LLŶR FLOATING OFFSHORE WIND PROJECT

Llŷr 1 Floating Offshore Wind Farm

Environmental Statement

Volume 3: Chapter 27 - Aviation and Radar

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FLOVENTIS ENERGY

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Acronyms and abbreviations

Acronym or abbreviation	Definition	Acronym or abbreviation	Definition
ACOMS	Airspace Coordination and Obstacle Management Service	km	Kilometre
AD	Air Defence	LARS	Lower Airspace Radar Service
ADR	Air Defence Range	LMMP	Lighting and Marking Management Plan
AIP	Aeronautical Information Publication	LOS	Line-of-Sight
AMS	Air Modernisation Strategy	m	Metre
ANO	Air Navigation Order	MCA	Maritime and Coastguard Agency
ASACS	Air Surveillance and Control System	MOD	Ministry of Defence
ATC	Air Traffic Control	nm	Nautical Miles
ATS	Air Traffic Services	NPS	National Policy Statement
ATSU	Air Traffic Service Unit	NSIP	Nationally Significant Infrastructure Project
CAA	Civil Aviation Authority	OES	Obstacle Evaluation Surfaces
CAP	Civil Aviation Publication	OFS	Obstacle Free Surfaces
CNS	Communications, Navigation, and Surveillance	OLS	Obstacle Limitation Surfaces
DIO	Defence Infrastructure Organisation	OS	Ordnance Survey
DTM	Digital Terrain Model	PAR	Precision Approach Radar
FIR	Flight Information Region	PDA	Project Development Area
FIS	Flight Information Services	PSR	Primary Surveillance Radar
FL	Flight Level	RAF	Royal Air Force
ft	Feet	SAR	Search and Rescue
ICAO	International Civil Aviation Organization	VFR	Visual Flight Rules
IFP	Instrument Flight Procedure		
IFR	Instrument Flight Rules		

Glossary of project terms

Term	Definition
The Applicant	The developer of the Project, Llŷr Floating Wind Limited.
Array	All wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure within the Array Area, as defined, when considered collectively, excluding the offshore export cable(s).
Array Area	The area within which the wind turbine generators, inter array cables, mooring lines, floating sub-structures and supporting subsea infrastructure will be located.
Floventis Energy	A joint venture company between Cierco Ltd and SBM Offshore Ltd of which Llŷr Floating Wind Limited is a wholly owned subsidiary.
Landfall	The location where the offshore export cable(s) from the Array Area, as defined, are brought onshore and connected to the onshore export cables (as defined) via the transition joint bays (TJB).
Llŷr 1	The proposed Project, for which the Applicant is applying for Section 36 and Marine Licence consents. Including all offshore and onshore infrastructure and activities, and all project phases.
Marine Licence	A licence required under the Marine and Coastal Access Act 2009 for marine works which is administered by Natural Resources Wales (NRW) Marine Licensing Team (MLT) on behalf of the Welsh Ministers.
Offshore Development Area	The footprint of the offshore infrastructure and associated temporary works, comprised of the Array Area and the Offshore Export Cable Corridor, as defined, that forms the offshore boundary for the S36 Consent and Marine Licence application.
Offshore Export Cable	The cable(s) that transmit electricity produced by the WTGs to landfall.
Offshore Export Cable Corridor (OfECC)	The area within which the offshore export cable circuit(s) will be located, from the Array Area to the Landfall.
Onshore Development Area	The footprint of the onshore infrastructure and associated temporary works, comprised of the Onshore Export Cable Corridor and the Onshore Substation, as defined, and including new access routes and visibility splays, that forms the onshore boundary for the planning application.
Onshore Export Cable(s)	The cable(s) that transmit electricity from the landfall to the onshore substation.
Onshore Export Cable Corridor (OnECC)	The area within which the onshore export cable circuit(s) will be located.
Onshore Substation	Located within the Onshore Development Area, converts high voltage generated electricity into low voltage electricity that can be used for the grid and domestic consumption.
proposed Project	All aspects of the Llŷr 1 development (i.e. the onshore and offshore components).
Project Design Envelope (PDE)	The approach used to describe the design of the proposed Project to be used in assessments because it is not possible to finalise the specifics of the project design. Further site investigation which will inform the final design of the proposed Project.

Section 36 consent	Consent to construct and operate an offshore generating station, under Section 36 (S.36) of the Electricity Act 1989. This includes deemed planning permission for onshore works.
Radar clutter	Unwanted returns from objects such as wind turbines, animals/insects, and rain that appear on the radar display.
Radar blanking	Radar blanking is a solution for unwanted radar returns (clutter). A zone is defined around the source of reflections, in this case the wind farm, within which radar returns are suppressed.

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27. AVIATION AND RADAR

27.1 Introduction

1. Llŷr Floating Wind Limited (hereafter the Applicant) is proposing to develop the Llŷr 1 Floating Offshore Wind Farm (hereafter referred to as the proposed Project), located approximately 35 km off the coast of Pembrokeshire in the Celtic Sea.

2. The proposed Project is a test and demonstration wind farm development, comprising up to 10 Wind Turbine Generators (WTGs). The proposed Project will make landfall at Freshwater West before connecting into Pembroke Dock power station and the national grid network.

3. The Applicant is seeking a Section 36 consent and Marine Licence for Llŷr 1, and this chapter forms part of the Environmental Statement (ES) which is submitted in support of those consent applications. This chapter describes the potential impacts and effects of the proposed Project on aviation and radar infrastructure during the construction, operation and maintenance and decommissioning phases, and includes mitigation and good practice measures to reduce the impacts of the proposed Project on aviation and radar infrastructure.

4. **Section 27.10** of this ES chapter provides a summary of the impact assessment undertaken and any residual significant effects on aviation and radar infrastructure following consideration of any mitigation measures.

5. Additional information to support the assessment includes **Appendix 27A: Aviation and Radar Technical Study**.

6. The assessment has been undertaken by Pager Power Limited. Further details of the proposed Project Team's competency are provided in **Volume 6** (**Appendix 1A: Statement of Competence**).

27.2 Legislation, Policy and Guidance

7. The following sections identify specific legislation, policy and guidance that is applicable to the assessment of aviation and radar. Further detail on the wider legislation, policy and guidance relevant to this ES is provided in **Chapter 02: Regulatory and Planning Policy Context**.

27.2.1. National Planning Policy

8. National Policy Statements (NPS) on Energy have been designated by the UK government to guide decision making on Nationally Significant Infrastructure Projects (NSIPs) consented under the Planning Act 2008. Given that the NPSs only applies to offshore wind projects that exceed 350 MW in capacity, they would not directly guide decision making on the proposed Project. However, because they were written to guide decision making on offshore wind projects, they are considered relevant as material considerations. The relevant NPSs for aviation and radar are summarised in **Table 27-1.**

Table 27-1. A summary of national planning policy relevant to aviation and radar

Summary of policy	How and where it is considered in the chapter
Paragraph 5.5.37 of EN-1 identifies that the potential effects on civil or military Communications, Navigation, and Surveillance (CNS), meteorological radars and/or other defence assets should be set out in the ES	The impact upon civil and military radar, meteorological radar, and other defence assets have been assessed throughout this chapter - relevant sections include **Sections 27.6** and **27.8**
Paragraph 5.5.38 of EN-1 identifies that Air Traffic Control (ATC) and non-cooperative surveillance	The most common form of non-cooperative surveillance includes Primary

