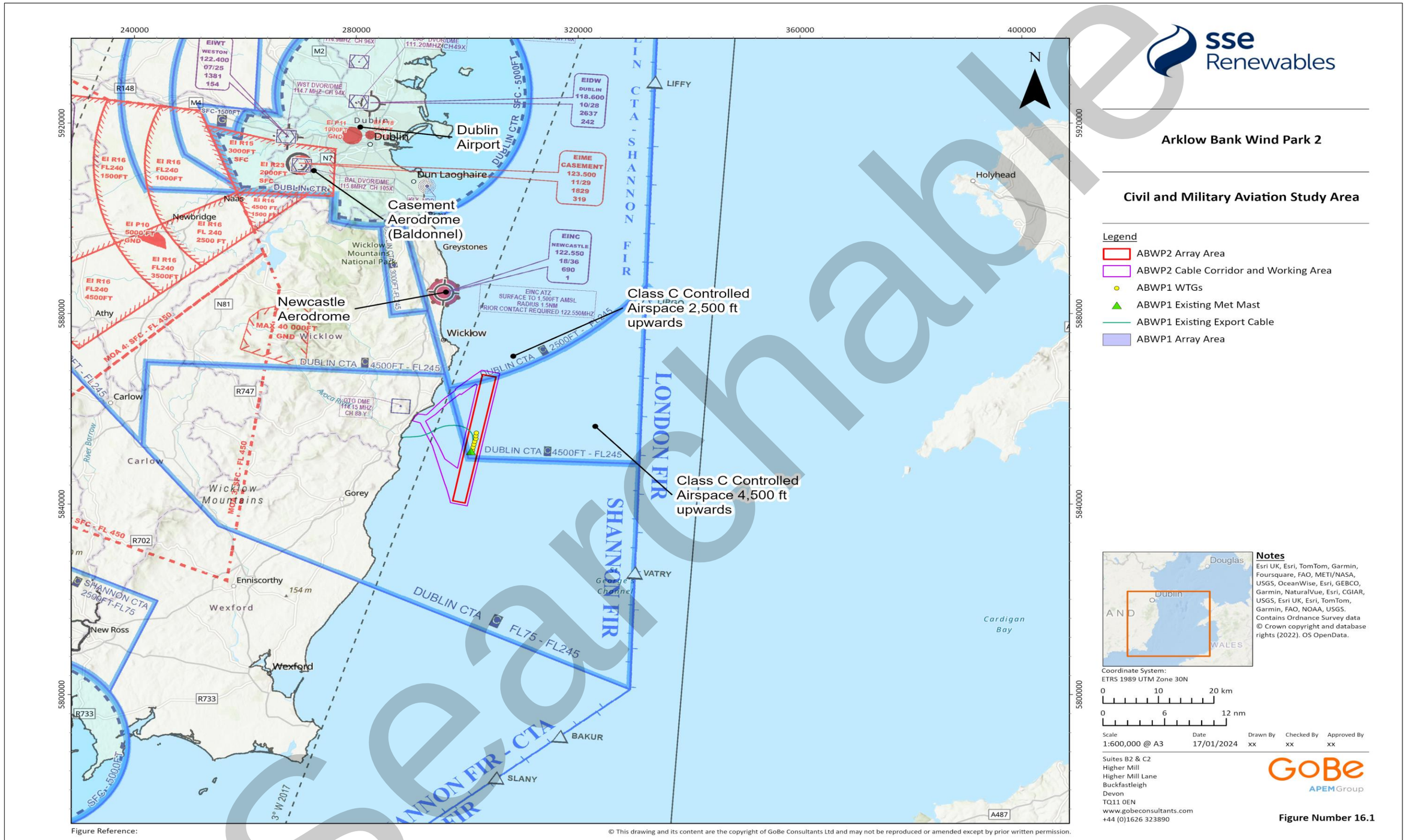

Figure 16.1: Civil and Military Aviation Study Area and aviation receptor locations

16.5 Methodology

16.5.1 Methodology to inform the baseline

Desktop studies

16.5.1.1 Information on civil and military aviation within the Civil and Military Aviation Study Area has been collected through a detailed desktop review of existing studies and datasets. These are summarised at Table 16.3.

16.5.1.2 The desktop review was conducted using comprehensive aviation documentation and charts to identify potential aviation receptors during the construction, operational and maintenance, and decommissioning phases of the Proposed Development. Supporting information was also drawn from a review of data sources; in particular, the Ireland Integrated Aeronautical Information Package (IAIP).

Table 16.3: Summary of key desktop reports and data resources

Title	Source	Year	Author
ABWP2 Environmental Impact Assessment (EIA) Scoping Report 2023	Sure Partners Ltd	2023	Sure Partners Ltd
Obstacles to Aircraft in Flight - Order S.I. 215	IAA	2005	IAA
IAA Visual Flight Rules (VFR) Aviation Chart 1:500,000	IAA	2023	IAA
Ireland IAIP	IAA	2023	IAA

Site specific surveys

16.5.1.3 No site-specific surveys have been undertaken to inform the EIAR for civil and military aviation. The baseline characterisation developed through existing data sources and consultation is considered sufficient to inform this chapter, based on expert judgement.

