codling wind park

Environmental Impact Assessment Report

Volume 3

Chapter 17 Aviation, Military and Radar


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Abbreviations

Abbreviation	Term in Full
AIC	Aeronautical Information Circular
AD	Air Defence
amsl	Above mean sea level
ASAM	Aeronautical Services Advisory Memorandum
ATC	Air Traffic Control
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CEA	Cumulative Effects Assessment
CTA	Control Area
CWP	Codling Wind Park
CWPL	Codling Wind Park Limited
DCCAE	Department of Communications, Climate Action and Environment
DoD	Department of Defence
DTTS	Department of Transport, Tourism and Sport
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIS	Environmental Impact Statement
ERCoP	Emergency Response and Cooperation Plan
EU	European Union
FIR	Flight Information Region
FL	Flight Level
ft	feet
FUA	Flexible Use of Airspace
IAA	Irish Aviation Authority
IAC	Inter array cables
IAIP	Integrated Aeronautical Information Package
IAM	Impact Assessment Matrix
ICAO	International Civil Aviation Organization
IFP	Instrument Flight Procedure
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions

Abbreviation	Term in Full
IRCG	Irish Coastguard
km	kilometres
LAT	Lowest Astronomical Tide
LMP	Lighting and Marking Plan
m	metres
MAP	Maritime Area Planning
MCA	Maritime and Coastguard Agency
MoD	Ministry of Defence
MSA	Minimum Safe Altitude
NATS	National Air Traffic Services
NAVAID	Navigation Aid
NM	Nautical Mile
NOTAM	Notice to Airmen
OSS	Offshore substation structure
PDA	Planning and Development Act
PSR	Primary Surveillance Radar
RLOS	Radar Line of Sight
SAR	Search and Rescue
SSR	Secondary Surveillance Radar
TMZ	Transponder Mandatory Zone
UK	United Kingdom
VFR	Visual Flight Rules
WMO	World Meteorological Organisation
ZoI	Zone of influence

Definitions

Glossary	Meaning
above mean sea level (amsl)	The elevation or altitude (in the air) of an object, relative to the average sea level datum.
the Applicant	The developer, Codling Wind Park Limited (CWPL).
array site	The red line boundary area within which the wind turbine generators (WTGs), inter array cables (IACs) and the Offshore Substation Structures (OSSs) are proposed.
Codling Wind Park (CWP) Project	The proposed development as a whole is referred to as the Codling Wind Park (CWP) Project, comprising the offshore infrastructure, the onshore infrastructure and any associated temporary works.
Codling Wind Park Limited (CWPL)	A joint venture between Fred. Olsen Seawind (FOS) and Électricité de France (EDF) Renewables, established to develop the CWP Project.
Environmental Impact Assessment Report (EIAR)	The report prepared by the Applicant to describe the findings of the EIA for the CWP Project.
export cables	The cables, both onshore and offshore, that connect the offshore substations with the onshore substation.
generating station	Comprising the wind turbine generators (WTGs), inter array cables (IACs) and the interconnector cables.
high water mark (HWM)	The line of high water of ordinary or medium tides of the sea or tidal river or estuary.
Flight Information Region (FIR)	A specified region of airspace in which a flight information service and an alerting service are provided
Flight Level (FL)	A standard nominal altitude of an aircraft, in hundreds of feet, based upon a standardised air pressure at sea level.
Instrument Flight Procedure (IFP)	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.
limit of deviation (LoD)	Locational flexibility of permanent and temporary infrastructure is described as a LoD from a specific point or alignment.
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.
offshore development area	The total footprint of the offshore infrastructure and associated temporary works including the array site and the OECC.
offshore export cables	The cables which transport electricity generated by the WTGs from the offshore substations (OSSs) to the TJBs at the landfall.
offshore export cable corridor (OECC)	The area between the Array Site and the landfall, within which the offshore export cables cable will be installed along with cable protection and other temporary works for construction.

Glossary	Meaning
offshore infrastructure	The permanent offshore infrastructure, comprising of the WTGs, IACs, OSSs, Interconnector cables, offshore export cables and other associated infrastructure such as cable and scour protection.
offshore substation structure (OSS)	A fixed structure located within the array site, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
operations and maintenance (O&M) activities	Activities (e.g., monitoring, inspections, reactive repairs, planned maintenance) undertaken during the O&M phase of the CWP Project.
O&M phase	This is the period of time during which the CWP project will be operated and maintained.
Primary Surveillance Radar (PSR)	A radar system that measures the bearing and distance of targets using the detected reflections of radio signals.
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.
zone of influence (ZoI)	Spatial extent of potential impacts resulting from the project.

17 AVIATION, MILITARY AND RADAR

17.1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13–22 kilometres (km) off the east coast of Ireland, at County Wicklow.

2. This chapter forms part of the Environmental Impact Assessment Report (EIAR) for the CWP Project. The purpose of the EIAR is to provide the decision-maker, stakeholders and all interested parties with the environmental information required to develop an informed view of any likely significant effects resulting from the CWP Project, as required by the European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the Environmental Impact Assessment (EIA) Directive).

3. This EIAR chapter describes the potential impacts of the CWP Project's Offshore Infrastructure on aviation, military and radar during the construction, operation and maintenance, and decommissioning phases. The receptors considered in this chapter include:

   - Airspace designations;
   - Military aviation operations;
   - Military exercise and training areas;
   - Civil airports;
   - Helicopters; and
   - Civil and military radar (including Met Eireann meteorological radar).

4. In summary, this EIAR chapter:

   - Details the EIA scoping and consultation process undertaken and sets out the scope of the impact assessment for aviation, military and radar;
   - Identifies the key legislation and guidance relevant to aviation, military and radar, with reference to the latest updates in guidance and approaches;
   - Confirms the study area for the assessment and presents the impact assessment methodology for aviation, military and radar;
   - Describes and characterises the baseline environment for aviation, military and radar, established from desk studies, project survey data and consultation;
   - Defines the project design parameters for the impact assessment and describes any embedded mitigation measures relevant to the aviation, military and radar assessment;
   - Presents the assessment of potential impacts on aviation, military and radar, and identifies any assumptions and limitations encountered in compiling the impact assessment; and
   - Details any additional mitigation and / or monitoring necessary to prevent, minimise, reduce or offset potentially significant effects identified in the impact assessment.

5. The assessment should be read in conjunction with **Appendix 17.1 Cumulative Effects Assessment**, which considers other plans, projects and activities that may act cumulatively with the CWP Project and provides an assessment of the potential cumulative impacts on aviation, military and radar.

6. A summary of the CEA for aviation, military and radar is presented in **Section 17.11**.

7. Additional information to support the assessment includes:

   - **Appendix 17.2 Representative Scenario and Limit of Deviation Assessment**; and
   - **Appendix 17.3 Codling Wind Park Dublin Airport Special Aeronautical Study (ASAP S.R.O. dated 26 March 2023).**

17.2 Consultation

8. Consultation with statutory and non-statutory organisations is a key part of the EIA process. Consultation with regard to aviation, military and radar has been undertaken to inform the approach and scope of the assessment.

9. The key elements to date have included EIA scoping, consultation events and ongoing topic- specific meetings with key stakeholders which, in particular for aviation, military and radar, have included the Irish Aviation Authority (IAA), Ireland's Department of Defence (DoD), Met Eireann, the United Kingdom (UK) Ministry of Defence (MoD) and Isle of Man (Ronaldsway) Airport. The feedback received throughout this process has been considered in preparing the EIAR. EIA consultation is described further in **Chapter 5 EIA Methodology,** the **Planning Documents** and in the **Public and Stakeholder Consultation Report**, which has been submitted as part of the development permission application.

10. **Table 17-1** provides a summary of the key issues raised during the consultation process relevant to aviation, military and radar, and details how these issues have been considered in the production of this EIAR chapter.

