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GLANLLYNFI GARTH WIND FARM

Draft Environmental Statement

Chapter 16 - Other Issues (Aviation and Tele-communications)



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16 Other Issues (Aviation, Radar, Telecommunications, and Utilities)

16.1 Introduction

- 16.1.1. This chapter presents the assessment of the likely significant effects of the Proposed Development with respect to Aviation, Radar, Telecommunications, and Utilities.
- 16.1.2. Aviation radar, microwave and other electromagnetic signals are transmitted throughout the country by a wide range of operators, including statutory agencies and commercial companies. There is potential for interference to affect the transmission of these signals from any large structure, including wind turbines. To understand the potential of the Proposed Development to affect radar, microwave, other radio operations and utilities in the area, consultation has been undertaken with authorities and companies working in this field in Wales.
- 16.1.3. The assessment is based on information obtained to date. It should be read in conjunction with the Proposed Development description provided in **Chapter 4: Development Description**.
- 16.1.4. This chapter describes:
- the legislation, policy and technical guidance that has informed the assessment (**Section 16.2**);
 - consultation and engagement that has been undertaken and how comments from consultees relating to Aviation, Telecommunications and Utilities have been addressed (**Section 16.3**);
 - the methods used for baseline data gathering (**Section 16.4**);
 - overall baseline (**Section 16.5**);
 - embedded measures relevant to Aviation, Telecommunications and Utilities (**Section 16.6**);
 - the scope of the assessment for Aviation, Telecommunications and Utilities (**Section 16.7**);
 - the methods used for the assessment (**Section 16.8**);
 - the assessment of Aviation, Telecommunications and Utilities effects (**Section 16.9**);
 - assessment of cumulative (inter-project) effects (**Section 16.10**);
 - a summary of effects (**Section 16.11**);
 - a summary of further work to be undertaken (**Section 16.12**).

Limitations and assumptions

- 16.1.5. The information provided in this Draft Environmental Statement (ES) is based on current information. The Draft ES has been produced to fulfil Pre-Application Consultation (PAC)

duties of the Applicant and enable consultees to develop an informed view of the likely significant effects of the Proposed Development.

- 16.1.6. Some telecommunications and utilities service providers have not responded to the consultations. Where consultees do not respond, it is presumed their services would be unaffected by the Proposed Development. Refer to **Table 16.6** for a list of consultees.
- 16.1.7. Given the above, there is the possibility that the consultation process has not picked up some services. However, the process has been as inclusive as possible.

16.2 Relevant legislation, planning policy and technical guidance

- 16.2.1. This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to Aviation, Telecommunications and Utilities. Further information on policies relevant to the Proposed Development is provided in **Chapter 5: Legislation and Policy Overview**.

Aviation

Planning Policy

- 16.2.2. A summary of the relevant national and local planning policy is given in **Table 16.1**.

Table 16.1 Planning policy relevant to the Aviation assessment

Technical guidance document	Context
National planning policy	
Future Wales: the National Plan 2040 ¹	The policy sets out that projects will be permitted subject to policy 17 and the following criteria, one of which is criterion 7 set out below: <i>“Policy 18 – Renewable and Low Carbon Energy Developments of National Significance ... 8. there are no unacceptable impacts on the operations of defence facilities and operations (including aviation and radar) or the Mid Wales Low Flying Tactical Training Area (TTA-7T);”</i>
Technical Advice Note (TAN) 8: Planning for Renewable Energy (2005) ² (revoked however used as a guide for this assessment)	Paragraph 2.35 states: <i>“Developments within a specified radius of major airports and aerodromes are subject to mandatory consultation with the Civil Aviation Authority (CAA) and/or the Ministry of Defence (MoD) under the Town and Country Planning (Aerodromes and</i>

¹ Welsh Government (2021). Future Wales: the national plan 2040. (Online) Available at: <https://gov.wales/future-wales-national-plan-2040> (Accessed June 2026).

² Geography & Technology, Welsh Government (2005). Technical Advice Note (TAN) 8: Planning for Renewable Energy. (Online) Available at: <https://apps.caerphilly.gov.uk/LDP/Examination/PDF/W66-TAN-8-Renewable-Energy.pdf> (Accessed June 2026).