Summary of policy	How and where it is considered in the chapter
should be included in the assessment of aviation and radar	Surveillance (PSR) and Air Surveillance and Control System (ASACS). Both radar systems have been assessed in this chapter – see **Section 27.8**
Paragraph 5.5.39 of EN-1 states that consultation should be undertaken with the Ministry of Defence (MOD), Met Office, Civil Aviation Authority (CAA), NATS and any aerodrome – licensed or otherwise – likely to be affected	Consultation has been undertaken with the MOD, NATS, Cornwall Airport Newquay and the Irish Aviation Authority (IAA) as they were likely to be affected – see **Section 27.3** Consultation with the CAA has not been undertaken at this stage and will be undertaken post consent to discuss aviation lighting – further explanation is provided in **Section 27.3**
Paragraph 5.5.40 of EN-1 states that the assessment should include the operation of CNS infrastructure, flight patterns (both civil and military), generation of weather warnings and forecasts, other defence assets (including radar) and aerodrome operational procedures	All infrastructure and operations mentioned in paragraph 5.5.40 of EN-1 are included in the search of infrastructure using the Study Areas identified in **Section 27.4** Infrastructure and operations within the relevant Study Areas have then been considered throughout the chapter - Relevant sections include **Sections 27.6** and **27.8**
Paragraph 5.5.40 of EN-1 states that cumulative effects with other relevant projects in relation to aviation, meteorological and defence should be included in the ES	Cumulative effects considering surrounding offshore wind farms have been assessed in **Section 27.11**
Paragraph 5.5.43 of EN-1 states that the Applicant should include appropriate mitigation measures as an integral part of the proposed development	Mitigation measures have been considered and in this chapter and will be implemented by the Applicant. Mitigation measures are set out in **Sections 27.7** and **27.9**
Paragraph 2.8.40 of EN-3 states that the Applicant needs to consider the impacts on civil and military radar and other aviation and defence interests (as per Section 5.5 of EN-1)	The impacts on civil and military radar have been assessed in **Section 27.8** of the chapter

27.2.2. Regional Planning Policy

9. No regional planning policy in relation to aviation and radar has been identified.

27.2.3. Local Planning Policy

10. No local planning policy in relation to aviation and radar has been identified.

27.2.4. Guidance

11. Guidance in relation to aviation and radar is dictated primarily by the Civil Aviation Publications (CAP) produced by the CAA. There is also further policy provided by the International Civil Aviation Organization (ICAO), the MOD, NATS (formerly National Air Traffic Services), and the Maritime and Coastguard Agency (MCA). Specific document guidance documents include:

- ICAO (2014), Procedures for Air Navigation Services, Aircraft Operations, Volume II Construction of Visual and Instrument Flight Procedures, Sixth Edition;
- CAA (2016), CAP 764: CAA Policy and Guidelines on Wind Turbines – Edition 6;
- CAA (2019), CAP 670: Air Traffic Services Safety Requirements – Edition 3;
- CAA (2020), CAP 738: Safeguarding of Aerodromes – Edition 3;
- CAA (2022), CAP 168: Licensing of Aerodromes – Edition 12;
- CAA (2021), CAP 393: Regulations made under powers in the Civil Aviation Act 1982 and the Air Navigation Order 2016 – Edition 6;
- CAA (2023), CAP 1711: Airspace Modernisation Strategy 2023–2040 Part 1: Strategic objectives and enablers – Edition 2;
- NATS Aeronaucial Information Publication (AIP) [digital resource, various publication dates] ;
- MCA (2021), Offshore Renewable Energy Installations: Requirements, guidance and operational considerations for SAR and Emergency Response – Version 3.

27.3 Stakeholder Engagement and Consultation

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

13. Stakeholders for the proposed Project include statutory consultees, landowners, local communities and other sea users. In addition to the statutory consultation process, there has been ongoing engagement with statutory and non-statutory consultees to steer the development of the proposed Project and this is detailed in **Table 27-2.**

27.3.5. Summary of Stakeholder Consultations

Table 27-2. Summary of the key issues raised by consultees and how each issue was addressed

Consultee	Consultation type and date	Comment raised	How issue has been addressed and location of response in chapter
Scoping			
NRW	Scoping response July 2022	Aviation lighting is likely to be required on some/all the wind turbine generators because several Dark Sky Discovery Sites lie within the Study Area	Aviation lighting will be implemented as an additional mitigation measure – **Section 27.9**.
Ministry of Defence	Email correspondence January – March 2023	Requirement for aviation lighting and marking on aeronautical charts.	The Applicant will implement appropriate aviation lighting and will ensure the proposed

Consultee	Consultation type and date	Comment raised	How issue has been addressed and location of response in chapter
		Oil & Gas blocks highly surveyed routes; however, these are not relevant to radar and so have not been discussed further in this chapter	Project is marked on aeronautical charts. The Llŷr 2 array area was removed from the proposed Project.
NATS	Email correspondence January – February 2023	Potential impacts upon Burrington PSR	Burrington PSR has been assessed within **Section 27.8**.
Pre-application			
Ministry of Defence	Email correspondence July 2023 – Ongoing	Updated assessment requested due to updated Array Area and WTG dimensions. Awaiting response from MOD	Potential impacts upon MOD aviation and radar infrastructure have been assessed in **Section 27.8**.
NATS	Email correspondence July 2023 – Ongoing	Significant operational impact identified for Burrington PSR Agreement to be established to implement mitigation measures in line with NATS guidance	Mitigation measures are being implemented and are outlined in **Section 27.9**.
IAA	Email correspondence February – March 2024	Based on a review of the materials provided in connection with the proposed Project and the advised location, the IAA has no specific observations	Transboundary effects are considered in **Section 27.13**.
Cornwall Airport Newquay	Email correspondence February 2024 – Ongoing	Impacts upon the airport radar for aircraft flying in the vicinity of the proposed Project	Potential impacts upon the Cornwall Airport Newquay radar have been assessed in **Section 27.8**.

14. Consultation with additional airports such as Swansea, Cardiff, and Bristol has been scoped out because they are located outside the Study Areas identified in **Section 27.4**.

15. Consultation with the Civil Aviation Authority (CAA) has been scoped out at this stage because the CAA is the regulator of the UK's airspace who do not provide pre-planning safeguarding services other than to mediate disagreements between aviation stakeholders. The CAA does decide on airspace changes, which are not proposed as part of the proposed Project, and appropriate aviation lighting, which is covered further in **Section 27.7**.

16. Consultation with the Maritime and Coastguard Agency, which has relevance to this chapter, was undertaken under a separate topic. The consultation with the MCA and assessment for Shipping and Navigation receptors is outlined in **Chapter 25: Shipping and Navigation**.

27.4 Approach to Assessment

27.4.1. Assessment Methodology

17. **Chapter 05: EIA Approach and Methodology** provides a summary of the general impact assessment methodology applied in this ES. The following sections provide further detail on the specific methodology used to assess the potential impacts on aviation and radar.

18. The approach to the assessment of cumulative impacts, transboundary impacts and interrelated effects is provided in **Sections 27.11, 27.12** and **27.13**.

19. The significance of potential effects has been evaluated using a systematic approach together with the expert judgement of the specialist consultant. The systematic approach is based upon the identification of the importance/value of receptors and their sensitivity to the proposed Project together with the predicted magnitude of the potential impact.

20. The terms used to define receptor sensitivity and magnitude of impact are based on those outlined in **Chapter 05: EIA Approach and Methodology**.

27.4.2. Significance Criteria

Magnitude of Impact

21. The scale or magnitude of potential impacts (both beneficial and adverse) is determined by a combination of three criteria: scale of change, spatial extent of change and duration of change, as outlined in **Chapter 05: EIA Approach and Methodology**, **Section 5.4.9**.

22. In the context of aviation and radar, all potential impacts are classed as adverse and therefore beneficial impacts are not mentioned further in this chapter.

23. The criteria for defining magnitude of impact for the purpose of the assessment on aviation and radar are provided in **Table 27-3**.