16.5.1.4 The desktop review was undertaken to characterise the existing baseline conditions within the Civil and Military Aviation Study Area. In terms of aviation, the baseline environment is influenced by the airspace, within which it is important to identify the locations of relevant radar receptors, such as ATC radar systems, as well as any potential aviation stakeholders. Consequently, the Civil and Military Aviation Study Area encompasses both the Array Area and the Cable Corridor and Working Area.

16.5.2 Baseline environment

16.5.2.1 It should be noted that the current baseline environment includes the existing seven Arklow Bank Wind Park 1 (ABWP1) Wind Turbines (WTGs). A summary of the current baseline environment for civil and military aviation is presented below.

Airspace structure

16.5.2.2 The Proposed Development is situated in an area of Class G uncontrolled airspace which is established from the surface up to 2,500 ft amsl in the far northern portion of the Array Area; and up to 4,500 ft amsl and Flight Level (FL) 75 (7,500 ft) in the remaining portion of the Array Area.

Above these altitudes, Class C controlled airspace is established up to FL 245 (24,500 ft). Within these classifications of airspace, the following rules apply:

- Class G Airspace: aircraft can operate in this area of uncontrolled airspace without any mandatory requirement to be in communication with, or receive a radar service from, an ATC unit. Pilots of aircraft operate under VFR in Class G airspace and are ultimately responsible for seeing and avoiding other aircraft and obstacles; and
- Class C Airspace: aircraft operating within Class C controlled airspace must be in receipt of an Air Traffic Service (ATS) from an appropriate ATC unit.

16.5.2.3 The aviation operations potentially affected by the Proposed Development have been identified as follows:

Military aviation

16.5.2.4 Ireland's DoD has its primary airbase at Casement Aerodrome which is located approximately 30 nm northwest of the Array Area; this is home to the DoD's Air Corps. The Air Corps operate a fleet of fixed and rotary wing aircraft providing military support to the Army and Naval services, together with non-military tasks such as Garda air support, air ambulance, fisheries protection and the Ministerial Air Transport Service. The Air Corps also provide ATC services to military aircraft using a radar data feed from the Dublin Airport PSR.

Civil aviation

16.5.2.5 The IAA operates a PSR at Dublin Airport approximately 33 nm northwest of the Array Area. Although the Proposed Development is outside the airport's statutory safeguarding area, it is technically within the operating range of the PSR.

Aerodromes

16.5.2.6 Newcastle Aerodrome is located approximately 10 nm northwest of the Array Area and is the nearest licensed aerodrome to the Proposed Development, but it is important to note that the aerodrome is not radar equipped. Although technically outside the recommended 5 km consultation zone, the owner of the aerodrome was consulted and confirmed that the Proposed Development will not impact on Newcastle Aerodrome's operations; see Table 16.2. The Brittas Bay Aerodrome, located approximately 6 nm west of the Array Area, is disused and there are no plans for it to be re-established.

SAR

16.5.2.7 The IRCG operate five SAR helicopters deployed at bases in Dublin, Waterford, Shannon and Sligo, which respond to emergencies at sea, inland waterways, offshore islands and the mountains of Ireland (Department of Transport, 2019). Consultation has also been carried out with IRCG on their requirements in relation to turbine layout design and SAR lighting and marking.

Helicopter routes

16.5.2.8 There is no surface infrastructure, such as oil and gas platforms, requiring helicopter access within 9 nm of the Array Area.

Military exercise and training areas

16.5.2.9 There are no military exercise and training areas in the vicinity of the Array Area.

Meteorological radar

16.5.2.10 Met Éireann operates meteorological radars at Dublin and Shannon airports. These radars provide data that is critical for weather sensing, monitoring and forecasting and which enables

timely weather warnings to be provided. The nearest meteorological radar is located 30.6 nm (56.7 km) to the northwest of the Array Area at Dublin Airport.

16.5.3 'Do nothing' scenario

16.5.3.1 Annex IV of the EIA Directive sets out the information required to be included in an EIAR. This includes "a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge". In the event that the Proposed Development does not proceed, an assessment of the future baseline conditions has been carried out and is described within this section.

16.5.3.2 The national aviation policy was launched in 2015 with goals to enhance Ireland's connectivity by ensuring safe, secure and competitive access responsive to the needs of business, tourism and consumers; foster the growth of aviation enterprise in Ireland to support job creation and position Ireland as a recognised global leader in aviation; and maximise the contribution of the aviation sector to Ireland's economic growth and development. In line with this policy plans for airport expansion have progressed including establishment of a new runway at Dublin Airport which opened for operations on 24 August 2022. This new runway is set to increase capacity by 10 million passengers and the number of commercial flights using the airport.

16.5.3.3 There is potential for significant growth in offshore wind energy, with the Irish Government setting out plans for 5 gigawatts (GW) of offshore wind by 2030; therefore, there is potential for an increase in helicopter service provision in the Irish Sea to support future offshore energy developments. However, new marine technology using marine service and accommodation vessels equipped with walk-to-work systems is offering an alternative to helicopters for the wind energy which may reduce the potential for any future helicopter activity in this area.

16.5.4 Data limitations

16.5.4.1 The data used in this chapter are detailed in section 16.5.1. 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 section 16.3. It is considered that the data employed in the assessment are robust and sufficient for the purposes of the impact assessment presented.