Technical guidance document	Context
	<i>Technical Sites) Directive 1992. The CAA will inform the applicant of any civilian airfields that are likely to be affected, but it is the responsibility of the applicant/ planning authority to consult the airfield management at the airfield in question."</i> Paragraph 2.36 states: <i>"Lights are only required on structures that are over 150 m high."</i> Paragraph 2.38 states: <i>"Any large structure is liable to show up on radar, but wind turbines can present a particular problem as they can be interpreted by radar as a moving object, which is only intermittently seen (as the nacelle rotates to face the wind). There is a consultation zone and an advisory zone around every civilian and military air traffic radar, but objections may sometimes be raised in respect of developments further afield. Consultations are also required in respect of other defence and meteorological radar. Developers will need to closely consult over aviation and other radar issues and the British Wind Energy Association web site gives details of how this can be achieved. Local planning authorities should be aware of the statutory consultees applicable to their particular area."</i> Paragraph 2.39 gives a list of aviation (amongst other) consultees in addition to statutory consultees. The aviation consultees referred to are: The Civil Aviation Authority (CAA), the Ministry of Defence (MoD), and National Air Traffic Services (NATS).
Local planning policy	
Bridgend County Borough: Local Development Plan 2018-2033 (adopted March 2024) ³	With respect to Aviation, there is no content.

Technical Guidance

16.2.3. A summary of the technical guidance for Aviation is given in **Table 16.2**.

³ Bridgend County Borough (2024). Local Development Plan 2018-2033. [online] Available at: <https://www.bridgend.gov.uk/media/izcfqp1f/written-statement.pdf> [accessed June 2026]

Table 16.2 Technical guidance relevant to the aviation assessment

Technical guidance document	Context
CAP 764 (2025) – Civil Aviation Authority (CAA) Policy and Guidelines on Wind Turbines ⁴	This document provides CAA policy and guidance on a range of issues associated with wind turbines and their effect on aviation that will need to be considered by aviation stakeholders, wind energy developers and Local Planning Authorities (LPAs) when assessing the viability of wind turbine developments. Chapter 2 – Safeguarding and Mitigation, Paragraph 2.42 states: <i>“Where an Air Navigation Service Providers (ANSP) determines that it is likely that a planned wind turbine development would result in any of the above effects on their communications, navigation and surveillance (CNS) infrastructure, this may not, in itself, be sufficient reason to justify grounds for rejection of the planning application. The ANSP must determine whether the effect on the CNS infrastructure has a negative impact on the provision of the air traffic services (ATS) . The developer should pay for an assessment of appropriate mitigating actions that could be taken by the ANSP and/or wind energy developer to deal with the negative impact. The position of an ANSP at inquiry would be significantly degraded if they had not considered all potentially appropriate mitigations.”</i> And Chapter 3 – Considerations during planning, Paragraph 3.6 states: <i>Whilst not definitive, it should be anticipated that any wind turbine development within the following criteria might have an impact upon civil aerodrome - related operations.</i>
CAP 670 – Air Traffic Services Safety Requirements ⁵	The document defines the safeguarding requirements for safeguarding of Communications, Navigation and Surveillance (CNS) equipment in aviation. Part B, Section 4, GEN 01 states: <i>“GEN01.6 Wind turbine developments need to be considered as a safeguarding activity.</i> <i>GEN01.7 The ATS Provider or ANSP is responsible for ensuring, as far as is reasonably practicable, that such development does not impact on the safety of the ATS environment.</i> <i>GEN01.8 The ATS Provider or ANSP is responsible for deciding whether or not it can accept any degradation to the ATS environment.</i>

⁴ Civil Aviation Authority (2025). CAA Policy and Guidelines on Wind Turbines. CAP 764. (Online) Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-764> (Accessed June 2026).

⁵ Civil Aviation Authority (2019). Air Traffic Services Safety Requirements. CAP 670. (Online) Available at: [CAP 670: Air Traffic Services Safety Requirements | UK Civil Aviation Authority](#) (Accessed June 2026).