Table 27-3. A summary of the magnitude criteria that are associated to specific impacts

Magnitude Criteria	Definition
Large	The impact occurs over a large spatial extent resulting in widespread, long-term, or permanent changes in baseline conditions or affects a large proportion of a receptor population. The impact is very likely to occur and/or will occur at a high frequency or intensity. **Adverse:** Loss of resource and / or quality and integrity of resource; severe damage to key characteristics, features or elements
Medium	The impact occurs over a medium spatial extent resulting in medium-term, or partial changes in baseline conditions or partially affects a proportion of a receptor population. The impact is likely to occur and/or will occur at a medium frequency or intensity. **Adverse:** Loss of resource, but not adversely affecting the integrity; partial loss of / damage to key characteristics, features or elements
Small	The impact occurs over a small spatial extent resulting in short-term, or small changes in baseline conditions or partially affects a small proportion of a receptor population. The impact has a low likelihood of occurring and/or will occur at a low frequency or intensity.

Magnitude Criteria	Definition
	Adverse: Some measurable change in attributes, quality, minor loss of, or alteration to, one or more key characteristics, features or elements.
Negligible	The impact occurs over a minor spatial extent resulting in very short-term, or minor changes in baseline conditions or partially affects a very small proportion of a receptor population. The impact has a very low likelihood of occurring and/or will occur at a very low frequency or intensity. **Adverse:** Very minor loss of detrimental alteration to one or more characteristics, features or elements.

Sensitivity of Receptor

24. Receptor sensitivity is defined as the degree to which a receptor would be affected by an impact. The sensitivity of the receptor is characterised by three factors: vulnerability, recoverability and importance, as outlined in **Chapter 05: EIA Approach and Methodology**, **Section 5.4.10.**

25. The criteria for defining receptor sensitivity for the purpose of the assessment on aviation and radar are provided in **Table 27-4.**

Table 27-4. A summary of the criteria determining a receptor's sensitivity

Receptor Sensitivity Criteria	Definitions
Very High	Very high importance and/or rarity, internationally important receptor with little or no ability to absorb change without fundamentally altering its character. Limited potential for substitution.
High	High importance and/or rarity, nationally important, limited ability to absorb change and limited potential for substitution.
Medium	Medium or high importance and/or rarity, regional scale, limited potential for substitution, with a medium ability to absorb change.
Low	Low or medium importance and/or rarity, local scale, with some ability to absorb change.
Negligible	Very low importance and/or rarity, local scale, with good ability to absorb change.

Significance of Effect

26. As set out in **Chapter 05: EIA Approach and Methodology**, an Impact Assessment Matrix (IAM) is used to determine the significance of effect, which is a function of the sensitivity of the receptor and the magnitude of the impact, as shown in **Table 27-5.**

27. The matrix provides a framework for the consistent and transparent assessment of predicted effects across all receptor topics, however, it is important to note that the IAM acts as a guide and that assessments also allow for the application of expert judgement.

Table 27-5. Significance matrix

		Value / Sensitivity				
		Very High	High	Medium	Low	Negligible
Magnitude	Large	Major adverse	Major adverse	Major adverse	Moderate adverse	Minor adverse
	Medium	Major adverse	Major adverse	Moderate adverse	Minor adverse	Negligible
	Small	Major adverse	Moderate adverse	Minor adverse	Minor adverse	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

28. The IAM provides levels of effect significance ranging from major to negligible. Assignment of significance is carried out with consideration of embedded mitigation measures relevant to aviation and radar. Embedded mitigation measures (including project design measures and best practice) are presented within **Section 27.7**. Details on additional mitigation measures and associated definitions can be found in **Section 27.9**. For the purposes of this assessment, Moderate and Major levels of significance are defined as significant, and where relevant additional mitigation measures may be required, whilst Negligible or Minor impacts are defined as not significant.

Table 27-6. A summary of the definitions of each significant of effect criteria

Significance Category	Definitions	Significant / Not Significant Effect
Major	A large and detrimental change to a valuable / sensitive receptor; likely or apparent exceeding of accepted (often legal) threshold. These effects may represent key factors in the decision-making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.	Significant
Moderate	A medium scale change which, although not beyond an acceptable threshold, is still considered to be generally unacceptable. Likely to be in breach of planning policy rather than a legal statute. These effects, if adverse, are likely to be important at a local scale and on their own could have a material influence on decision making.	Significant (unless otherwise specified)
Minor	A small change that, whilst adverse, does not exceed legal or guideline standards. Unlikely to breach planning policy. These effects may be raised as local issues and may be of relevance in the detailed design of a project but are unlikely to be critical in the decision-making process.	Not Significant
Negligible	A very small change that is so small and unimportant that it is considered acceptable to disregard.	Not Significant

Significance Category	Definitions	Significant / Not Significant Effect
	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error. These effects are unlikely to influence decision making irrespective of other effects.	

27.4.3. Study Areas

29. The Study Areas for the assessment of aviation and radar are based on those detailed in Chapter 4 of the CAP 764 document. The Study Areas applied for each infrastructure type are outlined in **Appendix 27A**.

30. It is not practical to plot all study areas listed in **Appendix 27A** and therefore circles at 50 km, 100 km, and 150 km have been presented in **Figure 27-1** for reference. The infrastructure identified in this chapter and **Appendix 27A** are also shown.

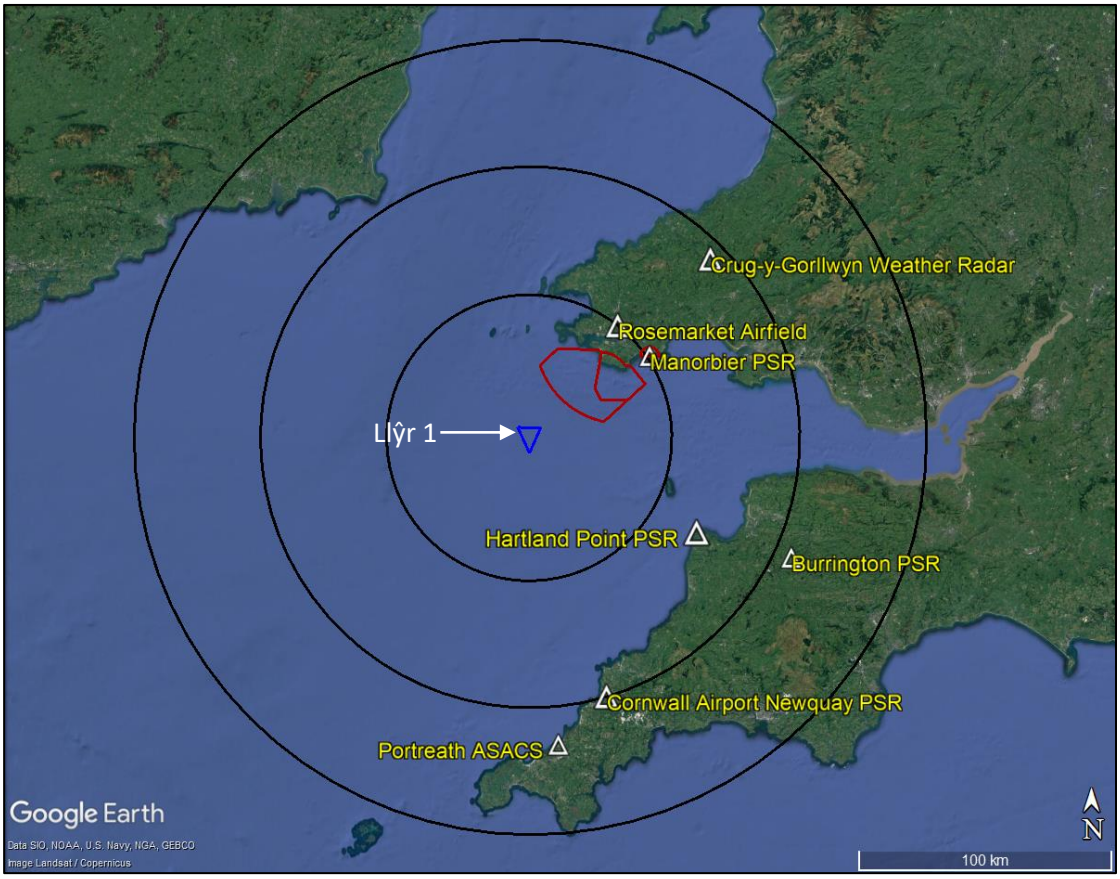

Figure 27-1. Identified infrastructure and nominal study areas

27.4.4. Data Sources

Site Specific Surveys

31. No specific site surveys were undertaken in relation to aviation and radar as it is not standard practice to do so. No site specific site surveys were requested by the relevant consultees/stakeholders.