Table 17-1 Consultation responses relevant to aviation, military and radar

Consultee	Comment	How issues have been addressed
Scoping responses		
MoD 20 January 2021	MoD responded to the CWP Offshore Scoping Report 2021 and noted that the development falls within Irish Territorial Waters. As such, they would expect the turbines to be lit in accordance with IAA regulations; on which basis, they confirmed that they had no objection to, or concerns about, the impacts of the proposed development.	The Applicant accepts that the WTGs will be lit in accordance with IAA regulations. Potential impact on MoD operations is discussed further in this table.
Topic specific meetings		
IAA[1] 30 August 2022	Meeting at IAA offices in Dublin to introduce CWP Project and discuss potential impact on IAA aviation operations.	Potential impact on IAA operations is discussed in **Section 17.6**.
Other		
DoD 9 August 2022	Email correspondence introducing CWP Project to DoD and requesting assessment of potential impact on DoD operations. DoD holding response received on 10 August 2022.	No response received. Potential impact on DoD operations is discussed in **Section 17.6**.
MoD 9 August 2022	Email correspondence re-introducing CWP Project to MoD and requesting assessment of potential transboundary impact on MoD operations. MoD responded on 15 November	The Applicant accepts that MoD operations will not be affected by the proposed development. No further assessment on MoD

[1] IAA was consulted prior to its airspace design function being assigned to AirNav Ireland.

Consultee	Comment	How issues have been addressed
	2022 referring the Applicant to their scoping response dated 20 January 2021.	operations is required in this chapter.
Newcastle Aerodrome 3 April 2023	Phone call with owner of Newcastle Aerodrome to discuss potential impact on aviation operations.	Newcastle Aerodrome operations are discussed further in **Section 17.6**. However, it has been confirmed that the proposed development is outside the routine operational area of Newcastle Aerodrome. Consequently, this potential impact has been scoped out of the EIAR.
Met Eireann 20 April 2023 31 October 2023 9 January 2024	Email correspondence introducing CWP Project to Met Eireann and requesting assessment of potential impact on Met Eireann radar operations. Met Eireann responded by email on 15 January 2024 requesting that an appropriate assessment of potential impact on met radars be carried out to ensure compliance with the World Meteorological Organisation (WMO) Guide to Meteorological Instruments and Methods of Observations (WMO-No.8).	Potential impact on Met Eireann operations is discussed in **Section 17.6**.
NATS (National Air Traffic Services) 20 April 2023	Email correspondence introducing CWP Project to NATS and requesting assessment of potential impact (including transboundary) on NATS operations.	NATS responded by email on 13 November 2023 confirming that the area in question is outside that covered by NATS infrastructure and, therefore, no impact is anticipated. While the airspace in question is in the Shannon FIR, and within the area of interest for the Swanwick Centre, it is outside their remit. Accordingly, NATS do not have any concerns in respect of their own operations. Consequently, this potential impact has been scoped out of the EIAR.
Isle of Man (Ronaldsway) Airport 31 October 2023	Email correspondence introducing CWP Project to Isle of Man (Ronaldsway) Airport and requesting assessment of potential impact (including transboundary) on Air Traffic Control (ATC) radar operations.	Awaiting response. Email re-sent on 9 January 2024.
DoD 20 December 2023	DoD response to the Offshore EIA Scoping Report confirming the aviation lighting requirements for military aviation operations.	Potential impact on DoD aviation operations is discussed in **Section 17.6**.

Consultee	Comment	How issues have been addressed
MoD 4 March 2024	MoD response to the Offshore EIA Scoping Report confirming that MoD has no objection to the proposed development.	The Applicant accepts that MoD operations will not be affected by the proposed development. No further assessment on MoD operations is required in this chapter.

17.3 Legislation, policy and guidance

17.3.1 Legislation

11. The legislation that is applicable to the assessment of aviation, military and radar is summarised below. Further detail is provided in **Chapter 2 Policy and Legislative Context**.

- International Civil Aviation Organization (ICAO) Annex 14 – Aerodromes;
- Doc 8168 – ICAO Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS);
- EU Regulation 923/2012 – Standardized European Rules of the Air;
- IAA Order (1999) En-Route Obstacles to Air Navigation; and
- IAA Order (2005) Obstacles to Aircraft in Flight.

17.3.2 Policy

12. The overarching planning policy relevant to the CWP Project is described in EIAR **Chapter 2 Policy and Legislative Context**.

13. The assessment of the CWP Project against relevant planning policy is provided in the **Planning Report**. This includes planning policy relevant to aviation, military and radar.

17.3.3 Guidance

14. The principal guidance and best practice documents used to inform the assessment of potential impacts on aviation, military and radar is summarised below.

- IAA (En-Route Obstacles to Air Navigation) Order 1999;
- IAA (Guidance Material for Obstruction Surveys) Aeronautical Services Advisory Memorandum (ASAM) No: 023, Issue 2 2015;
- IAA (Guidance Material on Off-Shore Wind Farms) ASAM No: 018, Issue 2 2015;
- IAA (Obstacles to Aircraft in Flight) Order 2005;
- IAA Integrated Aeronautical Information Package (IAIP), 2023; and
- IAA VFR Aviation Chart 1:500,000, 2023.

17.4 Impact assessment methodology

15. **Chapter 5 EIA Methodology** provides a summary of the general impact assessment methodology applied to the CWP Project.

16. The following sections confirm the methodology used to assess the potential impacts on aviation, military and radar.

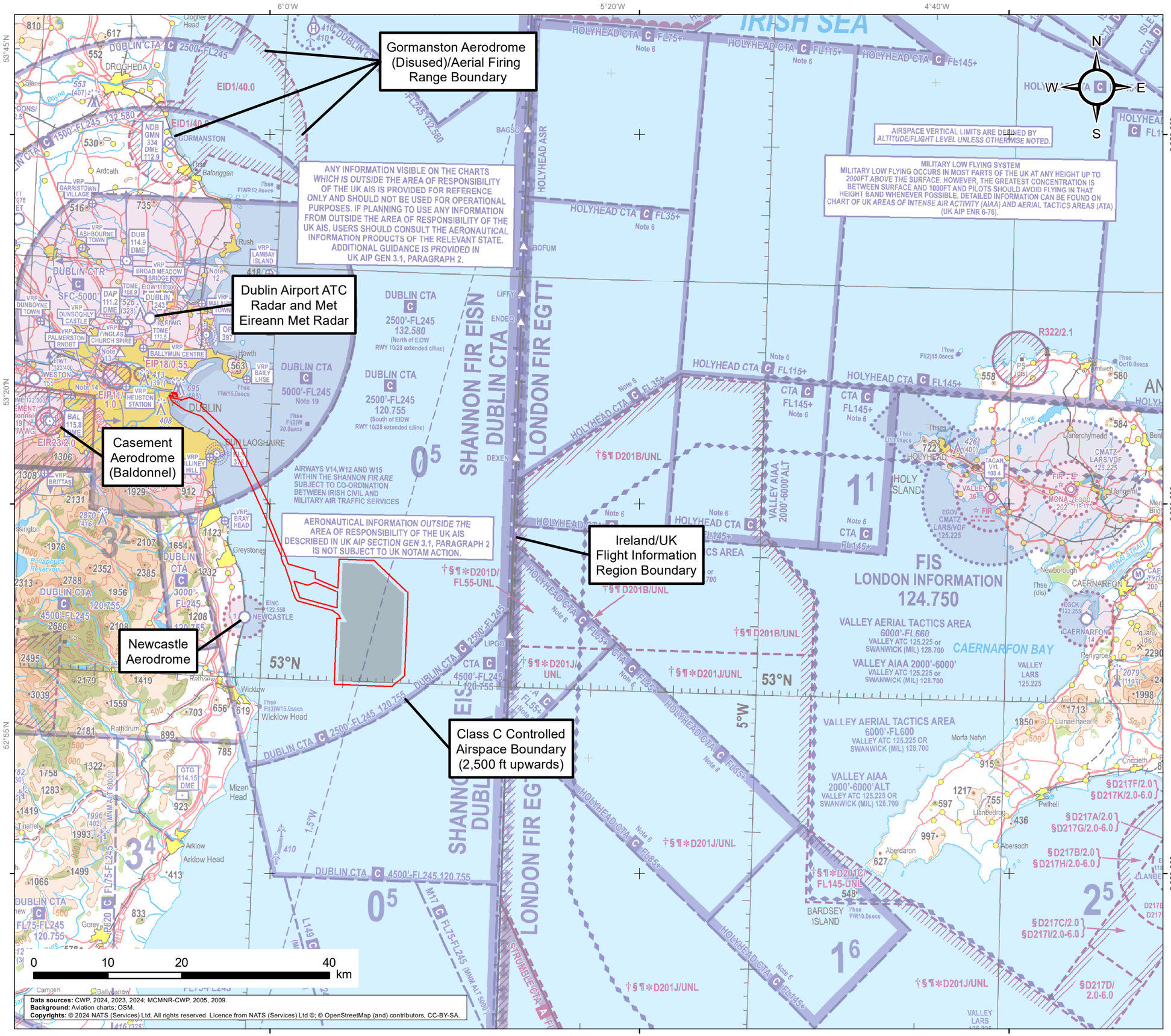
17. The approach to the assessment of cumulative impacts, transboundary impacts and inter-related effects is provided in **Sections 17.11**, **17.12** and **17.13** respectively.