Technical guidance document	Context
	<i>GEN01.9 If the ATS Provider or ANSP predicts that the degradation is unacceptable then it should make representations to the appropriate Local Authority.”</i>
CAP 168 – Licensing of Aerodromes ⁶	This document provides an overview of requirements and the regulatory framework as well as requirements and guidance for Air Traffic Services, Communication, Navigation, Surveillance, Meteorological and Information and Alerting Systems. Chapter 4 – The Assessment and Treatment of Obstacles, Paragraph 1.1, states: <i>“The effective utilisation of an aerodrome may be influenced by natural features and manufactured constructions inside and outside its boundary. These may result in limitations on the distance available for take-off and landing and on the range of meteorological conditions in which take-off and landing can be undertaken. For these reasons, certain areas of the local airspace must be regarded as integral parts of the aerodrome environment. The degree of freedom from obstacles in these areas is as important in the granting and retention of an aerodrome licence as the more obvious physical requirements of the runways and their associated runway strips and is determined by survey in accordance with CAP1732, Aerodrome Survey Guidance and CAP232, Aerodrome Survey Information.”</i>
CAP 774 UK Flight Information Services (2021) Version 4 ⁷	The UK Flight Information Services (CAP 774) details the suite of air traffic services which are the only services provided in class G airspace within the UK Flight Information Region. This document is equally applicable to all civilian and military pilots, air traffic controllers, and flight information service officers.
CAP 738 – Safeguarding of Aerodromes ⁸	This document offers guidance to those responsible for the safe operation of an aerodrome or a technical site, to help them assess what impact a proposed development or construction might have on that operation. Chapter 1 – Safeguarding of Aerodromes, Paragraph 1.1, states: <i>“A process of consultation between a Local Planning Authority (LPA) and consultees, which is made obligatory by Statutory Direction, safeguards some aerodromes and aeronautical technical sites in the United Kingdom. This is called ‘statutory’ or ‘official’ safeguarding”.</i>
Civil Aviation Authority (2025) Civil Aviation Publication 493 Manual of Air Traffic Services, Ed. 12.0. ⁹	The Manual of Air Traffic Services contains procedures, instructions and information which are intended to form the basis of air traffic services within the United Kingdom. It is published for the guidance of civil air traffic controllers and may

⁶ Civil Aviation Authority (2022). Licensing of Aerodromes. CAP 168. (Online) Available at: [CAP 168: Licensing of Aerodromes | UK Civil Aviation Authority](https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-168) (Accessed June 2026).

⁷ CAP 774 UK Flight Information Services (2021) Version 4. (Online) Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-774> (Accessed May 2026).

⁸ Civil Aviation Authority (2020). Safeguarding of Aerodromes. CAP 738. (Online) Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-738> (Accessed June 2026).

⁹ Civil Aviation Authority (2025) Civil Aviation Publication 493 Manual of Air Traffic Services, Ed. 12.0. (Online) Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-493> (Accessed May 2026).

Technical guidance document	Context
	also be of general interest to others associated with civil aviation.
Planning Circular 2/2003 Safeguarding of Aerodromes, Technical Sites and Military Explosive Storage Areas ¹⁰	The town and country planning (safeguarded aerodromes, technical sites and military explosives storage areas) direction 2002 applies to military explosives storage areas in addition to aerodromes and technical sites.
Civil Aviation Authority (2025) Civil Aviation Publication 493 Manual of Air Traffic Services, Ed. 12.0. ¹¹	The Manual of Air Traffic Services contains procedures, instructions and information which are intended to form the basis of air traffic services within the United Kingdom.
Civil Aviation Authority Civil Aviation Publication 393 The Air Navigation Order (2016) and Regulation, Version 6 (2021). ¹²	The Air Navigation Order includes The Civil Aviation Authority Regulations made under powers in the Civil Aviation Act (1962) and the Air Navigation Order (2016).

Telecommunications and Utilities

Planning Policy

- 16.2.4. A summary of the relevant national and local planning policy of relevance to telecommunications and utilities is given in **Table 16.3**.

Table 16.3 Planning policy relevant to the Telecommunications and Utilities assessment.

Technical guidance document	Context
National planning policy	
Future Wales: the National Plan 2040 ¹³	This states that these types of DNS will be permitted subject to: <i>“Policy 18 – Renewable and Low Carbon Energy Developments of National Significance”</i> And criterion: <i>“7. there are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance;”</i>

¹⁰ Planning Circular 2/2003: Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) Direction 2003. (Online) Available at: <https://www.gov.uk/government/publications/safeguarding-aerodromes-technical-sites-and-military-explosives-storage-areas> (Accessed May 2026).