Desk Study

32. A comprehensive desk-based review was undertaken to inform the baseline for aviation and radar. Key data sources used to inform the assessment are set out in **Table 27-7.**

Table 27-7. Summary of key desktop sources

Title	Source	Year	Brief description	Author
Pager Power's database of installations	The installations have been obtained from a variety of sources	2024	A continuously updated database of installations based on stakeholder consultation, field surveys and official publications	Pager Power
NATS Aeronautical Information Package	NATS website	2024	Online data source for information related to civil aerodromes, NATS services, and military low flying areas in the UK	NATS
Visual Flight Rules (VFR) aeronautical charts	Various vendors	2022	Physical aeronautical charts used by pilots to plan flights when flying using VFR	CAA
Ordnance Survey (OS) Terrain 50 Digital Terrain Model (DTM)	OS website	2013	Publicly available height dataset of contours with spot heights, breaklines, coastline, lakes, ridges and formlines for Great Britain	OS

27.5 Baseline

33. The following sections describe the baseline environment relating to aviation and radar.

27.5.1. Existing Baseline

Surrounding Airspace

34. The Array Area is in the London Flight Information Region (FIR), which covers England Wales. FIR are managed by a controlling authority that ensures air traffic services are provided to the aircraft flying within it. The CAA is the controlling authority of the London FIR and NATS provide Air Traffic Services (ATS) on behalf of the CAA in the region.

35. The Array Area is in Class G uncontrolled airspace up to Flight Level (FL) 195 (approx. 19.500ft). In class G airspace, aircraft may fly when and where they like, subject to a set of simple rules. Although there is no legal requirement to do so, many pilots notify ATC of their presence and intentions and pilots take full responsibility for their own safety.

36. ATC can provide pilots in Class G with Flight Information Services (FIS) to support their safe flying. An Alerting Service is also provided if necessary to notify appropriate organisations regarding aircraft in need of assistance (e.g., search and rescue).

37. The airspace from FL195 (approx. 19,500ft) to FL245 (approx. 24,500ft) above the Array Area is Class C controlled airspace. Both Instrument Flight Rules (IFR) and VFR flying is permitted in this airspace; however, pilots require clearance to enter and must comply with ATC instructions.

Radar Infrastructure

38. The radar installations that were identified in the existing baseline environment are presented in **Table 27-8.**

Table 27-8. Radar infrastructure in the existing baseline

Radar	Stakeholder	Distance from Array Area	Comments
Manorbier PSR	MOD	51.2 km	Military ATC radar at Air Defence Range (ADR) Manorbier used to ensure aircraft do not fly near the ADR danger area
Hartland Point PSR		72.6 km	Watchman radar located at Royal Air Force (RAF) Hartland Point on the north-western tip of the Devon coast, which is used to provide ATC for military aircraft
Cornwall Airport Newquay PSR	Cornwall Airport Newquay	100 km	Civil radar operated by Cornwall Airport Newquay to provide ATC services for aircraft in the airport's airspace and Lower Airspace Radar Services (LARS) to aircraft below FL100 around the Array Area
Burrington PSR	NATS En-Route	110.5 km	A long range en-route radar located in North Devon providing ATS for civil aircraft outside the proximity of an airport
Portreath ASACS	MOD	114.7 km	An air defence radar located on the north coast of Cornwall, which provides information on aircraft flying in the UK Air Defence Region

Civil and Military Aerodromes

39. The closest civil (unlicensed, licensed, or International airport) or military aerodrome to the Array Area is Rosemarket Airfield. The airfield is in Milford Haven and approximately 50 km northeast of the Array Area. Larger airports such as Swansea, Cardiff, and Bristol are located approximately 95 km, 142 km, and 194 km from the Array Area, respectively.

40. The airfield and the larger airports mentioned in the previous paragraph are outside all Study Areas associated with civil and military aerodromes and therefore all other aerodromes will also be outside the relevant Study Areas. Civil and military aerodromes have therefore been scoped out of this assessment.

Military Low Flying

41. Military low flying can take place throughout the UK. The MOD has published a map indicating areas within the UK where military low flying activities are the most likely to cause an objection (Defence Infrastructure Organisation [DIO], 2011). The map is colour coded as follows:

- Green – Area with no military low flying concerns;
- Blue – Low priority military low flying areas less likely to raise concerns;
- Amber – Regular military low flying area where mitigation may be necessary to resolve concerns;
- Red – High priority military low flying area likely to raise considerable and significant concerns.

42. The Array Area is located offshore and therefore is not within any of the areas defined above. However, military low flying operations can still take place out to sea.

Danger Areas

43. Danger Areas are established around areas where hazardous operations are likely to take place. These include, for example, military exercises involving live firing, parachute dropping, violent and unpredictable aircraft manoeuvres, or the use of unmanned aerial systems.

44. Three danger areas (D113A, D113B, and D115B) have been identified along the south coast of Wales. The closest danger, D113A, is located approximately 13.9 km to the northeast of the Array Area.

45. The locations of danger areas relative to the Array Area are presented in **Appendix 27A.**

Helicopter Operations

46. Helicopter routes are not formally established over the Array Area. Search and Rescue (SAR) helicopters are likely to operate around the southwest coast; however, there are no formally safeguarded helicopter main routes.

47. A Helicopter Service operates between Lundy and Hartland Point on Mondays and Fridays from the beginning of November until the end of March. The Lundy Helipad, the closest point of the route, is over 57 km from the Array Area and has therefore not been considered further.

Meteorological Radar

48. The closest meteorological radar to the Array Area is the Crug-Y-Gorllwyn weather radar station. The radar is in Cartmarthenshire, Wales and approximately 94 km to northeast of the Array Area and has been scoped out.

27.5.2. Future Baseline

Surrounding Airspace

49. The Secretary of State gave the CAA the function to prepare and maintain a co-ordinated strategy and plan for the use of all UK airspace for air navigation up to 2040, including for the modernisation of the use of such airspace. The CAA therefore published the Airspace Modernisation Strategy (AMS) (CAA, 2023) that set out the strategy for developing the UK's airspace.

50. The AMS will mean that the airspace surrounding the Array Area will change by 2040; however, the specific changes are yet to be known and aviation and radar stakeholders are understood to be safeguarding based on the current airspace for the foreseeable future.

Civil and Military Aerodromes

51. ICAO has proposed new Obstacle Limitation Surfaces (OLS) which are planned to be applicable from November 2028; the CAA has launched a consultation with UK aviation stakeholders so that they may relay their concerns to ICAO.

52. In the proposed new OLS, the surfaces are going to be categorised into:

- Obstacle Free Surfaces (OFS) – These Surfaces will generally not permit any breaches as it is deemed necessary to keep the airspace above them free of obstructions for the safe operations in the vicinity of the aerodrome;
- Obstacle Evaluation Surfaces (OES) – These surfaces are in place because obstructions which breach them have a potential to pose a risk to safe operations in the vicinity of the aerodrome.

53. Although the final OLS are subject to change, the maximum horizontal extents of the updated OLS are not predicted to significantly differ from the current OLS maximum horizontal extents.

The new OLS are therefore not predicted to affect the future baseline in the context of civil and military aerodromes.