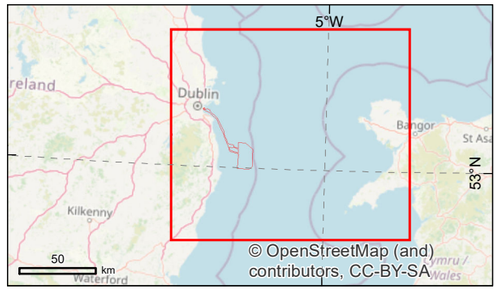
17.4.1 Study area

18. The aviation, military and radar study area is shown in **Figure 17-1** below. This includes the offshore development area and offshore export cable corridor (OECC), as well as all areas that are within the zone of influence (ZoI) of the CWP Project that are of relevance to aviation, military and radar receptors. This includes:

- The airspace area designations including military exercise areas that intersect or are adjacent to the offshore development area and offshore export cable corridor;
- The airspace used by helicopters on routes which may cross the offshore development area (no helicopters will be used to service the CWP Project during the operation and maintenance phase, however emergency helicopters may require access to the offshore development area in the event of life-critical Search and Rescue (SAR) operations);
- Radars on the east coast of Ireland that could potentially detect wind turbines with tip heights up to 314 metres (m) above Lowest Astronomical Tide (LAT) within the offshore development area; and
- The area within 9 nautical miles (NM) of the offshore development area boundaries (based on the potential for offshore oil and gas platforms and their associated 9 NM consultation zones).

19. **Figure 17-1** displays all aeronautical information within the proposed study area, however only airspace designations relevant to the CWP Project are labelled.





Legend

- Planning application boundary
- Array site

codling wind park	*Project:* Codling Wind Park	*Contractor:* Coleman Aviation

Figure 17.1
Aviation charts

CWP doc. number: CWP-CWP-ENG-08-01-MAP-1096

Internal descriptive code:	*Size:*	*CRS:*
ALL - PAB..WF.RLB - B.AVIATION - EIAR.FIG.17.01	A3 *Scale:* 1:500,000	EPSG 25830

Rev.	*Updates*	*Date*	*By*	*Chk'd*	*App'd*
00	Final for issue	2024/07/23	MC	CMD	SL

17.4.2 Data and information sources

Site specific surveys

20. An Instrument Flight Procedure (IFP) assessment, by ASAP S.R.O., has been carried out to identify whether the proposed development would have an adverse impact on Dublin Airport's published IFPs. The ASAP S.R.O report can be found at **Appendix 17.3 Codling Wind Park Dublin Airport Special Aeronautical Study**.

21. No other site-specific surveys have been undertaken to inform the EIAR for aviation, military and radar. This is because the baseline characterisation developed through existing data sources and consultation is considered sufficient to inform the aviation, military and radar chapter.

Desk study

22. In addition to the site-specific IFP survey, a comprehensive desk-based review was undertaken to inform the baseline for aviation, military and radar. Key data sources used to inform the assessment are set out in **Table 17-2**.

Table 17-2 Data sources

Data	Source	Date	Author
Arklow Bank Wind Park Environmental Impact Statement (EIS) 2001	Sure Partners Ltd	2001	Sure Partners Ltd
Codling Wind Park Dublin Airport Special Aeronautical Study	ASAP S.R.O.	2023	ASAP S.R.O.
CWP Offshore Scoping Report	Codling Wind Park Limited (CWPL)	2020	CWPL
CWP Onshore Infrastructure Scoping Report	CWPL	2021	CWPL
ENR 1.6: Radar services and procedures	IAA IAIP	2023	IAA
ENR 2.1: Air traffic services airspace	IAA IAIP	2023	IAA
ENR 5.2: Military exercise and training areas	IAA IAIP	2023	IAA
ENR 5.5: Aerial sporting and recreational activities	IAA IAIP	2023	IAA
ENR 6.1: Lower ATS routes	IAA IAIP	2023	IAA

Data	Source	Date	Author
Oil and Gas Latest Licence Acreage Report and Concession Map	Department of Communications, Climate Action and Environment (DCCAE)	2020	DCCAE

17.4.3 Impact assessment

23. The significance of potential effects has been evaluated using a systematic approach, based upon identification of the importance / value of receptors and their sensitivity to the project activity, together with the predicted magnitude of the impact.

24. In the absence of published policy and guidance for determining the effects of wind farms on aviation receptors, the terms used to define receptor sensitivity and magnitude of impact are based on expert judgement. Criteria have been adopted in order to implement a specific methodology for aviation, military and radar.

Sensitivity of receptor

25. For each effect, the assessment identifies receptors sensitive to that effect and implements a systematic approach to understanding the impact pathways and the level of impacts on given receptors.

26. Receptor sensitivity is determined by considering a combination of value, tolerance, adaptability and recoverability. The definitions of receptor sensitivity for the purpose of the aviation, military and radar assessment are provided in **Table 17-3**.

Table 17-3 Criteria for determination of receptor sensitivity

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

Magnitude of impact

27. The scale or magnitude of potential impacts (both beneficial and adverse) depends on the degree and extent to which the CWP Project activities may change the environment, which usually varies according to project phase (i.e., construction, operation and maintenance, and decommissioning).

28. Factors that have been considered to determine the magnitude of potential impacts include:

- Area of influence / spatial extent;
- Level of deviation from baseline conditions;
- Duration of impact; and
- Frequency of repetition of impact.

29. The criteria for defining magnitude of impact for the purpose of the aviation, military and radar assessment are provided in **Table 17-4**.

Table 17-4 Criteria for determination of magnitude of impact

Magnitude	Criteria
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 project and / or frequency of repetition is continuous and / or effect is not reversible for project).
Medium	Loss or alteration to significant portions of key components of current activity and / or physical extent of impact is moderate and / or medium-term duration (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., less than two years) and / or frequency of repetition is negligible to continuous and / or effect is reversible.

Significance of effect

30. As set out in **Chapter 5 EIA Methodology**, an Impact Assessment Matrix (IAM) is used to determine the significance of an effect. In basic terms, the potential significance of an effect is a function of the sensitivity of the receptor and the magnitude of the impact, as shown in **Table 17-5**.

31. The matrix provides a framework for the consistent and transparent assessment of predicted effects across all technical chapters. However it is important to note that individual assessments are based on relevant guidance and the application of professional judgement.

32. The matrix provides levels of effect significance ranging from ‘Negligible; to ‘Major’ as defined in the Environmental Protection Agency (EPA) (2022) EIAR Guidelines. For the purposes of this assessment, potential effects identified to be of Moderate Significance or above are considered to be significant in EIA terms and additional mitigation will be required. Effects identified as less than Moderate Significance are generally considered to be not significant in EIA terms.

Table 17-5 Impact assessment matrix for determination of significance of effect

Sensitivity of receptor	Magnitude of impact			
	High	Medium	Low	Negligible
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Moderate	Minor	Negligible
Low	Minor	Minor	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

17.5 Assumptions and limitations

33. No overarching assumptions or limitations have been identified that apply to the assessment for aviation, military and radar. Where routine assumptions have been made in the course of undertaking the assessment, these are noted in the following sections.

17.6 Existing environment

34. The following section provides a description of the baseline conditions for aviation, military and radar, and should be read in conjunction with **Figure 17-1**.

17.6.1 Airspace designations

35. Ireland operates under the Flexible Use of Airspace (FUA) management concept, described by ICAO and developed by the European Organisation for the Safety of Air Navigation (Eurocontrol). The main principle of the FUA concept is that airspace should not be designated as civil or military airspace but is considered as one continuum in which all users' requirements are accommodated to the maximum extent possible. Any necessary airspace reservation or segregation is temporary, based on real-time usage within a specific time period (Department of Transport, Tourism and Sport (DTTS) et al., 2014).