16.6 Impact assessment methodology

16.6.1 Key parameters for assessment

16.6.1.1 The assessment of significance of effects has been carried out on both of the two discrete Project Design Options detailed in Volume II, Chapter 4, Description of Development. This approach has allowed for a robust and full assessment of the Proposed Development.

16.6.1.2 The two Project Design Options and parameters relevant to each potential impact are detailed in Table 16.4 and Table 16.5.

Table 16.4: Project design parameters and impacts assessed – Project Design Option 1

Potential impact	Phase			Project Design Option 1
	C	O	D	
Creation of physical obstacles affecting air traffic	✓	✓	✓	***Construction phase*** • Installation of 56 wind turbines within the Array Area with tip height of 273 m above Lowest Astronomical Tide (LAT) with construction equipment (such as cranes) up to a maximum height of 220 m above Highest Astronomical Tide (HAT); • Offshore construction may take place over a period of up to five years. ***Operational and maintenance phase*** • Presence of 56 wind turbines within the Array Area with tip height of 273 m above LAT, with maintenance equipment (such as cranes) of 220 m above HAT; • Operational phase up to 36.5 years. ***Decommissioning phase*** • As above for the construction phase.
Interference with civil and military PSR systems	✗	✓	✗	***Operational and maintenance phase*** • Presence of 56 wind turbines within the Array Area with tip height of 273 m above LAT, with maintenance equipment (such as cranes) of 220 m above HAT; • Operational phase up to 36.5 years.

Table 16.5: Project design parameters and impacts assessed - Project Design Option 2

Potential impact	Phase			Project Design Option 2
	C	O	D	
Creation of physical obstacles affecting air traffic	✓	✓	✓	***Construction phase*** • Installation of 47 wind turbines within the Array Area with tip height of 287 m above LAT with construction equipment (such as cranes) height of 220 m above HAT; • Offshore construction may take place over a period of up to five years. ***Operational and maintenance phase*** • Presence of 47 wind turbines within the Array Area with tip height of 287 m above LAT, with maintenance equipment (such as cranes) of 220 m above HAT; • Operational phase up to 36.5 years. ***Decommissioning phase*** • As above for the construction phase.
Interference with civil and military PSR systems	×	✓	×	***Operational and maintenance phase*** • Presence of 47 wind turbines within the Array Area with tip height of 287 m above LAT, with maintenance equipment (such as cranes) up to a maximum height of 220 m above HAT; • Operational phase up to 36.5 years.

16.6.2 Impacts scoped out of the assessment

16.6.2.1 On the basis of the baseline environment and the description of development outlined in Volume II, Chapter 4: Description of Development, a number of impacts are proposed to be scoped out of the assessment for civil and military aviation. These impacts are outlined, together with a justification for scoping them out, in Table 16.6.

Table 16.6: Impacts scoped out of the assessment for civil and military aviation

Potential impact	Justification
Impact of wind turbines on civil aerodrome procedures	The operator of Newcastle Aerodrome has confirmed that the Proposed Development will not adversely impact on their operations (see Table 16.2); Brittas Bay Aerodrome (5 nm north of Arklow town) is disused with no plans to become re-established (see section 16.5.2).
Impact of helicopter operations associated with the Proposed Development on available air space for other users	Helicopters may be used during the construction, operational and maintenance and decommissioning phases of the Proposed Development. There may be up to three helicopters on site at one time during the construction period, with 294 return trips across the construction period (118 return trips per year). During the Operational and Maintenance phase there will be a maximum of two helicopters on site at any one time and a total of 485 return trips per year. As no regular users of the airspace over the Array Area have been identified, this impact has been scoped out of further assessment.
Impact of wind turbines on meteorological radar	The presence of wind turbines can create challenges to meteorological radars due to the rotating blades. Impacts to meteorological radar can occur in several ways ranging from contamination of the quality of the radar data to loss of meteorological data altogether. More specifically, the presence of wind turbines in Radar Line of Sight (RLOS) can create significant types of interference to weather radar data; namely, blockage, reflectivity, multi-path scattering and clutter. However, wind turbines 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 30.6 nm (56.7 km) to the northwest of the Array Area at Dublin Airport, it is not possible for the Proposed Development to have any adverse impact on any meteorological radars.

16.7 Methodology for assessing the significance of effects

16.7.1 Overview

16.7.1.1 The civil and military aviation impact assessment has followed the methodology set out in Volume II, Chapter 5: EIA Methodology. Specific to the civil and military aviation impact assessment, the following guidance documents have also been considered:

- IAA (En-Route Obstacles to Air Navigation) Order 1999;
- IAA (Guidance Material for Obstruction Surveys) ASAM No: 023, Issue 2 2015;
- IAA (Guidance Material on Off-Shore Windfarms) ASAM No: 018, Issue 2 2015;
- IAA (Obstacles to Aircraft in Flight) Order 2005;
- Ireland IAIP; and
- IAA VFR Aviation Chart 1:500,000.

16.7.1.2 In addition, the civil and military aviation impact assessment has considered the legislative framework as defined by:

- International Civil Aviation Organization (ICAO) Annex 14 - Aerodromes;
- Doc 8168 – ICAO Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS);
- European Union COMMISSION REGULATION No 73/2010 of 26 January 2010 laying down requirements on the quality of aeronautical data and aeronautical information for the single European sky; and
- EU REGULATION 923 - Standardized European Rules of the Air.