27.6 Scope of the Assessment

54. An EIA Scoping Report for the proposed Project was submitted to NRW Marine Licensing Team (MLT) in April 2022. The Scoping Report was also shared with relevant consultees, inviting comment on the proposed approach adopted by the Applicant. A Scoping Opinion was provided to the Applicant by NRW MLT in July 2022. Based on the Scoping Opinion received and further consultation undertaken, potential impacts on aviation and radar scoped into the assessment are listed below in **Table 27-9.** Impacts scoped out of the assessment are listed in **Table 27-10.**

55. As set out in **Section 27.4.1,** this assessment considers the design parameters of the proposed Project which are predicted to result in the greatest environmental impact, known as the 'realistic worst case scenario'. The realistic worst case scenario represents, for any given receptor and potential impact on that receptor, various options in the Project Design Envelope (PDE) (as described in **Chapter 4: Description of the proposed Project**) that would result in the greatest potential for change to the receptor in question. Given that the realistic worst case scenario is based on the design option (or combination of options) that represents the greatest potential for change, confidence can be held that the development of any alternative options within the design parameters will give rise to effects no greater or worse than those included in this impact assessment.

56. Accordingly the design scenarios identified in **Table 27-9** have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group within the aviation and radar Study Areas. These scenarios have been selected from the details provided in **Chapter 04: Description of the proposed Project**.

Table 27-9. Design scenario considered for the assessment

Potential impact	Design scenario	Justification
Radar clutter	WTGs covering the extents of the Array Area and at the maximum tip height would result in the worst-case impacts for all aviation and radar infrastructure.	The reasonable worst case scenario presented is based on the tallest potential WTGs, the maximum number of WTGs, and the WTGs covering the maximum spatial spread of the Array Area. No other design scenario would result in increased aviation and radar impacts.
Civil and military aerodromes		
Physical obstruction		
Danger areas		
Meteorological radar		

27.6.1. Impacts scoped out of assessment

57. A number of impacts have been scoped out of the assessment for aviation and radar during EIA scoping. These impacts are outlined, together with the justification for scoping them out, in **Table 27-10.**

Table 27-10. Potential impacts scoped out the assessment for aviation and radar

Potential impact	Justification
Construction	
Radar clutter	The WTG blades will not be spinning during construction, removing the potential for effects to be experienced by these radar All impacts would also be of a similar nature to operation and maintenance impacts, but of a smaller scale and shorter duration
Civil and military aerodromes	All impacts would be of a similar nature to operation and maintenance impacts, but of a smaller scale and shorter duration
Physical obstruction	
Danger areas	
Meteorological radar	
Operation and maintenance	
Radar clutter upon Portreath ASACS	The WTGs are beyond the radar Line-of-Sight (LOS) and will therefore not be detected by the radar
Civil and military aerodromes	The Array Area is beyond 30 km from any shoreline and is therefore beyond all known physical safeguarding distances from all civil and military aerodromes
Danger areas	The Array Area is a significant distance from any danger areas such that no impacts are possible
Meteorological radar	The Array Area is significantly outside the range in which concerns are raised by the Met Office
Decommissioning	
Radar clutter	The WTG blades will not be spinning during decommissioning, removing the potential for effects to be experienced by these radar All impacts would also be of a similar nature to operation and maintenance impacts, but of a smaller scale and shorter duration
Civil and military aerodromes	All impacts would be of a similar nature to operation and maintenance impacts, but of a smaller scale and shorter duration
Physical obstruction	
Danger areas	
Meteorological radar	

27.6.2. Assessment Assumptions and Limitations

58. All analysis is desk-based, no site surveys have taken place. This does not significantly affect the certainty of the results because the information sources are reliable and have, where appropriate, been cross-checked using multiple sources.

27.7 Embedded Mitigation, Management Plans and Best Practice

59. As part of the project design process, a number of embedded mitigation measures (including management plans) have been proposed to reduce the potential for impacts on aviation and radar. This approach has been employed in order to demonstrate commitment to mitigation measures by including them in the design of the proposed Project and as such these measures have been considered within the assessment presented in **Section 27.8**. Assessment of

sensitivity, magnitude and therefore significance includes the implementation of these measures.

60. The embedded mitigation measures are presented in **Table 27-11.**

Table 27-11 Mitigation measures adopted as part of the proposed Project

Embedded Mitigation Measures, Management Plans and Best Practice	Justification
Design Embedded Measures	
WTGs will be fitted with medium intensity red aviation lighting simultaneously flashing Morse Code Letter "W"	To comply with CAP 764 (, 2016) and *Offshore Renewable Energy Installations: Requirements, guidance and operational considerations for SAR and Emergency Response* (MCA, 2024) guidance. The aviation lighting will ensure the WTGs do not present a significant physical obstruction for civil aircraft and SAR operations.
WTGs will be fitted with MOD accredited aviation lighting in addition to any requirements set out under the Air Navigation Order (ANO). This is likely to involve omni-directional red lighting or infrared COMBI lighting but will be confirmed with the MOD.	To comply with the request from the MOD. The aviation lighting will ensure the WTGs do not present a significant physical obstruction for low flying military aircraft.
Array Area location has changed and its size has reduced since scoping	The Array Area has moved further west and therefore further from all aviation and radar infrastructure. The reduction in Array Area footprint means that a lesser horizontal sector is covered by the WTGs.
Number of WTGs reducing from 14 to 10 since scoping	Fewer WTGs means that there are fewer structures in the environment that can affect aviation and radar
Management Plans	
Lighting and Marking Management Plan (LMMP)	The set out the lighting and marking scheme that will be implemented for the WTGs. This will include both marine and aviation lighting and marking. The LMMP will secure the embedded aviation lighting mitigation measures outlined in this table.

61. Methods of reducing visible aviation lighting effects in relation to other topics (e.g., landscape and visual) will be applied where possible and with permission from the CAA and MCA. The specific MOD accredited lighting will also be discussed with the MOD. The specific aviation lighting scheme will be determined post consent by way of a planning condition.

62. It is best practice to liaise with the relevant stakeholders, in this case the CAA, MOD, and MCA during the construction phase where relevant.

63. The CAA should also be notified of the proposed development and any proposed cranes. All cranes and obstacle notifications to the CAA should be made to the Airspace Coordination and

Obstacle Management Service (ACOMS) service. The registration process is via the CAA customer portal to access the ACOMS service to submit any notifications[1,2].

27.8 Assessment of Environmental Effects

64. The impacts and effects associated with operation and maintenance of the proposed Project are outlined in the sections below.

27.8.1. Operation and Maintenance (O&M) Effects

Radar Clutter

Manorbier PSR

65. Clutter could be experienced on the radar due to reflection of the radar signal by WTGs. The clutter could be mistaken for other aircraft by an air traffic controller.

66. The location of Manorbier PSR relative to the Array Area is shown in **Figure 27-1** of this chapter and **Figure 27A-2 of Appendix 27A**.

Magnitude of impact

67. Technical impacts upon the Manorbier PSR are possible; however, the radar is understood to be predominantly used by the MOD for ensuring that aircraft do not enter D115A at ADR Manorbier. Considering the substantial distance between the Array Area and D115A, significant operational impacts are not predicted. The magnitude is therefore considered to be **Small**.

Sensitivity of the receptor

68. The Manorbier PSR is of high importance and some level of technical impact can sometimes be operationally accommodated by an air traffic controller, meaning they have moderate capacity to absorb change. The sensitivity of this receptor is therefore considered to be **Medium**.

Significance of the effect

69. The sensitivity of Manorbier PSR is **Medium** and the magnitude of the impact is assessed as **Small**. Therefore, the effect will, be of **Minor adverse** significance, which is **not significant** in EIA terms.

Hartland Point PSR

70. Clutter could be experienced on the radar due to reflection of the radar signal by WTGs. The clutter could be mistaken for other aircraft by an air traffic controller.

71. The location of Hartland Point PSR relative to the Array Area is shown in **Figure 27-1** of this chapter and **Figure 27A-2 of Appendix 27A**.

Magnitude of impact

72. Technical impacts upon the Hartland Point PSR may not materialise due to the radar's increased performance, features for accommodating wind farms (see **Section 27.5** of **Appendix 27A**), and distance of over 70 km, which will increase the likelihood the radar features can disregard WTG clutter.