36. The offshore development area is located underneath the Dublin Control Area (CTA) (see **Figure 17-1**), within which the IAA is the main provider of air navigation services. The IAA is a commercial semi-state company under the DTTS. The principal statutory functions of the IAA are to:

- Provide, or make arrangements for, the provision of air navigation services in Ireland's airspace (including adjacent airspace under international agreements);
- Provide communication services over the eastern part of the North Atlantic Region;
- Provide terminal (air traffic control (ATC)) services at Cork, Dublin and Shannon airports; and
- Regulate the safety of Ireland's civil aviation industry and oversee civil aviation security in the state.

37. In line with international aviation regulations, airspace in Ireland is categorised into seven classifications (Class A to Class G); the services provided within each classification are based on speed limitations, types of flights and rules for separation of aircraft. The offshore development area is located in an area of Class G uncontrolled airspace which is established from the surface up to 2,500 feet (ft) above mean sea level (amsl). Above this altitude, Class C controlled airspace is

established up to Flight Level (FL) 245 (24,500 ft) which forms part of the Dublin CTA. 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 Visual Flight Rules (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.

38. The offshore development area is located entirely in Irish airspace, and within the Shannon Flight Information Region (FIR). An FIR is the airspace within which an ATC authority's responsibility is bounded. The FIR boundary between Irish and UK airspace is located 8 NM to the east of the offshore development area where the Shannon FIR borders the Scottish FIR; see **Figure 17-1**.

17.6.2 Military aviation operations

39. Ireland's DoD Air Corps operates 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 nearest DoD aerodrome to the offshore wind farm area is Casement Aerodrome, Baldonnel (24 NM northwest); Gormanston Aerodrome (35 NM north-northwest) is disused.

17.6.3 Military exercise and training areas

40. The nearest military exercise and training area is the Gormanston Military Aerial Firing Range located approximately 35 NM to the north-northwest of the offshore development area. Although Gormanston Aerodrome is disused, the Ireland IAIP states that the firing range operates from the site of Gormanston Aerodrome and extends seaward; it is used for air-ground firing training, air-defence training and general military training. It does not overlap with the offshore development area or offshore export cable corridor; see **Figure 17-1**.

17.6.4 Civil airports

41. The nearest major civil airport to the CWP Project is Dublin Airport located 23 NM to the northwest. The offshore development area and offshore export cable corridor are within the statutory safeguarding zone for an airport of this nature. As a result, the Applicant commissioned ASAP S.R.O., an EU-accredited procedure design company, to carry out an IFP assessment of the potential impact on Dublin Airport's procedures. The ASAP S.R.O. report (**Appendix 17.3 Codling Wind Park Dublin Airport Special Aeronautical Study**) concluded that Dublin Airport's IFPs will not be affected by the proposed development.

42. Newcastle Aerodrome is the nearest licensed aerodrome to the CWP Project located approximately 8 NM west of the offshore development area; the aerodrome is not radar equipped. Although technically outside the statutory consultation zone (5 km) for an aerodrome of this nature, the owner of the aerodrome has been consulted (see **Table 17-1**) and confirmed that the CWP Project will not impact on Newcastle Aerodrome's operations.

17.6.5 Helicopters

43. Helicopters must avoid vessels and structures by keeping a minimum distance of 500 ft. In visual conditions, pilots may use designated helicopter routes or they may opt to fly direct to their destination in open airspace. When operating in poor weather, pilots must fly in accordance with Instrument Flight Rules (IFR) in which helicopters require a Minimum Safe Altitude (MSA) of 1,000 ft height clearance from obstacles within 5 NM of the aircraft.

44. To help achieve a safe operating environment, UK guidance requires a consultation zone of 9 NM radius around offshore helicopter destinations. No comparable guidance has been identified for Ireland and therefore UK guidance has been considered for the CWP Project. There are presently no helicopter routes or offshore helicopter destinations in the vicinity of the offshore development area. There is no oil and gas infrastructure including platforms, subsea facilities or wells which may require helicopter access within 9 NM of the offshore development area. No regular helicopter flight paths servicing the oil and gas industry are therefore anticipated to cross the offshore development area.

45. In Ireland, the Irish Coast Guard (IRCG) operates 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. SAR is also considered within **Chapter 16 Shipping and Navigation**.

46. Any civilian helicopter activity in the area will be planned and managed as single flights, likely operating out of Dublin Airport or other regional aerodromes.

17.6.6 Civil and military radar (including Met Eireann meteorological radar)

47. Civil airspace and air traffic surveillance and management infrastructure is comprised of the following systems:

- Primary Surveillance Radar (PSR);
- Secondary Surveillance Radar (SSR); and
- Aeronautical Navigation Aids (NAVAIDs).

48. These are discussed in turn below, followed by military and meteorological radar systems.

PSR

49. PSRs are used for non-co-operative surveillance and to provide ATS to aircraft arriving and departing to / from aerodromes and airports and in the transit phase of flight. The IAA use PSR primarily for civil airport and military airfield operations in Ireland. There are three PSRs in Ireland located at Cork, Dublin and Shannon airports. The nearest PSR to the offshore development area is located at Dublin Airport approximately 24 NM northwest.

50. In the UK, National Air Traffic Services (NATS) use PSRs to support their provision of navigational services to aircraft operating between the UK and mainland Europe and to those overflying the UK FIR. Surveillance data from NATS PSRs is also used by other air traffic service providers such as the UK MoD and civilian airports. UK military ATC units are based in NATS Control Centres to facilitate the control of aircraft that require ATC services outside the civil airspace structure.

SSR

51. SSR is used in conjunction with PSR to provide additional information about aircraft. SSR is used for co-operative surveillance of aircraft arriving and departing to / from aerodromes and airports and in the transit phase of flight. Only aircraft with a transponder can be detected by SSR.

52. The nearest SSR to the offshore development area is located at Dublin Airport, approximately 24 NM northwest which is outside the relevant safeguarding distances as per ICAO EUR DOC 015 (ICAO, 2015) and CAP 670 (UK Civil Aviation Authority (CAA), 2022).

NAVAIDS

53. No aeronautical radio navigation beacons have been identified in proximity to the offshore development area. In Ireland, all NAVAIDs are located on land and the offshore development area is outside the relevant safeguarding distances as per ICAO EUR DOC 015 (ICAO, 2015) and CAP 670 (CAA, 2022).

Military radar

54. In Ireland, military ATS are provided by the Irish Air Corps using radar data fed directly from IAA-operated PSRs. At Casement Aerodrome (23 NM northwest of the offshore development area), military controllers provide ATS using radar data from the Dublin Airport PSR. Ireland's DoD has no dedicated PSRs that require safeguarding from the potential effects of the offshore development area.

55. The UK MoD is responsible for defence and security of UK airspace. The closest Air Defence (AD) radar in the UK to the CWP Project is at Brizlee Wood, over 300 km away in the northeast of England. There are no military AD, or ATC, radars on the west coast of mainland UK that could have line of sight to the CWP Project.

Met Eireann meteorological radar

56. Meteorological radar detects precipitation and estimates its type, severity and motion. The nearest Met Eireann meteorological radar to the proposed development is located at Dublin Airport, with the closest WTG situated 42 km to the southeast of the radar. In their consultation response (**Table 17-1**), Met Eireann requested an assessment be carried out of potential impact on meteorological radars to ensure compliance with the WMO's Guide to Meteorological Instruments and Methods of Observations (WMO-No.8). At 42 km, the proposed development lies at the extremity of the 20–45 km range which is specified in WMO-No.8 as a low impact zone. It is noted that, in France, met radars are typically safeguarded within 30 km of their location (Meteo France, 2010) and that in the UK, the recognised consultation distance for a radar of this nature is 20 km; however, the proposed development is within a WMO notified low impact zone for meteorological radar systems.

17.6.7 Climate change and natural trends

57. Climate change and natural trends have been considered as part of the aviation, military and radar assessment; however it is concluded that, due to the unique nature of aviation operations, there will be no implications for aviation, military and radar operations related to climate change and natural trends.

17.6.8 Predicted future baseline

58. There are no anticipated future changes to the airspace environment in the vicinity of the CWP Project that will affect this assessment of the impact on aviation, military and radar.

17.7 Scope of the assessment

59. An EIA Scoping Report for the Offshore Infrastructure was published on 6 January 2021. The Scoping Report was uploaded to the CWP Project website and shared with regulators, prescribed bodies and other relevant consultees, inviting them to provide relevant information and to comment on the proposed approach being adopted by the Applicant in relation to the offshore elements of the EIA.