16.7.2 Impact assessment criteria

16.7.2.1 The criteria for determining the significance of effects is a two-stage process that involves defining the sensitivity of the impacts and the magnitude of the receptors. This section describes the criteria applied in this chapter to assign values to the sensitivity of potential impacts and the magnitude of the receptors. The terms used to define magnitude and sensitivity are based on those which are described in further detail in Volume II, Chapter 5: EIA Methodology.

SENSITIVITY

Table 16.7: Definitions of sensitivity of the receptor

Receptor 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 Proposed Development 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 Proposed Development 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 Proposed Development 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 Proposed Development and/or has high recoverability.

MAGNITUDE

Table 16.8: Definition of terms relating to the magnitude of an impact

Magnitude	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 Proposed Development and/or frequency of repetition is continuous and/or effect is not reversible for Proposed Development).

Magnitude	Definition
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 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 (i.e. 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 (i.e. in place prior to commencement of construction period) and/or frequency of repetition is negligible to continuous and/or effect is reversible.

SIGNIFICANCE OF EFFECT

16.7.2.2 The significance of the effect upon civil and military aviation is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The particular method employed for this assessment is presented in Table 16.9. Where a range of significance of effect is presented in Table 16.9, the final assessment for each effect is based upon expert judgement.

16.7.2.3 For the purposes of this assessment, any effects with a significance level of slight or less have been concluded to be not significant in EIA terms.

Table 16.9: Significance of effect matrix

			Baseline Environment - Sensitivity			
			High	Medium	Low	Negligible
Description of Impact - Magnitude	Adverse Impact	High	Very Significant (significant)	Significant	Moderate*	Imperceptible
		Medium	Significant	Moderate*	Slight	Imperceptible
		Low	Moderate*	Slight	Slight	Imperceptible
	Neutral Impact	Negligible	Not Significant	Not Significant	Not Significant	Imperceptible
	Positive Impact	Low	Moderate*	Slight	Slight	Imperceptible
		Medium	Significant	Moderate*	Slight	Imperceptible
		High	Profound or Very Significant (significant)	Significant	Moderate*	Imperceptible

*Moderate levels of effect have the potential, subject to the assessor's professional judgement to be significant or not significant. Moderate will be considered as significant or not significant in EIA terms, depending on the sensitivity and magnitude of change factors evaluated. These evaluations are explained as part of the assessment, where they occur.

16.7.3 Factored in measures

16.7.3.1 The Project Design Options set out in Volume II, Chapter 4: Description of Development include a number of designed-in measures and management measures (or controls) which have been factored into the Proposed Development and are committed to be delivered by the Developer as part of the Proposed Development.

16.7.3.2 These factored-in measures are standard measures applied to offshore wind development, including lighting and marking of the Proposed Development, use of 'soft-starts' for piling operations etc, to reduce the potential for impacts. Factored-in measures relevant to the assessment on civil and military aviation are presented in Table 16.10. These measures are integrated into the description of development and have therefore been considered in the impact assessment (i.e. the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type of development. This approach is in line with EPA guidance which states that 'in an EIAR it may be useful to describe avoidance measures that have been integrated into the proposed proposal' (EPA, 2022).

Table 16.10: Factored in measures

Factored in measures	Justification
Preparation and implementation of a LMP setting out specific requirements in terms of aviation lighting to be installed on the turbines. The LMP will be further developed in consultation with the IAA, DoD and IRCG. It has taken into account DoD's request that the wind turbines are observable to night vision equipment. An LMP Plan is included in Volume II, Appendix 25.6: Lighting and Marking Plan.	To ensure appropriate lighting is in place to facilitate aeronautical safety.
IAA and IRCG have been consulted on the layouts of the Proposed Development to ensure compatibility with SAR helicopter operations in the event of rescue missions within the windfarm.	To ensure compatibility between marine navigation and SAR helicopter operations in terms of lighting requirements.
A minimum spacing of 500 m shall be maintained between blade tip to blade tip of all surface infrastructure (for OSPs, this shall be taken as the outermost point of the infrastructure).	To facilitate access by SAR helicopters operating under Instrument Meteorological Conditions (IMC) flight rules, in line with UK guidance (Maritime and Coastguard Agency (MCA), 2021, Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for Search and Rescue and Emergency Response).
An Emergency Response and Cooperation Plan (ERCoP) will be in place for the Proposed Development. The ERCoP will refer to the marking and lighting of the wind turbines and will consider helicopters undertaking SAR operations when rendering assistance to vessels and persons in the vicinity of the Proposed Development. An ERCoP is included in Volume II, Appendix 25.5: Emergency Response Cooperation Plan.	To ensure appropriate lighting is in place to facilitate aeronautical safety during SAR operations.
The IAA will be informed of the locations, heights and lighting status of the wind turbines, including estimated and actual dates of construction and the maximum heights of any construction equipment to be used, prior to the start of construction, to allow inclusion on aviation charts and in the IAA IAIP.	To comply with OREDP I (DCCAE, 2014) which requires the IAA to be notified of the construction and location of wind turbines.
All structures > 90 m amsl in height will be charted on aeronautical charts and reported to the IAA at least three months prior to construction, for input into the IAA's database of tall structures in Ireland.	An obstacle which is higher than 90 m in height is considered to have significance for the en-route operations of aircraft in Irish airspace.
During the operational phase, the operator of the Proposed Development will issue, as necessary, requests to the IAA to submit Aeronautical Information Circulars in the event of any failure of aviation lighting. Any light which fails shall be repaired or replaced as soon as is reasonably practicable. An alerting system for light failure will be put in place, such as remote monitoring or other suitable method agreeable to the IAA.	To comply with IAA Aeronautical Services Advisory Memorandum (ASAM) No.18 (IAA, 2015a) which contains the policy on actions in the event of the failure of aviation warning lights on offshore wind turbines listed in the IAA IAIP.