[1] https://www.caa.co.uk/commercial-industry/airspace/event-and-obstacle-notification/crane-notification/
[2] https://www.caa.co.uk/commercial-industry/airspace/event-and-obstacle-notification/obstacle-notification/

73. Should any technical impacts remain, the proposed development is not predicted to be in a sensitive location for the MOD and, as such, it is predicted the proposed Project can be accommodated by an air traffic controller.

74. The magnitude is therefore considered to be **Small**.

Sensitivity of the receptor

75. The Hartland Point PSR is of high importance and some level of technical impact can sometimes be operationally accommodated by an air traffic controller, meaning they have moderate capacity to absorb change. The sensitivity of this receptor is therefore considered to be **Medium**.

Significance of the effect

76. The sensitivity of Hartland Point PSR is considered to be **Medium** and the magnitude of the impact is assessed as **Small**. Therefore, the effect will, be of **Minor adverse** significance, which is **not significant** in EIA terms.

Cornwall Airport Newquay PSR

77. Clutter could on the radar due to reflection of the radar signal by WTGs. The clutter could be mistaken for other aircraft by an air traffic controller.

78. The location of Cornwall Airport Newquay PSR relative to the Array Area is shown in **Figure 27-1** of this chapter and **Figure 27A-2 of Appendix 27A.**

Magnitude of impact

79. Technical impacts upon the Cornwall Airport Newquay PSR are possible because the WTGs are within LOS to the radar.

80. The Array Area is significantly beyond the distance in which ATC associated with the airport will be provided. An air traffic controller will not be operationally impacted when providing ATC for aircraft in the vicinity of the airport.

81. The Array Area is in a location which LARS could, in theory, be provided to aircraft below FL100 (approx. 10,000ft). If civil aircraft are flying in the area and request FIS from Cornwall Airport Newquay whilst an air traffic controller is experiencing radar interference from the proposed Project, they can choose not to provide the services at that particular moment. Cornwall Airport Newquay are not obliged to provide FIS and it is also common practice for air traffic controllers to provide services to aircraft through non-radar derived services.

82. FIS can also be provided by air traffic controllers at Swanwick Centre ATC by NATS in this location, and therefore an aircraft can request FIS from an alternative Air Traffic Service Unit (ATSU) if Cornwall Airport Newquay are not able to provide services at that particular moment.

83. The magnitude is therefore considered to be **Small**.

Sensitivity of the receptor

84. The Cornwall Airport Newquay PSR is of high importance and some level of technical impact can sometimes be operationally accommodated by an air traffic controller, meaning they have moderate capacity to absorb change. The sensitivity of this receptor is therefore considered to be **Medium**.

Significance of the effect

85. The sensitivity of Cornwall Airport Newquay PSR is considered to be **Medium** and the magnitude of the impact is assessed as **Small**. Therefore, the effect will, be of **Minor adverse** significance, which is **not significant** in EIA terms.

Burrington PSR

86. Clutter could on the radar due to reflection of the radar signal by WTGs. The clutter could be mistaken for other aircraft by an air traffic controller.

87. The location of Burrington PSR relative to the Array Area is shown in **Figure 27-1** of this chapter and **Figure 27A-2 of Appendix 27A**.

Magnitude of impact

88. Technical impacts upon the Burrington PSR cannot be ruled out due to over the horizon detection. These technical impacts constitute a significant operational impact due to increased workload of an air traffic controller providing services in the area.

89. The magnitude is therefore considered to be **High**.

Sensitivity of the receptor

90. The Burrington PSR is of high importance and some level of technical impact can sometimes be operationally accommodated by an air traffic controller, meaning they have moderate capacity to absorb change. The sensitivity of this receptor is therefore considered to be **Medium**.

Significance of the effect

91. The sensitivity of Burrington PSR is **Medium** and the magnitude of the impact is assessed as **High**. Therefore, the effect will, be of **Moderate adverse** significance, which is **significant** in EIA terms.

Further mitigation and residual effects

92. To mitigate the impacts upon the Burrington PSR, technical mitigation in the form of radar blanking, whereby a zone is defined around the wind farm within which radar returns are suppressed (see **Section 27.6** of **Appendix 27A**), will be implemented in agreement with NATS.

93. Taking the above mitigation into consideration, the magnitude has been lowered (**Negligible**) and the sensitivity remains the same (**Medium**) meaning the residual effect will be of **Negligible** significance.

Physical Obstruction

Military Low Flying

94. The WTGs can pose as a physical obstruction for military aircraft that are conducting low flying activities, particularly when flying at night.

Magnitude of impact

95. The Array Area is offshore and not within any of the defined military low flying areas. Nevertheless, the MOD may conduct low flying operations in this area.

96. The magnitude is therefore considered to be **High**.

Sensitivity of the receptor

97. The Array Area is outside the defined military low flying areas; however, military low flying operations still may take place. The sensitivity of this receptor is therefore considered to be **Medium**.

Significance of the effect

98. The sensitivity of military low flying is considered to be **Medium** and the magnitude of the impact is assessed as **High**. Therefore, the effect will, be of **Major adverse** significance, which is **significant** in EIA terms.

Further mitigation and residual effects

99. Sufficient information is expected to be requested by the MOD to ensure accurate marking of the WTGs on aeronautical charts. This includes the finalised WTG locations and heights above sea level.

100. This will be provided by the Applicant and can be secured by way of a planning condition.

101. Taking the above mitigation into consideration, the magnitude remains the same (**Small**) and the sensitivity remains the same (**Medium**) meaning the residual effect will be of **Minor adverse** significance.

Civil Aircraft

102. WTGs are tall structures that could pose as a physical obstruction for civil aircraft flying in the area.

Magnitude of impact

103. The WTGs require aviation lighting and marking on the relevant aeronautical charts due to their significant height and their high potential to be a collision risk for civil aircraft.

104. Aviation lighting will be implemented as part of the embedded mitigation measures (see **Section 27.7**); therefore, the WTGs will comply with the necessary lighting standards and will be visible to pilots flying aircraft in the area.

105. The magnitude is therefore considered to be **Small**.

Sensitivity of the receptor

106. The Array Area is not located in the vicinity of an aerodrome, nor is it expected to be in an operationally sensitive area. However, the Array Area is located in uncontrolled airspace where aircraft would typically fly under VFR.

107. The sensitivity of this receptor is therefore considered to be **Medium**.

Significance of the effect

108. The sensitivity of civil aircraft is considered to be **Medium** and the magnitude of the impact is assessed as **Small**. Therefore, the effect will be of **Minor adverse** significance, which is **not significant** in EIA terms.

Further mitigation and residual effects

109. The finalised WTG locations and heights above sea level will be provided to the CAA to ensure accurate marking of the WTGs on aeronautical charts.

110. This will be provided by the Applicant and can be secured by way of a planning condition.

111. Taking the above mitigation into consideration, the magnitude remains the same (**Small**) and the sensitivity remains the same (**Medium**) meaning the residual effect will be of **Minor adverse** significance.

Helicopter Operations

112. The WTGs can pose as a physical obstruction for helicopter operations, particularly for SAR helicopters when flying at night.

Magnitude of impact

113. The WTGs will introduce significant obstructions into the existing environment that will need to be evaded by helicopter pilots.

114. Aviation lighting will be implemented as part of the embedded mitigation measures (see **Section 27.7**); therefore, the WTGs will comply with the necessary lighting standards and will be visible to SAR helicopter pilots flying in the area.

115. The magnitude is therefore considered to be **Small**.

Sensitivity of the receptor

116. Helicopter pilots are trained to deal with dynamic and challenging environments; however, SAR operations are of high importance and the addition of a large obstacle would affect their approach.

117. The sensitivity of this receptor is therefore considered to be **Medium**.

Significance of the effect

118. The sensitivity of helicopter operations is considered to be **Medium** and the magnitude of the impact is assessed as **Small**. Therefore, the effect will, be of **Minor adverse** significance, which is **not significant** in EIA terms.