60. Based on responses to the Scoping Report, further consultation and refinement of the CWP Project design, potential impacts to aviation, military and radar scoped into the assessment are listed below in **Table 17-6**. It should be noted that adverse effects on ATC radar are only possible if the wind turbine blades are moving; therefore, this impact is applicable to the operation and maintenance phase only.

Table 17-6 Potential impacts scoped into the assessment

Impact no.	Description of impact	Notes
Construction		
Impact 1	Potential impact on Dublin Airport IFPs due to presence of wind turbines.	Impact on Dublin Airport IFPs is discussed in **Section 17.10**.
Impact 2	Potential impact on low flying (including IRCG SAR helicopter operations) due to presence of obstacles (cranes, stationary wind turbines, offshore substation structure (OSS)).	Impact on low flying (including IRCG SAR helicopter operations) is discussed in **Section 17.10**.
Operation and maintenance		
Impact 1	Potential impact on Dublin Airport ATC radar due to presence of wind turbines.	Impact on Dublin Airport ATC radar is discussed in **Section 17.10**.
Impact 2	Potential impact on Met Eireann Dublin Airport meteorological radar due to presence of wind turbines.	Impact on Met Eireann Dublin Airport meteorological radar is discussed in **Section 17.10**.
Decommissioning		
The effects of decommissioning activities are expected to be the same as or similar to the effects from the construction phase.		
Impact 1	Potential impact on Dublin Airport IFPs due to presence of wind turbines during decommissioning.	Impact on Dublin Airport IFPs is discussed in **Section 17.10**.
Impact 2	Potential impact on low flying (including IRCG SAR helicopter operations) due to presence of obstacles (cranes, stationary wind turbines, offshore substation structure (OSS)) during decommissioning.	Impact on low flying (including IRCG SAR helicopter operations) is discussed in **Section 17.10**.

61. Based on responses to the Scoping Report, further consultation and refinement of the CWP Project design, potential impacts to aviation, military and radar scoped out of the assessment are listed below in **Table 17-7**.

Table 17-7 Potential impacts scoped out of the assessment

Description of impact	Justification for scoping out
Potential impact of wind turbines on Newcastle Aerodrome procedures	The operator of Newcastle Aerodrome has confirmed that the CWP Project will not adversely impact on their operations.
Potential impact on DoD operations within the Military Aerial Firing Range at Gormanston	Gormanston Military Aerial Firing Range is located approximately 35 NM to the north-northwest of the offshore development area; consequently, there is no spatial overlap with the CWP Project construction, operation and maintenance or decommissioning activities and no meaningful effect-receptor pathway.
Wind turbines will create physical obstacles to routine helicopter traffic	There are no identified routine flight paths that cross the offshore development area. As no regular users of the airspace have been identified, and due to the designed-in measures which include ensuring that wind turbines are lit in accordance with IAA ASAM No.18 (IAA, 2015a) and informing the IAA of the locations, heights and lighting status of the wind turbines (**Table 17-10**), this impact has been scoped out of further assessment.
Potential impact on MoD operations	MoD responded to the CWP Offshore Scoping Response on 20 January 2021 (reiterated on 15 November 2022) confirming that, as the development falls within Irish Territorial Waters and that the turbines will be lit in accordance with IAA regulations, they had no objection to, or concerns about, the impacts of the proposed development. As there is no meaningful effect-receptor pathway this impact has therefore been scoped out of further assessment.

17.8 Assessment parameters

17.8.1 Background

62. Complex, large-scale infrastructure projects with a terrestrial and marine interface such as the CWP Project, are consented and constructed over extended timeframes. The ability to adapt to a changing supply chain, policy or environmental conditions and to make use of the best available information to feed into project design, promotes environmentally sound and sustainable development. This ultimately reduces project development costs and therefore electricity costs for consumers, and reduces CO_2 emissions.

63. In this regard, the approach to the design development of the CWP Project has sought to introduce flexibility where required, among other things, to enable the best available technology to be constructed and to respond to dynamic maritime conditions, while at the same time to specify project boundaries, project components and project parameters wherever possible, having regard to known environmental constraints.

64. **Chapter 4 Project Description** describes the design approach that has been taken for each component of the CWP Project. Wherever possible, the location and detailed parameters of the CWP Project components are identified and described in full within the EIAR. However, for the reasons

outlined above, certain design decisions and installation methods will be confirmed post-consent, requiring a degree of flexibility in the planning consent.

65. Where necessary, flexibility is sought in terms of:

- Up to two options for certain permanent infrastructure details and layouts such as the WTG layouts.
- Dimensional flexibility; described as a limited parameter range, i.e., upper and lower values for a given detail such as cable length.
- Locational flexibility of permanent infrastructure; described as limit of deviation (LoD) from a specific point or alignment.

66. The CWP Project had to procure an opinion from An Bord Pleanála to confirm that it was appropriate that this application be made and determined before certain details of the development were confirmed. An Bord Pleanála issued that opinion on 25 March 2024 (as amended in May 2024) and it confirms that the CWP Project could make an application for permission before the details of certain permanent infrastructure described in **Section 4.3** of **Chapter 4 Project Description** is confirmed.

67. In addition, the application for permission relies on the standard flexibility for the final choice of installation methods and O&M activities.

68. Notwithstanding the flexibility in design and methods, the EIAR identifies, describes and assesses all the likely significant impacts of the CWP Project on the environment.

17.8.2 Options and dimensional flexibility

69. Where the application for permission seeks options or dimensional flexibility for infrastructure or installation methods, the impacts on the environment are assessed using a representative scenario approach. A representative scenario is a combination of options and dimensional flexibility that has been selected by the author of this EIAR chapter to represent all the likely significant effects of the project on the environment. Sometimes, the author will have to consider several representative scenarios to ensure all impacts are identified, described and assessed.

70. For aviation, military and radar, this analysis is presented in **Appendix 17.2 Representative Scenario and Limit of Deviation Assessment** which identifies one or more representative scenarios for each impact with supporting text to demonstrate that no other scenarios would give rise to new or materially different effects. This takes into consideration the potential impact of other scenarios on the magnitude of the impact or the sensitivity of the receptor(s) that is being considered. **Table 17-8** and **Table 17-9** below, present a summarised version of **Appendix 17.2 Representative Scenario and Limit of Deviation Assessment** and describe the representative scenarios on which the construction and O&M phase aviation, military and radar assessment has been based. Where options exist, for each receptor and potential impact, the table identifies the representative scenario and provides a justification for this.

17.8.3 Limit of deviation (LoD)

71. Where the application for permission seeks locational flexibility for infrastructure, the impacts on the environment are assessed using a LoD. The LoD is the furthest distance that a specified element of the CWP Project can be constructed.

72. This chapter assesses the specific preferred location for permanent and temporary infrastructure. However, **Appendix 17.2 Representative Scenario and Limit of Deviation Assessment** provides further analysis to determine if the proposed LoD for permanent and temporary infrastructure may give

rise to any new or materially different effects, taking into consideration the potential impact of the proposed LoD on the magnitude of the impact.

73. For aviation, military and radar this analysis is summarised in **Table 17-9**.

Table 17-8 Representative scenario – aviation, military and radar construction phase impacts

Impact	Representative scenario details	Value	Notes / assumptions
Construction			
Impact 1: Potential impact on Dublin Airport IFPs due to presence of wind turbines.	Permanent infrastructure		The temporary disturbance relates to use of construction infrastructure (e.g., cranes) that could conceivably extend beyond the maximum turbine tip height during WTG installation. It should be noted however that, in accordance with the Project Description, it is not planned to use cranes, or any other lifting systems, that will extend above the maximum height of the WTGs. WTG Option B forms the representative scenario as this represents the greatest level of effect on aviation, and therefore Option B forms the presentational basis of the assessment for Impact 1: Potential impact on Dublin Airport IFPs due to presence of wind turbines in this chapter. Option A would result in a lower level of disturbance and would not introduce new impacts, or an impact of materially different magnitude. The offshore export cable routes will only have an effect on aviation if any of the construction structures (e.g., cranes) are > 90 m amsl in height. However, in accordance with the Project Description, it is not planned to use cranes, or any other offshore cable route infrastructure > 90 m amsl.
	Installation of WTGs	60 wind turbines with maximum tip height up to 314 m above LAT	
	Temporary infrastructure		
	Use of construction infrastructure (e.g., cranes) to install WTGs	Up to 314 m above LAT	
	Use of construction infrastructure (e.g. cranes) to install offshore cables	All structures > 90 m above mean sea level (amsl) in height	
Impact 2: Potential impact on low flying (including IRCG SAR helicopter operations) due to presence of obstacles (cranes,	Permanent infrastructure		The temporary disturbance relates to use of construction infrastructure (e.g., cranes) that could conceivably extend beyond the maximum turbine tip height during WTG installation. It should be noted however that, in accordance with the Project Description, it is not planned to use cranes, or any other lifting systems, that will extend above the maximum height of the WTGs.
	Installation of WTGs	60 wind turbines with maximum tip height up to 314 m above LAT	