16.8 Assessment of the significance of effects

16.8.1.1 The impacts of the construction, operational and maintenance and decommissioning phases of both Project Design Options forming the Proposed Development have been assessed on civil and military aviation. The potential impacts arising from the construction, operational and maintenance and decommissioning phases of the Proposed Development are listed in Table 16.4 and Table 16.5, along with the project parameters against which each impact has been assessed.

16.8.1.2 A description of the potential effect on civil and military aviation receptors caused by each identified impact is provided in Section 16.9.

16.9 Assessment of Project Design Option 1 and 2

16.9.1 Impact 1 – Creation of physical obstacles affecting air traffic

16.9.1.1 The installation and presence of the 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.

SENSITIVITY OF THE RECEPTOR

16.9.1.2 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. Under VFR conditions, pilots are ultimately responsible for seeing and avoiding obstructions such as wind turbines and will be aware of their presence through the notification procedures set out in Table 16.10.

16.9.1.3 In terms of potential impact on DoD aviation operations, DoD confirmed that the Proposed Development would have no significant impact on Air Corps operations, provided the turbines are marked and lit and observable to night vision equipment (see section 16.3).

16.9.1.4 In terms of SAR operations, consultation has also been carried out with IRCG on their requirements in relation to turbine layout design and SAR lighting and marking and consultation will continue prior to construction.

16.9.1.5 All aviation operations are deemed to be of high vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore, considered to be High.

Construction phase

16.9.1.6 During the construction phase, the presence and movement of installation vessels (with onboard cranes) may also present a potential obstacle collision risk to aircraft operations; the cranes used during the construction phase will have a maximum operating height of 220 m above HAT.

MAGNITUDE OF THE IMPACT

16.9.1.7 Although Project Design Option 1 has 56 proposed WTGs and Project Design Option 2 has 47 proposed WTGs, the critical parameter relevant to creating obstacles to aircraft is the height of the affecting WTGs. The maximum height of Project Design Option 1 WTGs is 273 m (896 ft) (above LAT) and the maximum height of Project Design Option 2 WTGs is 287 m (942 ft) (above LAT); both Project Design Options are assessed in this section.

16.9.1.8 The presence of construction infrastructure, such as installation vessels with 220 m high cranes, will be alerted to pilots under the Notice to Airmen (NOTAM) system (see Table 16.10). The

NOTAM will provide details of potential hazards along a flight route, or at a location, that could affect the safety of flight. The cranes will also have appropriate aviation lighting installed.

16.9.1.9 In terms of the wind turbines themselves, aircraft operating at low levels are required to set a Minimum Safe Altitude (MSA); this is the lowest altitude set in areas to ensure safe separation between aircraft and known obstacles. The MSA for aircraft operating in Instrument Meteorological Conditions (IMC) (i.e. poor weather conditions), enables aircraft to maintain a minimum of 1,000 ft (305 m) clearance between aircraft and known obstacles. Project Design Options 1 and 2 will affect MSA as follows:

16.9.1.10 **Project Design Option 1:** The tip height of Project Design Option 1 WTGs is 273 m (896 ft) (above LAT). Therefore, the MSA in the area of Arklow Bank will need to be 1,900 ft (896 ft + 1,000 ft rounded to the next 100 ft) in order to maintain at least 1,000 ft vertical separation between the wind turbines and aircraft.

16.9.1.11 **Project Design Option 2:** The tip height of Project Design Option 2 WTGs is 287 m (942 ft) (above LAT). Therefore, the MSA in the area of Arklow Bank will need to be 2,000 ft (942 ft + 1,000 ft rounded to the next 100 ft) in order to maintain at least 1,000 ft vertical separation between the wind turbines and aircraft.

16.9.1.12 **Both Project Design Options:** As detailed in Table 16.10, potential impacts to low flying aircraft operating in the vicinity of the Proposed Development will be managed through the agreement of a LMP (see Volume II, Appendix 25.6: Lighting and Marking Plan) with key aviation stakeholders, and notification of the locations, heights and lighting status of the wind turbines to aviation stakeholders for inclusion in appropriate aviation documentation and charts. This will enable aviation operators to set an appropriate MSA over the Proposed Development. The LMP will also cover the lighting and marking details for the construction infrastructure (e.g. cranes).

16.9.1.13 The impact is predicted to be of local spatial extent, short-term duration, without repetition and, if required, reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **Negligible** for both Project Design Options.

SIGNIFICANCE OF THE EFFECT

16.9.1.14 Following implementation of factored-in measures outlined in Table 16.10, which will need to be in place prior to commencement of the construction period, the magnitude of the impact has been assessed as **Negligible**, with the sensitivity of the receptor being **High**. Therefore, the significance of effect of creating physical obstacles to air traffic as a result of installation of the proposed wind turbines is **Not Significant**, which is **not significant** in EIA terms (for both Project Design Options).