27.8.2. Summary of Residual Environmental Effects

119. This chapter of the ES has assessed the potential environmental effects on aviation from the construction, operation and maintenance, and decommissioning phases of the proposed Project. Where significant effects have been identified, additional mitigation has been considered and incorporated into the assessment.

120. **Table 27-12** summarises the impact assessment undertaken and confirms the significance of any residual effects, following the application of additional mitigation.

27.9 Summary of Additional Mitigation Measures

121. Radar blanking, whereby a zone is defined around the wind farm within which radar returns are suppressed (see **Section 27.6** of **Appendix 27A**), will be implemented in agreement with NATS.

122. The MOD and CAA will be notified of the final WTG locations and heights above sea level to ensure the WTGs are marked on the relevant aeronautical charts.

27.9.1. Monitoring

123. No monitoring in the context of aviation and radar is expected to be required.

27.10 Summary of Effects and Conclusions

124. This section summarises the residual significant effects of the proposed Project on aviation and radar following the implementation of mitigation.

Table 27-12. Assessment summary

Potential Impact	Receptor	Receptor Sensitivity	Magnitude of impact	Significance of effect	Additional Mitigation	Residual Significance of Effect
Operation and Maintenance						
Radar clutter	Manorbier military ATC radar	Medium	Small	Minor adverse	None	Minor adverse
	Hartland Point military ATC radar	Medium	Small	Minor adverse	None	Minor adverse
	Cornwall Airport Newquay ATC radar	Medium	Small	Minor adverse	None	Minor adverse
	Burrington en-route radar	Medium	Medium	Moderate adverse	Radar blanking	Negligible
Physical obstruction	Military low flying	Medium	Small	Minor adverse	Information provided to stakeholders so that the WTGs can be marked on the relevant aeronautical charts	Minor adverse
	Civil aircraft	Medium	Small	Minor adverse		Minor adverse
	Helicopter operations	Medium	Small	Minor adverse		Minor adverse

27.11 Cumulative Effects of the Project

27.11.1. Introduction

125. Cumulative effects are those effects upon receptors arising from the proposed Project alongside all existing, and/ or reasonably foreseeable projects, plans and activities that result in cumulative effects with any element of the proposed Project. Existing Projects are generally considered as part of the baseline and as such are considered within the impact assessment presented in **Section 27.5** above.

126. This section assesses potential cumulative effects on aviation and radar from identified projects, plans and activities that have the potential to act cumulatively with the proposed Project.

127. PINS Advice 17: Cumulative Effects Assessment (CEA) (PINS, 2019) suggests that CEA follows a four-stage process. The aim of this approach is to accurately determine relevant projects and associated relationships with scoped in receptors identified in the ES, to be included within the interproject CEA.

128. The approach to the assessment of cumulative effects is detailed in **Appendix 5B: Approach to Cumulative Effects Assessment** and is also summarised in **Table 27-13.**

Table 27-13. PINS advice 17 stages of the CEA process

CEA Stage	Activity
Stage 1	Determine a zone of influence (ZoI) via desk study for each topic receptor scoped into the ES. This will establish a *long list* of projects within each ZoI that will be shortlisted in Stage 2. This list of plans and projects/activities is drawn up through a desk study of planning applications, development plan documents, relevant development frameworks and any other available sources to identify 'other development' within the ZoI. Information on each project (location, development type, status, etc.) is documented, along with the certainty or tier assigned to the 'other development' (i.e. confidence it will take place in the current form and when it will take place in relation to the project). PINS notes that the project should then consult with the relevant planning authority/ authorities and statutory consultees regarding the long list.
Stage 2	Screening of the long list identified in Stage 1, to establish a short list for the CEA. Screening is based on the criteria presented in the scoping report and subsequent comments by the regulator and statutory consultees. PINS has provided inclusions/ exclusion threshold criteria, against which the potential for 'other developments' to give rise to significant cumulative effects by virtue of overlaps in temporal scope, the scale and nature of the 'other developments' and /or receiving environment, or any other relevant factors is assessed. From this assessment, a shortlist of 'other developments' to be included in the CEA is produced. It is noted that documented information on each of the 'other developments' is likely to be high level at this stage, outlining the key issues to take forward.
Stage 3	Gathering of all information available on short listed projects generated in Stage 2. At this stage all available data and information about the shortlisted projects that will be included in the CEA is collected to inform the assessment. This should utilise the most current information for each project in the public domain, and assess the assumptions and limitations of the information collected on each shortlisted project.
Stage 4	Each of the shortlisted projects are reviewed in turn by the different topics to assess whether cumulative effects may arise and the nature of those effects (i.e. beneficial or adverse). The significance of the effects on environmental receptors

CEA Stage	Activity
	is established within each ES technical chapters. Where significant adverse cumulative effects are identified, mitigation measures are also considered within the CEA alongside the mechanism to secure that mitigation, e.g. consent condition requirements.

27.11.2. Scope of Cumulative Effects Assessment Aviation and Radar

129. The following O&M effects have been scoped into the CEA for aviation and radar:

- Radar clutter impacts for Manorbier PSR and Hartland Point PSR (MOD) – Clutter experienced on a radar display due to reflection of the radar signal by WTGs, which could be mistaken for other aircraft by an air traffic controller;
- Physical obstruction – WTGs posing as a physical obstruction for military aircraft that are conducting low flying activities, civil aircraft flying in the area, or SAR helicopter operations, particularly when flying at night.

130. Radar clutter impacts for Burrington PSR (NATS) have been scoped out of the CEA for aviation and radar due to the mitigation measures reducing the residual environmental effect to Negligible.

131. All construction and decommissioning effects have been scoped out of the CEA as they were scoped out of the assessment.

132. **Table 27-14** presents the short list of projects identified and included within the CEA for aviation and radar. These projects were shortlisted due to being offshore wind farms, which could also impact upon aviation and radar, and their proximity to the Array Area.

133. The other projects from the long list were not included due to not being offshore wind farms, meaning the impact pathways will be different to the proposed Project, and/or due to the significant separation distance from the proposed Project Array Area, meaning that no conceivable cumulative effect could be experienced from both projects.

134. The definitions of the project tiers are set out in PINS Advice 17: CEA (PINS, 2019).

Table 27-14. List of projects considered for the aviation and radar cumulative effects assessment

Project Name/Developer	Project Type	Tier and Status	Approx. distance from the proposed Project
Llŷr 2 Floating Offshore Wind Project – Floventis	Offshore Wind Farm	Tier 2 – Scoping submitted	0 km east
Erebus – Blue Gem Wind	Offshore Wind Farm	Tier 1 - Consented	5 km northwest
Crown Estate Project Development Area (PDA) 1	Offshore Wind Farm	Tier 3 – Leasing Round 5	0 km west
Crown Estate PDA 2	Offshore Wind Farm	Tier 3 – Leasing Round 5	14 km southwest
Crown Estate PDA 3	Offshore Wind Farm	Tier 3 – Leasing Round 5	29 km south
White Cross	Offshore Wind Farm	Tier 1 – Application submitted	17 km southeast