Impact	Representative scenario details	Value	Notes / assumptions
stationary wind turbines, offshore substation structure OSS)	Temporary infrastructure		WTG Option B forms the representative scenario as this represents the greatest level of effect on aviation, and therefore Option B forms the presentational basis of the assessment for Impact 2: Potential impact on low flying (including IRCG SAR helicopter operations) due to presence of obstacles (cranes, stationary wind turbines, OSSs) in this chapter. Option A would result in a lower level of disturbance and would not introduce new impacts, or an impact of materially different magnitude. The offshore export cable routes will only have an effect on aviation if any of the construction structures (e.g., cranes) are > 90 m amsl in height. However, in accordance with the Project Description, it is not planned to use cranes, or any other offshore cable route infrastructure > 90 m amsl.
	Use of construction infrastructure (e.g., cranes) to install WTGs	Up to 314 m above LAT	
	Use of construction infrastructure (e.g. cranes) to install offshore cables	All structures > 90 m above mean sea level (amsl) in height	
Operations and maintenance			
Impact 1: Potential impact on Dublin Airport ATC radar due to presence of wind turbines.	Permanent infrastructure		Adverse effects on ATC radar are only possible if the wind turbine blades are moving; therefore, this impact is applicable to the operational phase only. ATC radars are primarily looking to identify moving targets; consequently, rotation of the wind turbine blades mimics the movements of real aircraft resulting in unwanted radar clutter which 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. WTG Option B forms the representative scenario as this represents the greatest level of effect on aviation, and therefore Option B forms the presentational basis of the assessment for Impact 1: Potential impact on Dublin Airport ATC radar due to presence of wind turbines in this chapter. Option A would result in a lower level of disturbance and would not introduce new impacts, or an impact of greater magnitude.
	Operation of WTGs	60 wind turbines with maximum tip height up to 314 m above LAT	

Impact	Representative scenario details	Value	Notes / assumptions
Impact 2: Potential impact on Met Eireann Dublin Airport meteorological radar due to presence of wind turbines.	Permanent infrastructure		Adverse effects on meteorological radar are only possible if the wind turbine blades are moving; therefore, this impact is applicable to the operational phase only. 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 WTGs can create significant types of interference to weather radar data; namely, blockage, reflectivity, multi-path scattering and clutter. WTG Option B forms the representative scenario as this represents the greatest level of effect on aviation, and therefore Option B forms the presentational basis of the assessment for Impact 2: Potential impact on Met Eireann Dublin Airport meteorological radar due to presence of wind turbines in this chapter. Option A would result in a lower level of disturbance and would not introduce new impacts, or an impact of greater magnitude.
	Operation of WTGs	60 wind turbines with maximum tip height up to 314 m above LAT	
Decommissioning			
Impact 1: Potential impact on Dublin Airport IFPs due to presence of wind turbines.	It is recognised that legislation and industry best practice change over time. However, for the purposes of the EIA, at the end of the operational lifetime of the CWP Project, it is assumed that all offshore infrastructure will be removed where practical to do so. In this regard, for the purposes of a representative scenario for decommissioning impacts, the following assumptions have been made: • The WTGs and OSS topsides shall be completely removed. • Following WTG and OSS topside decommissioning and removal, the monopile foundations will be cut below the seabed level, to a depth that will ensure the remaining foundation is unlikely to become exposed. This is likely to be approximately one metre below seabed, although the exact depth will depend upon the sea-bed conditions and site characteristics at the time of decommissioning. • All cables and associated cable protection in the offshore environment shall be wholly removed. It is likely that equipment similar to that which is used to install the cables may be used to reverse the burial process and expose them. Therefore, the area of seabed impacted during the removal of the cables is anticipated to be the same as the area impacted during the installation of the cables.		
Impact 2: Potential impact on low flying (including IRCG SAR helicopter operations) due to presence of obstacles (cranes, stationary wind turbines, offshore			

Impact	Representative scenario details	Value	Notes / assumptions
substation structure OSS)	• Generally, decommissioning is anticipated to be a reverse of the construction and installation process for the CWP Project and the assumptions around the number of vessel on site, and vessel round trips is therefore the same as described for the construction phase of the offshore components. Given the above it is anticipated that for the purposes of a representative scenario, the impacts will be no greater than those identified for the construction phase.		

Table 17-9 Limits of deviation – Aviation, military and radar construction phase impacts

Project component	Limit of deviation	Conclusion from Appendix 17.2
WTGs / OSSs	100 m from the centre point of each WTG and OSS location is proposed to allow for small adjustments to be made to the structure locations.	No potential for new or materially different effects
IACs / interconnector cables	100 m either side of the preferred alignment of each IAC and interconnector cable is proposed to allow for small adjustments to be made to the cable alignments.	No potential for new or materially different effects
Offshore export cables	250 m either side of the preferred alignment within the array site. The offshore export cable corridor (OECC)	No potential for new or materially different effects

17.9 Primary mitigation measures

74. Throughout the evolution of the CWP Project, measures have been adopted as part of the evolution of the project design and approach to construction, to avoid or otherwise reduce adverse impacts on the environment. These mitigation measures are referred to as 'primary mitigation'. They are an inherent part of the CWP Project and are effectively 'built in' to the impact assessment.

75. Primary mitigation measures relevant to the assessment of aviation, military and radar are set out in **Table 17-10**. Where additional mitigation measures are proposed, these are detailed in the impact assessment (**Section 17.10**). Additional mitigation includes measures that are not incorporated into the design of the CWP Project and require further activity to secure the required outcome of avoiding or reducing impact significance.

Table 17-10 Primary mitigation measures

Project element	Description
Lighting and Marking Plan (LMP)	A **Lighting and Marking Plan** (LMP) has been prepared to capture construction and O&M phase lighting requirements for the offshore infrastructure and demarcation of the offshore development area such as construction buoy requirements. The LMP includes details of: • Marking and lighting of the array site in agreement with Irish Lights and in line with IALA G1162 (IALA, 2021a); • Buoyed construction area around the array in agreement with Irish Lights; and • Specific requirements in terms of aviation lighting to be installed on the turbines. The LMP will be prepared in consultation with the IAA, DoD and IRCG. It will take into account DoD's requirement for WTGs to be observable to night vision equipment. The LMP will ensure appropriate lighting is in place to facilitate aeronautical safety. The LMP will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent. It will be a live document which will be updated and submitted to the relevant authority, prior to the start of construction.
Turbine layout	Positions of WTGs and OSSs have been informed by a wide range of site-specific data, including metocean data (e.g., wind speed and direction), geophysical and geotechnical survey data (e.g., bathymetry), environmental data (e.g., benthic surveys and archaeological assessment) and stakeholder consultation. Designing and optimising the layout of the WTGs has considered multiple constraints identified from analysis of these datasets, alongside the consideration of layout principles taken from relevant guidance on the design of OWFs. A summary of the key actions taken to avoid or otherwise reduce impacts is provided below: • The WTG layout options include Search and Rescue (SAR) access lanes to allow a SAR resource to fly on the same orientation continuously through the array site. This is provided

Project element	Description
	to minimise risks to surface vessels and / or SAR resource transiting through the array site. • Archaeological exclusion zones (AEZs) around known features of archaeological interest have been avoided. No works that impact the seabed will be undertaken within the extent of an AEZ during the construction, operational or decommissioning phases. • The locations of offshore infrastructure have been developed to avoid known sensitive ecological habitats, including areas with suitable conditions for *Sabellaria spinulosa* which can form reefs under some circumstances. While reefs were not identified during the characterisation surveys, as an ephemeral feature it will be necessary to validate the results in advance of construction. A pre-construction geophysical survey will therefore be undertaken to facilitate the micro-siting around sensitive habitats such as *Sabellaria spinulosa*. • The WTG layout options have been developed to avoid or minimise interaction with known areas of high fishing density, where possible. As avoidance is not always possible, the layouts have also been developed to increase the potential for coexistence. • A paleochannel (the remnants of a river or stream channel that flowed in the past) in the centre west of the array site has been avoided.
SAR helicopter operations	An Emergency Response and Cooperation Plan (ERCoP) will be in place for the CWP Project. The ERCoP will detail liaison with SAR resources including the IRCG to ensure suitable emergency response plans and procedures are in place. 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 offshore development area. This will ensure appropriate lighting is in place to facilitate aeronautical safety during SAR operations.
Aviation charts and publications	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. This will comply with OREDP (DCCAE, 2014), which requires the IAA to be notified of the construction and location of wind turbines.
Aviation charts and publications	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 object which is higher than 90 m in height is considered to have significance for the en-route operation of aircraft in Irish airspace.
Aviation charts and publications	During the operational phase, the operator of the CWP Project will issue, as necessary, requests to the IAA to submit Aeronautical Information Circulars (AIC) in the event of any failure of aviation lighting. Any light which fails shall be repaired or replaced as soon

Project element	Description
	as 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. This will comply with IAA ASAM No. 18 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.