PROPOSED MITIGATION

16.9.1.15 No mitigation is required above the factored in measures listed in Table 16.10**.**

RESIDUAL EFFECT ASSESSMENT

16.9.1.16 The significance of effect of creating physical obstacles to air traffic as a result of installation of the proposed wind turbines is **Not Significant** in EIA terms for both Project Design Options. Therefore, no additional mitigation to that already identified in Table 16.10 are considered necessary. Consequently, **no significant adverse** residual effects have been predicted in respect of civil and military aviation for both Project Design Options.

Operational and maintenance phase

MAGNITUDE OF IMPACT

16.9.1.17 As discussed in paragraph 16.9.1.9, aircraft operating at low levels are required to set an MSA; the impact of Project Design Options 1 and 2 are as outlined in paragraphs 16.9.1.10 and 16.9.1.11.

16.9.1.18 As detailed in Table 16.10, potential impacts to low flying aircraft operating in the vicinity of the Proposed Development will be managed through the agreement of a LMP (see Volume II, Appendix 25.6: Lighting and Marking Plan) with key aviation stakeholders, and notification of the locations, heights and lighting status of the wind turbines to aviation stakeholders for inclusion in appropriate aviation documentation and charts. This will enable aviation operators to set an appropriate MSA over the Proposed Development.

16.9.1.19 During maintenance periods, it may be necessary to use surface vessels with crane capabilities for replacement of component parts e.g. wind turbine blades. These temporary obstacles will be addressed under the NOTAM system as discussed in Table 16.10.

16.9.1.20 The impact is predicted to be of local spatial extent, short-term duration, without repetition and, if required, reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be **Negligible** for both Project Design Options.

SIGNIFICANCE OF EFFECT

16.9.1.21 Following implementation of factored-in measures outlined in Table 16.10, which will need to be in place prior to commencement of the construction period, the magnitude of the impact has been assessed as **Negligible**, with the sensitivity of the receptor being **High**. Therefore, the significance of effect of creating physical obstacles to air traffic as a result of installation of the proposed wind turbines is **Not Significant**, which is **not significant** in EIA terms (for both Project Design Options).

PROPOSED MITIGATION

16.9.1.22 No mitigation is required above the factored in measures listed in Table 16.10.

RESIDUAL EFFECT ASSESSMENT

16.9.1.23 The significance of effect of creating physical obstacles to air traffic as a result of operating the proposed wind turbines is **Not Significant** in EIA terms for both Project Design Options. Consequently, no significant adverse residual effects have been predicted in respect of civil and military aviation for both Project Design Options.

Decommissioning phase

16.9.1.24 The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The significance of effect is therefore **Not Significant** for both Project Design Options, which is **not significant** in EIA terms.

16.9.2 Impact 2 – Interference with civil and military PSR systems

16.9.2.1 WTGs have been shown to have detrimental effects on the performance of PSR systems and have the potential to affect the provision of radar based ATS. These effects include the desensitisation of radar in the vicinity of wind turbines, shadowing and the creation of unwanted returns which air traffic controllers must treat as aircraft returns. Unwanted radar clutter can affect

the provision of ATS to pilots. Radar clutter (or false radar returns) can confuse air traffic controllers making it difficult to differentiate between aircraft and those radar returns resulting from the detection of wind turbines. Furthermore, the appearance of multiple false targets in close proximity can generate false aircraft tracks and seduce those returns from real aircraft away from the true aircraft position.

16.9.2.2 It should be noted that adverse effect on PSRs is only possible if the WTG blades are moving, therefore this impact is applicable to the operational and maintenance phase only.

SENSITIVITY OF THE RECEPTOR

16.9.2.3 Desensitisation of the radar could result in aircraft not being detected by the radar and therefore not presented to air traffic controllers. Controllers use the radar to separate and sequence aircraft; therefore, maintaining situational awareness of all aircraft movements within the airspace is crucial to achieving a safe and efficient ATS, and the integrity of radar data is central to this process. The creation of unwanted returns displayed on the radar leads to increased workload for both controllers and aircrews. Furthermore, real aircraft returns can be obscured by a turbine's radar return, making the tracking of both conflicting unknown aircraft and the controllers' own traffic much more difficult.

16.9.2.4 Consultation with the IAA has indicated that adverse impacts on PSR systems are not anticipated, and that there will not be an impact on Dublin Airport operations.

16.9.2.5 Impact on civil and military PSR systems are deemed to be of high vulnerability, high recoverability and high value. The sensitivity of the receptor is therefore, considered to be High.

Operational and maintenance phase

MAGNITUDE OF IMPACT

16.9.2.6 Although Project Design Option 1 has 56 proposed WTGs and Project Design Option 2 has 47 proposed WTGs, the critical issue relevant to interference with civil and military PSR systems is the height of the WTGs and/or whether they are located in a location that is operationally relevant to the ATC unit potentially affected; both Project Design Options are assessed in this section.

16.9.2.7 **Both Project Design Options:** Given the distance of the Proposed Development from Dublin Airport (approximately 30 nm), and IAA's indication that adverse impacts are not expected (see Table 16.2), no adverse impacts on the Dublin PSR system are expected, regardless of the number of turbines or the tip height.