135. The location of the projects listed in **Table 27-14** are shown in **Figure 27-2.**

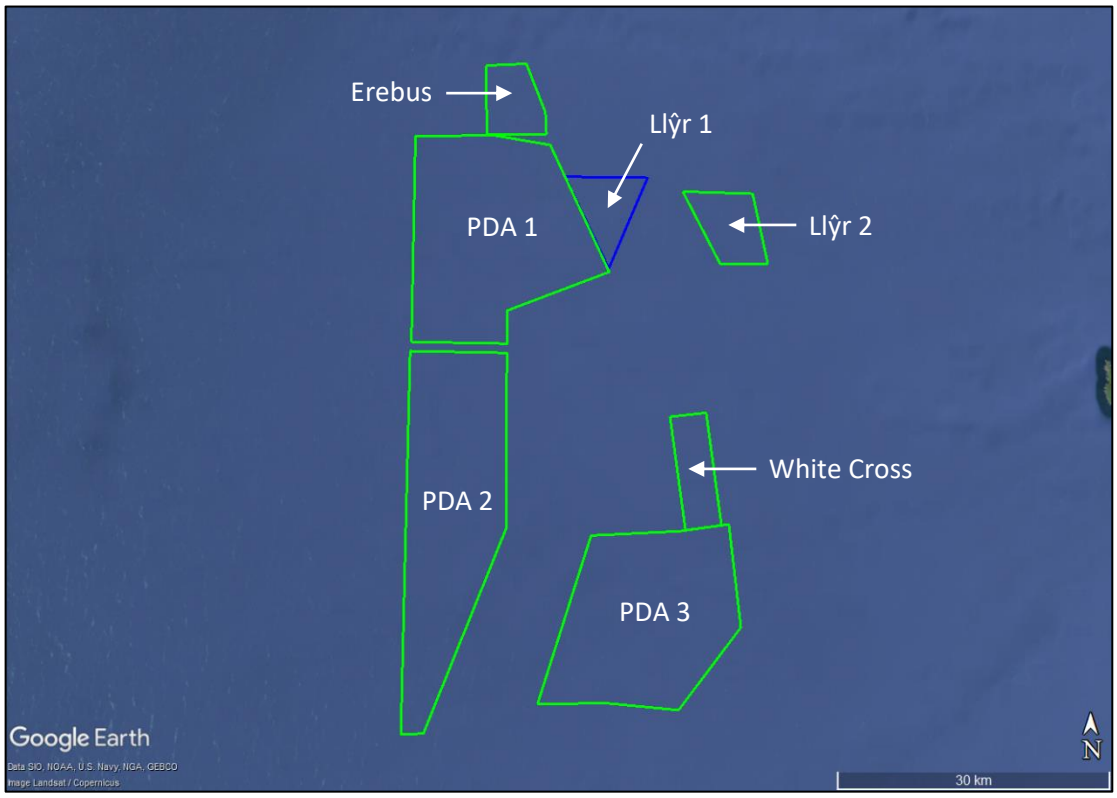

Figure 27-2. Cumulative projects considered for the aviation and radar cumulative effects assessment

27.11.3. Cumulative Effect Assessment

Radar Clutter – Manorbier PSR and Hartland Point PSR

136. The Array Area is in a similar location to the six surrounding offshore wind farms relative to both radars. The potential cumulative effect will be the cumulative radar clutter and possibly desensitisation of the radar's receiver to wanted returns through an increase in the demands of the radar system through multiple sectors of clutter.

137. On the basis that Llŷr 1 would not be detected by the radar, any impacts can be operationally accommodated, or significant will be mitigated, it is predicted that the Erebus offshore wind farm and White Cross offshore wind project (Tier 1) will have been accepted on the same basis. The magnitude of the effect is therefore considered to be **Small**.

138. Radar operators are not predicted to consider the effect of proposed projects (Tier 2 and Tier 3) when determining the cumulative impact upon their infrastructure, and will only consider cumulative effects for Tier 1 and operational sites. The magnitude of the effect associated with the Llŷr 2 and Crown Estate PDAs is therefore considered to be **Negligible**.

139. The Manorbier PSR, Hartland Point PSR, and Cornwall Airport Newquay PSR are of high importance and some level of technical impact can sometimes be operationally accommodated by an air traffic controller, meaning they have moderate capacity to absorb change. The sensitivity of this receptor is therefore considered to be **Medium**.

140. The sensitivity of Manorbier PSR, Hartland Point PSR, and Cornwall Airport Newquay PSR are considered to be **Medium** and the magnitude of the effect is assessed as **Small**. Therefore,

the cumulative impact of surrounding offshore wind farms on radar clutter is **Minor adverse** and **not significant**.

Physical Obstruction

141. The WTGs would introduce obstructions into the surrounding environment and reduce the airspace available for surrounding aviation activity. Multiple offshore wind farms in a given sector would introduce further obstructions and further reduce the available airspace for surrounding aviation activity.

142. On the basis that Llŷr 1 and the six surrounding wind farms comply with appropriate lighting requirements and are marked on the relevant aeronautical charts; civil aircraft, military aircraft, and SAR helicopters will be able to discern the WTGs and evade them accordingly. The magnitude of the effect is therefore considered to be **Small.**

143. The Array Area is not in a location in which civil aircraft, military aircraft, or SAR helicopters will be routinely flying; however, all aircraft types may require use of this airspace. The sensitivity of this receptor is therefore considered to be **Medium**.

144. The sensitivity of physical obstruction is considered to be **Medium** and the magnitude of the effect is assessed as **Small**. Therefore, the cumulative impact of surrounding offshore wind farms on physical obstruction is **Minor adverse** and **not significant**.

27.12 Inter-related Effects of the proposed Project

145. The term 'Inter-related' considers the environmental interactions ('inter-relationships') with other receptors affected by the proposed Project. These are referred to in the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 and further described in **Chapter 31 – Inter-related Effect Assessment.**

146. As set out in PINS Advice Note 17 (PINS), 2019, *inter-related -project effects*, or 'interrelationships between topics', derive from combinations of different project specific impacts which, when acting together on the same receptor, could result in a new or different effect, or an effect of greater significance than the project effects, when considered in isolation.

147. Inter-related effects comprise the following:

- *Project lifetime effects*: effects that have the potential to occur during more than one phase of the proposed Project (i.e. construction, operation and maintenance and decommissioning) and also to interact in a way that could potentially create a more significant effect than if it was assessed in isolation
- *Receptor-led effects*: effects that have the potential to interact, spatially and temporally, to create inter-related effects on a receptor.

148. **Chapter 31 - Inter-related Effects Assessment** details the approach to the inter-related effects assessment and includes a description of the likely inter-related effects that may occur as a result of the proposed Project on aviation and radar.

27.12.1. Inter-related Project lifetime effects

149. No inter-related project lifetime effects have been identified in the context of aviation and radar as only O&M effect pathways are scoped into the assessment – see **Section 27.8**.

27.12.2. Inter-related receptor-led effects

150. There is potential for spatial and temporal interactions between effects of the WTGs as physical obstructions to civil aircraft, military low flying aircraft, and SAR helicopter operations.

151. The greatest potential for inter-related effects is predicted to occur through the interaction of civil aircraft, military low flying aircraft, and SAR helicopter operations in the area due to the addition of obstructions to be evaded and reduction in available airspace.

152. With respect to this interaction, these individual impacts were assigned a significance of minor adverse as standalone impacts and although potential combined impacts may arise (i.e. spatial and temporal use of airspace around the Array Area), it is predicted that this will not be any more significant than the individual impacts in isolation. This is because the ATS provision within controlled airspace would ensure sufficient separation, and the rules of air, including the 'see and be seen principle', would mean that pilots will take necessary steps to avoid collision. The reduction in available airspace is also only limited to a defined sector and up to a maximum height of 325 m (1,067 feet (ft)) above sea level. As such, these interactions are predicted to be no greater in significance than that for the individual effects assessed in isolation.

27.13 Transboundary Effects

153. A transboundary effect refers to the impacts or effects of a project that extend beyond the boundaries of the United Kingdom and have the potential to affect the environment of other countries within the European Economic Area (EEA). These effects can occur either from the proposed Project on its own or when combined with the effects of other projects or activities in the wider geographical area.

154. In terms of the impacts on aviation and radar receptors, impacts will be localised to the extent of the London FIR that covers England and Wales. The London FIR has no obligations to the Shannon FIR that covers Ireland and is managed by the Irish Aviation Authority. The IAA has also confirmed they have no concerns during consultation (see **Section 27.3**).

155. Given the intervening distance to all other neighbouring European Economic Area (EEA) states, there is no potential for transboundary impacts and resultant effects to occur.

27.14 References

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