17.10 Impact assessment

17.10.1 Construction phase

76. The potential environmental impacts arising from the construction phase of the CWP Project are listed in **Table 17-8** along with the parameters against which the construction phase impact has been assessed. A description of the potential effect on aviation, military and radar receptors caused by each identified impact is given below.

Impact 1: Potential impact on Dublin Airport IFPs due to presence of wind turbines.

77. The installation, and presence, of a wind farm within 25 NM of a civil airport can impact on that unit's IFPs. In particular, aircraft inbound to an airport fly on published routes and only down to the lowest altitude prescribed on the relevant procedure.

Receptor sensitivity

78. Within a 25 NM radius of an airport, the lowest altitude to which aircraft can safely descend is designed such that 1,000 feet (ft) vertical separation can be maintained from all terrain and obstacles (such as wind turbines); this is known as the MSA. Further descent below this altitude is not authorised until the aircraft is established on the final approach track (usually within 10 NM of the runway).

79. Although airport MSAs are published out to 25 NM, aviation regulations dictate that, in determining airport MSA, the elevation of terrain and obstacles should be surveyed out to 30 NM. However, in the case of the proposed development, the wind turbines will be approximately 24 NM to the southeast of Dublin Airport; consequently, only likely to affect the initial stages of aircraft approaches to the airport. The sensitivity of this receptor is therefore considered to be high.

Magnitude of impact

80. At the request of the IAA, the Applicant commissioned an IFP assessment from ASAP S.R.O (an EU-accredited procedure design company) to ascertain any potential impact on Dublin Airport's IFPs. The report can be found at **Appendix 17.3 Codling Wind Park Dublin Airport Special Aeronautical Study** and concluded that Dublin Airport's IFPs will not be affected by the proposed development. The magnitude of impact of this receptor is therefore considered to be negligible.

Significance of the effect

81. The impact is predicted to be of local spatial extent, short- to medium-term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The sensitivity of the impact on Dublin Airport's IFPs is therefore considered to be high and, as a result of the IFP assessment carried out by ASAP S.R.O. (**Appendix 17.3 Codling Wind Park Dublin Airport Special Aeronautical Study)**, the magnitude of the impact is assessed as negligible. Therefore (as per the matrix in **Table 17-5**), an effect of significance of **negligible** is predicted, which is not significant in EIA terms.

Residual effect

82. No further mitigation is required, therefore the significance of the residual effect is predicted to be **negligible**, which is not significant in EIA terms.

Impact 2: Potential impact on low flying (including IRCG SAR helicopter operations) due to presence of obstacles (cranes, stationary wind turbines, OSSs)

83. The installation and presence of wind turbines pose physical obstructions to aviation operations carried out in the vicinity of wind farms. Wind turbines 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 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 are not expected to exceed the maximum blade tip height of the WTGs i.e., 314 m) above the sea surface.

Receptor sensitivity

84. 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. The presence of construction infrastructure (e.g., vessels with high cranes, will be alerted to pilots under the Notice to Airmen (NOTAM) system (see **Table 17-10**). 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 as set out in **Table 17-10**.

85. In terms of potential impact on DoD aviation operations, the CWP project would have no significant impact on Air Corps operations, provided the turbines are marked and lit and observable also to night vision equipment.

86. In terms of SAR operations, the CWP project has been designed to incorporate at lines of orientation. There is no current active guidance on layout design, however key stakeholders have indicated that the principles within MGN 654 (MCA, 2021) should be considered, noting that the same principles are included in the draft DoT Guidance. In line with this guidance the WTGs and OSS in both Layouts A and B are arranged in a broad grid pattern and are spaced allowing for SAR access lanes of at least 500 m in width in two lines of orientation. The layouts and SAR access lanes were shared with the IRCG via a consultation meeting in November 2023 (see **Chapter 16 Shipping and Navigation**. It is noted that application of LoD to the OSS may mean that lanes adjacent to OSS locations do drop below 500 m (tip to tip), however in this instance the majority of the array site would still maintain

multiple lines of orientation, and as required under MGN 654 a full single line of orientation would remain.

87. IRCG are the provider of SAR helicopter operations in Ireland. Emergency response plans will be produced in discussion with relevant SAR bodies including the IRCG, and this will include cooperation procedures in relation to self-help resources. In this regard it is noted that on-site vessels associated with the construction of the CWP Project may be able to assist in an emergency incident in liaison with IRCG and as required under SOLAS obligations.

88. Therefore, the most likely consequences in the event of an emergency response incident in the region is that responders are able to assist without any limitations on capability. Consultation will also be carried out with IRCG on their requirements in relation to SAR lighting and marking and consultation will continue as turbine layout plans are refined prior to construction. The sensitivity of this receptor is therefore considered to be high.

Magnitude of impact

89. Aircraft operating at low levels are required to set a Minimum Safe Altitude (MSA) which 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. The anticipated maximum tip height of the proposed turbines is 314 m (1,031 ft) amsl. Therefore, the MSA in the area of the proposed development will need to be 2,200 ft (1,031 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.

90. As detailed in **Table 17-10**, potential impacts to low flying aircraft (including SAR helicopters) operating in the vicinity of the proposed development will be managed through the agreement of a LMP 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). The magnitude of impact of this receptor is therefore considered to be negligible.

Significance of the effect

91. The impact is predicted to be of local spatial extent, short to medium term duration, intermittent and low reversibility. It is predicted that the impact will affect the receptor directly. The sensitivity of the impact on low flying is therefore considered to be high and the magnitude of the impact is assessed as negligible. Therefore (as per the matrix in **Table 17-5**), an effect significance of **negligible** is predicted, which is not significant in EIA terms.

92. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation measures described in **Section 17.9**.

Residual effect

93. With the adoption of the primary mitigation measures the magnitude of effect will be low. The significance of the residual effect is therefore predicted to be **negligible**, which is not significant in EIA terms.

17.10.2 Operation and maintenance

94. The potential environmental impacts arising from the operation and maintenance of the CWP Project are listed in **Table 17-8** along with the parameters against which the operation and maintenance phase impact has been assessed. A description of the potential effect on aviation, military and radar receptors caused by each identified impact is given below.

Impact 1: Potential impact on Dublin Airport ATC radar due to presence of wind turbines.

95. It should be noted that adverse effect on PSRs is only possible if the wind turbine blades are moving, therefore this impact is applicable to the operation and maintenance phase only.

96. Wind turbines 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 the 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.

Receptor sensitivity

97. 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. The sensitivity of this receptor is therefore considered to be high.

Magnitude of impact

98. Dublin Airport uses PSR to support their provision of navigational services to aircraft operating in / out of the airport and to aircraft transiting the Shannon FIR. Air traffic controllers are responsible for maintaining typically 5 NM lateral separation between aircraft. Where line of sight to an ATC radar exists, wind turbines may appear as genuine aircraft targets and could mask genuine aircraft responses. 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.

99. In order to determine the potential impact on Dublin Airport ATC radar operations, the Applicant has collaborated fully with the Phase 1 Working Group and also held bi-lateral discussions with IAA who indicated that there is no impediment to coexistence between the proposed development and aviation operations at Dublin Airport, inclusive of ATC radar operations. The magnitude of impact of this receptor is therefore considered to be negligible.