16.9.2.8 The impact is predicted to be of local spatial extent, short-term duration, without repetition and, if required, reversible. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be Negligible for both Project Design Options.

SIGNIFICANCE OF EFFECT

16.9.2.9 Following IAA's indication that no adverse impacts on the Dublin PSR system are expected, the magnitude of the impact has been assessed as **Negligible**, with the sensitivity of the receptor being **High**. Therefore, the significance of effect of interference with civil and military PSR systems as a result of operation of the proposed wind turbines is **Not Significant** for both Project Design Options, which is **not significant** in EIA terms.

PROPOSED MITIGATION

16.9.2.10 No mitigation is required above the factored in measures listed in Table 16.10.

16.9.2.11 The significance of effect of creating interference with civil and military PSR systems as a result of operating the proposed wind turbines is **Not Significant** in EIA terms for both Project Design Options. Consequently, no significant adverse residual effects have been predicted in respect of civil and military aviation for both Project Design Options.

16.10 Cumulative impacts assessment methodology

16.10.1 Methodology

16.10.1.1 The Cumulative Impact Assessment (CIA) takes into account the impacts associated with the Proposed Development together with other proposed and reasonably foreseeable projects, plans and existing and permitted projects. The projects and plans selected as relevant to the CIA presented within this chapter are based upon the results of a screening exercise (see Volume II, Appendix 3.2: CIA Screening Annex).

16.10.1.2 A tiered approach is adopted to provide an assessment of the Proposed Development as a whole. The tiering methodology is provided in Volume III, Appendix 3.2: CIA Screening.

16.10.1.3 Each project and plan has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon, effect-receptor pathways and the spatial/temporal scales involved. The specific projects scoped into this cumulative impact assessment, and the tiers into which they have been allocated are presented in Table 16.11. The operational projects included within the table are included due to their completion/commission subsequent to the data collection process for ABWP2 and as such not included within the baseline characterisation.

Table 16.11: List of other projects and plans considered within the cumulative impact assessment

Project/Plan	Status	Distance from Array Area (km)	Distance from Export Cable Corridors	Description of Project/Plan	Dates of construction	Dates of operation	Justification for screening in
Tier 3							
Decommissioning of ABWP1	Reasonably foreseen project / plan	0	0	Decommissioning of the seven existing WTGs at ABWP1	N/A	Decommissioning overlaps with four months of Proposed Development's construction phase (2025-2027)	Screened in as potential physical effect-receptor pathway.
Phase 1 Projects							
Codling Wind Park	Concept/Early Planning	18.2	17.3	Development of offshore wind turbine project.	2026 to 2028	2028 to 2053	Screened in as potential physical effect-receptor pathway.
Dublin Array	Concept/Early Planning	25.8	24.9	Development of offshore wind turbine project.	2026 to 2029	2029 to 2054	Screened in as potential physical effect-receptor pathway

16.10.1.4 Interference with civil and military PSR systems has been screened out of the cumulative impact assessment. As described in paragraph 16.9.2.6, given the distance of the Proposed Development from Dublin Airport (approximately 30 nm), no adverse impacts on the PSR system are expected and therefore the contribution of the Proposed Development to any potential cumulative impact is likely to be low. Also, as regards Codling Wind Park, it is not possible to quantify this impact (e.g. in terms of extent) at this stage, due to limited application material being available.

16.10.1.5 Table 16.12 presents the potential impacts, development phase, and the list of projects / plans with which the two Project Design Options have been cumulatively assessed.

Table 16.12: Cumulative assessment impacts, phases, scenarios, and projects to be considered cumulatively

Potential cumulative impact	Phase			Projects considered cumulatively	Justification for projects considered cumulatively
	C	O	D		
Creation of physical obstacles affecting air traffic	✓	✓	✓	Project parameters associated with Project Design Option 1 or 2 plus the following projects: **Tier 3** • Decommissioning of ABWP1 **Phase 1 Projects** • Codling Wind Park; • Dublin Array.	Includes the presence of other developments which have the potential to create physical obstacles affecting air traffic.

16.11 Cumulative impact assessment

16.11.1.1 A description of the significance of cumulative effects upon civil and military aviation arising from each identified impact is given below.

16.11.2 Project Design Option 1 and 2 - Impact 1 - Creation of physical obstacles affecting air traffic

Construction phase

SENSITIVITY OF THE RECEPTOR

16.11.2.1 The sensitivity of the receptor is as described in paragraphs 16.9.1.2 to 16.9.1.5 above.

TIER 3

MAGNITUDE OF IMPACT

16.11.2.2 The magnitude of impact for the Proposed Development alone is as described in paragraphs 16.9.1.7 to 16.9.1.12 above. Given the localised effect and short-term duration of the impact, the magnitude is considered to be Negligible for both Project Design Options.

16.11.2.3 In terms of cumulative impact, the Tier 3 project set out in Table 16.11 will have to implement the same factored-in measures as outlined in Table 16.10 for the Proposed Development. Consequently, when assessed cumulatively with the project set out in Table 16.11, the magnitude of the cumulative impact is considered to be Negligible for both Project Design Options.

SIGNIFICANCE OF EFFECT

16.11.2.4 Overall, the cumulative magnitude of the impact is deemed **Negligible** for both Project Design Options. The sensitivity of the receptor was deemed to be **High**. The effect for both Project Design Options will therefore be **Not Significant** considering the degree of overlap in decommissioning of the Tier 3 project. It is considered that the likelihood that the decommissioning phase for the Proposed Development will completely overlap is sufficiently small that the effect will be **not significant** in EIA terms.

TIER 3 + PHASE 1 PROJECTS

MAGNITUDE OF IMPACT

16.11.2.5 The magnitude of impact for the Proposed Development alone is as described in paragraphs 16.9.1.7 to 16.9.1.12 above. Given the localised effect and short-term duration of the impact, the magnitude is considered to be Negligible for both Project Design Options.

16.11.2.6 In terms of cumulative impact, all the projects/plans set out in Table 16.11 will have to implement the same factored-in measures as outlined in Table 16.10 for the Proposed Development. Consequently, when assessed cumulatively with the projects set out in Table 16.11, the magnitude of the cumulative impact is considered to be Negligible for both Project Design Options.

SIGNIFICANCE OF EFFECT

16.11.2.7 Overall, the cumulative magnitude of the impact is deemed **Negligible** for both Project Design Options. The sensitivity of the receptor was deemed to be **High**. The effect for both Project Design Options will therefore be **Not Significant** depending on the degree of overlap across projects. However, it is considered that the likelihood that the works for each of these projects will completely overlap is sufficiently small that the effect will be **not significant** in EIA terms.

Operational and maintenance phase

MAGNITUDE OF IMPACT

16.11.2.8 The magnitude of impact is as described in paragraphs 16.9.1.7 to 16.9.1.12 above. Based on both Project Design Options following implementation of the factored-in measures outlined in Table 16.10, and given the localised effect and medium-term duration of the impact, the Proposed Development alone magnitude is considered to be Negligible for both Project Design Options.

16.11.2.9 In terms of cumulative impact, all the projects/plans set out in will have to implement the same factored-in measures as outlined in Table 16.10. Consequently, when assessed cumulatively with the projects set out in Table 16.11, the magnitude of the cumulative impact is considered to be Negligible for both Project Design Options.

SIGNIFICANCE OF EFFECT

16.11.2.10 Overall, the cumulative magnitude of the impact is deemed **Negligible** for both Project Design Options. The sensitivity of the receptor was deemed to be **High**. The effect for both Project

Design Options will therefore be **Not Significant** depending on the degree of overlap in operation across projects. However, it is considered that the likelihood that the operational and maintenance phases for each of these projects will completely overlap is sufficiently small that the effect will be **not significant** in EIA terms.

Decommissioning phase

16.11.2.11 The effects of decommissioning activities are expected to be the same or similar to the effects from construction. The cumulative significance of effect is therefore **Not Significant,** which is **not significan**t in EIA terms.

16.12 Transboundary effects

16.12.1.1 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects with regard to civil and military aviation from the Proposed Development upon the interests of other states.

16.13 Summary of effects

16.13.1.1 Information on civil and military aviation within the Civil and Military Aviation and Radar Study Area was collected through a desktop review and consultation with the relevant stakeholders.

16.13.1.2 Table 16.13 and Table 16.14 present a summary of the potential impacts, mitigation measures and residual effects in respect to civil and military aviation for both Project Design Options. The impacts assessed include: creation of physical obstacles affecting air traffic; and interference with civil and military PSR systems. Overall, it is concluded that there will be no significant effects arising from the Proposed Development during the construction, operational and maintenance or decommissioning phases.

16.13.1.3 Table 16.12 presents a summary of the potential cumulative impacts, mitigation measures and residual effects. The cumulative impact assessed is the creation of physical obstacles affecting air traffic. Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects/plans.

16.13.1.4 No potential transboundary impacts have been identified in regard to effects of the Proposed Development.

Table 16.13: Summary of potential environmental impacts, mitigation and monitoring for Project Design Option 1

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
1. Creation of physical obstacles affecting air traffic	✓	✓	✓	Installation of appropriate lighting and marking in accordance with IAA guidance and specific DoD requirements to ensure compatibility with night vision equipment. IAA, DoD and IRCG consulted to ensure final layout is compatible with SAR helicopter operations and DoD aviation operations, and that night vision equipment requirements are met.	C: Negligible O: Negligible D: Negligible	C: High O: High D: High	C: Not Significant O: Not Significant D: Not Significant	N/A	C: Not significant O: Not significant D: Not Significant	N/A
2. Interference with civil and military PSR systems	✗	✓	✗	N/A	O: Negligible	O: High	O: Not Significant	N/A	O: Not significant	N/A

Table 16.14: Summary of potential environmental impacts, mitigation and monitoring for Project Design Option 2

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
1. Creation of physical obstacles affecting air traffic	✓	✓	✓	Installation of appropriate lighting and marking in accordance with IAA guidance and specific DoD requirements to ensure compatibility with night vision equipment. IAA, DoD and IRCG consulted to ensure final layout is compatible with SAR helicopter operations and DoD aviation operations, and that night vision equipment requirements are met.	C: Negligible O: Negligible D: Negligible	C: High O: High D: High	C: Not Significant O: Not Significant D: Not Significant	N/A	C: Not significant O: Not significant D: Not Significant	N/A
2. Interference with civil and military PSR systems	✗	✓	✗	N/A	O: Negligible	O: High	O: Not Significant	N/A	O: Not significant	N/A

16.14 References

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