Significance of effect

100. The impact is predicted to be of regional spatial extent, long-term duration and not reversible. It is predicted that the impact will affect the receptor directly. The sensitivity of the aviation radar receptor is considered to be high and the magnitude the of impact is assessed as negligible. Therefore (as per the matrix in **Table 17-5**), an effect of significance of **negligible** is predicted, which is not significant in EIA terms.

101. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation measures described in **Section 17.9**.

Residual effect

102. As no impediment to Dublin Airport ATC radar operations is anticipated, the magnitude of effect will be negligible. The significance of the residual effect is therefore predicted to be **negligible**, which is not significant in EIA terms.

Impact 2: Potential impact on Met Eireann Dublin Airport meteorological radar due to presence of wind turbines.

103. It should be noted that adverse effect on met radars is only possible if the wind turbine blades are moving, therefore this impact is applicable to the operation and maintenance phase only.

Receptor sensitivity

104. The presence of WTGs 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 WTGs in radar-line-of-sight (RLOS) can create significant types of interference to weather radar data; namely, blockage, reflectivity, multi-path scattering and clutter. The sensitivity of this receptor is therefore considered to be high.

Magnitude of impact

105. WTGs need to be in RLOS and in the beam of the radar at its lowest elevation to have an impact on meteorological radars. The meteorological radar at Dublin Airport is located 42 km from the nearest WTG, which is at the extremity of the 20–45 km range identified in WMO-No.8 as a low impact zone. WMO-No.8 also advises that in the case of WTGs within the low impact zone, meteorological data should still be visible to the radar and consequently should create a relatively minor impact on meteorological operations; outside 45 km, effects of WTGs on meteorological radar are not expected. In the case of the proposed development, a maximum of 6 WTGs (from WTG Layout Option A or Option B) will be within 45 km of the radar so any adverse effects will be minimal. It is considered highly unlikely that the CWP Project will have any meaningful interaction with the meteorological radar at Dublin Airport. The magnitude of impact of this receptor is therefore considered to be low.

Significance of effect

106. The impact is predicted to be of regional spatial extent, long-term duration and not reversible. It is predicted that the impact will affect the receptor directly. The sensitivity of the meteorological radar receptor is considered to be high and the magnitude the of impact is assessed as low. Therefore (as per the matrix in **Table 17-5**), an effect of significance of **minor** is predicted, which is not significant in EIA terms.

107. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation measures described in **Section 17.9**.

Residual effect

108. As only a minimal effect on the meteorological radar at Dublin Airport is anticipated, the magnitude of effect will be low. The significance of the residual effect is therefore predicted to be **minor**, which is not significant in EIA terms.

17.10.3 Decommissioning phase

109. The effects of decommissioning activities are expected to be the same as, or similar to, the effects from the construction phase. Any impact during decommissioning is related to presence of obstacles to aircraft flying at low level, or potential impact on airport safeguarding areas (IFPs). These impacts have already been considered and mitigated prior to the construction phase, and mitigation measures will remain in place throughout the life of the wind farm. During decommissioning, there is no additional impact and as such the conclusion drawn for Impact 1: Potential impact on Dublin Airport IFPs due to presence of wind turbines (**negligible**) and Impact 2: Potential impact on low flying (including IRCG SAR helicopter operations) due to presence of wind turbines (**negligible**) are directly applied to decommissioning with the significance remaining the same.

17.11 Cumulative impacts

110. A fundamental component of the EIA is to consider and assess the potential for cumulative effects of the CWP Project with other projects, plans and activities (hereafter referred to as 'other development').

111. **Appendix 17.1 Cumulative Effects Assessment** presents the findings of the Cumulative Effects Assessment (CEA) for aviation, military and radar, which considers the residual effects presented in **Section 17.10,** alongside the potential effects of other proposed and reasonably foreseeable other development.

112. In summary, the CEA for aviation, military and radar identified that no specific cumulative effects on aviation stakeholders are expected.

17.12 Transboundary impacts

113. In terms of the impacts on aviation, military and radar receptors, impacts will be localised to within the footprint of the Generating Station. Furthermore, the Applicant engaged with the Isle of Man, MoD and NATS (**Table 17-1**) on transboundary issues and no concerns were raised. Consequently, it is concluded that there is no potential for transboundary impacts and resultant effects to occur.

17.13 Inter-relationships

114. The inter-related effects assessment considers the potential for all relevant effects across multiple topics to interact, spatially and temporally, to create inter-related effects on a receptor group. This includes incorporating the findings of the individual assessment chapters to describe potential additional effects that may be of greater significance when compared to individual effects acting on a receptor group.

115. The term 'receptor group' is used to highlight the fact that the proposed approach to the inter-relationships assessment has assessed every individual receptor considered in this chapter, but instead focuses on groups of receptors that may be sensitive to inter-related effects.

116. **Chapter 5 EIA Methodology** provides a matrix to show at a broad level where across the EIAR interactions between effects on different receptor groups have been identified.

117. The potential inter-related effects that could arise in relation to aviation, military and radar are presented in **Table 17-11** Inter-related effects (phase) assessment for aviation, military and radar.

Table 17-11 Inter-related effects (phase) assessment for aviation, military and radar

Impact / receptor	Related chapter	Phase assessment
Potential exists for spatial and temporal interactions between direct impacts to aviation, military and radar in respect of the lighting and marking requirements for the proposed development's WTGs. As aviation lighting and marking requirements differ from those of maritime operators, it has been necessary to interact with the **Chapter 16 Shipping and Navigation** assessment in order to ensure that the requirements of both aviation and maritime operators are taken into account. As a result, a joint LMP has been developed which outlines the lighting and marking mitigation measures which are designed to avoid confliction between aviation and maritime operators. No other inter-relationships exist with the potential to alter or introduce significant effects.		

17.14 Potential monitoring requirements

118. Monitoring requirements for the CWP Project will be described in the **In Principle Project Environmental Monitoring Plan (IPPEMP)** submitted alongside the EIAR and further developed and agreed with stakeholders prior to construction.

119. The assessment of impacts on aviation, military and radar as a result of the construction, O&M, and decommissioning phases of the CWP Project are predicted to be not significant in EIA terms. Based on the predicted impacts it is concluded that no specific monitoring is required.

17.15 Impact assessment summary

120. This chapter of the EIAR has assessed the potential environmental impacts on aviation, military and radar from the construction, operation and maintenance, and decommissioning phases of the CWP Project. Where significant impacts have been identified, additional mitigation has been considered and incorporated into the assessment.

121. **Table 17-12** summarises the impact assessment undertaken and confirms the significance of any residual effects, following the application of additional mitigation.

Table 17-12 Summary of potential impacts and residual effects

Potential impact	Receptor	Receptor sensitivity	Magnitude of impact	Significance of effect	Additional mitigation	Residual effect
Construction						
Impact 1: Potential impact on Dublin Airport IFPs due to presence of wind turbines.	Dublin Airport IFPs	High	Negligible	Negligible (not significant)	Not required	Negligible (not significant)
Impact 2*:* Physical obstructions to low flying aircraft (including IRCG SAR helicopter operations) due to presence of obstacles (cranes, stationary wind turbines, offshore substation structure (OSS))	Low flying aircraft (including IRCG SAR helicopter operations)	High	Negligible	Negligible (not significant)	Not required	Negligible (not significant)
Operation and maintenance						
Impact 1: Potential impact on Dublin Airport ATC radar due to presence of wind turbines	Dublin Airport ATC radar	High	Negligible	Negligible (not significant)	Not required	Negligible (not significant)

Potential impact	Receptor	Receptor sensitivity	Magnitude of impact	Significance of effect	Additional mitigation	Residual effect
Impact 2: Potential impact on Met Eireann Dublin Airport meteorological radar due to presence of wind turbines	Met Eireann Dublin Airport meteorological radar	High	Low	Minor (not significant)	Not required	Minor (not significant)
Decommissioning						
The effects of decommissioning activities are expected to be the same as or similar to the effects from the construction phase.						
Impact 1: Potential impact on Dublin Airport IFPs due to presence of wind turbines	Dublin Airport IFPs	High	Negligible	Negligible (not significant)	Not required	Negligible (not significant)
Impact 2: Physical obstructions to low flying aircraft (including IRCG SAR helicopter operations) due to presence of obstacles (cranes, stationary wind turbines, offshore substation structure (OSS))	Low flying aircraft (including IRCG SAR helicopter operations)	High	Negligible	Negligible (not significant)	Not required	Negligible (not significant)

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