¹¹ Civil Aviation Authority (2025) Civil Aviation Publication 493 Manual of Air Traffic Services, Ed. 12.0. (Online) Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-493> (Accessed June 2026).

¹² Civil Aviation Authority Civil Aviation Publication 393 The Air Navigation Order (2016) and Regulation. (Online) Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-393> (Accessed June 2026).

¹³ Welsh Government (2021). Future Wales: the national plan 2040. (Online) Available at: <https://gov.wales/future-wales-national-plan-2040> (Accessed June 2026).

Technical guidance document	Context
Technical Advice Note (TAN) 8: Planning for Renewable Energy (2005) ¹⁴ (revoked however used as a guide for this assessment)	TAN 8 states: “A wind turbine can interfere with electromagnetic transmissions in two ways – by emitting an electromagnetic signal itself, and by interfering with other electromagnetic signals. <i>Provided careful attention is paid to siting, wind turbines should not cause any significant problems of electromagnetic interference, i.e. adverse effects on communication systems which use electromagnetic waves as the transmission medium (e.g. television, radio or microwave links). Specialist organisations responsible for the operation of the electromagnetic links typically require a 100m clearance either side of a line of sight link from the swept area of turbine blades.”</i> The document goes on to recommend a list of possible consultees referring to the Office of Communications (Ofcom) which holds a central register of all civil radio communication operators in the UK and acts as a central point of contact for identifying specific consultees relevant to a site. It does recognise that this list is not exhaustive and that it may be necessary to consult local utility companies and emergency services along with any other organisations which may be deemed relevant.
Local planning policy	
Bridgend County Borough: Local Development Plan 2018-2033 (adopted March 2024) ¹⁵	With respect to Telecommunications and Utilities, there is no content.

Technical Guidance

- 16.2.5. A summary of the technical guidance for telecommunications and utilities is given in **Table 16.4**.

Table 16.4 Technical guidance relevant to the Telecommunications and Utilities assessment

Technical guidance document	Context
Practice Guidance – Planning Implications of Renewable and Low Carbon Energy. ¹⁶ Welsh Assembly Government (2011). Para 3.4.24-3.4.26	The assessment will take due cognisance of the following paragraphs from the guidance document: <i>“Wind turbines, including micro turbines, can also interfere with telecommunications (i.e. TV, radio and phone signals) by blocking or deflecting those requiring line of sight or by the scattering of transmission signals. Links crossing the site of wind farms should be</i>

¹⁴ Geography & Technology, Welsh Government (2005). Technical Advice Note (TAN) 8: Planning for Renewable Energy. (Online) Available at: <https://apps.caerphilly.gov.uk/LDP/Examination/PDF/W66-TAN-8-Renewable-Energy.pdf> (Accessed June 2026).

¹⁵ Bridgend County Borough (2024). Local Development Plan 2018-2033. [online] Available at: <https://www.bridgend.gov.uk/media/izcfqp1f/written-statement.pdf> [accessed June 2026]

¹⁶ Welsh Assembly Government (2011). Practice Guidance – Planning Implications of Renewable and Low Carbon Energy. (Online) Available at: <https://gov.wales/sites/default/files/publications/2018-09/planning-implications-renewable-low-carbon-energy-development.pdf> (Accessed June 2026).

Technical guidance document	Context
	<i>identified by consultation with Ofcom. Ofcom will check whether any part of a wind turbine site, either individual turbines or part of a wind farm, falls within 0.5 – 1.0 km (depending on the signal frequency) of the path of a fixed link, and if so, will instruct the developer to contact the appropriate fixed link operator. Developers may also wish to contact interested bodies directly, including local utility companies and emergency services.</i> <i>Scattering of signals mainly affects domestic TV (both analogue and to a lesser extent digital TV) and radio broadcasts. Wind turbines can affect domestic television reception up to 5 km from the turbines. Terrestrial television transmissions for domestic reception within the UK are the joint responsibility of the BBC and Ofcom.</i> <i>Where fixed link signals are potentially blocked by proposed wind turbines, a detailed investigation of the likely impact should be sought from a competent supplier. It is often possible to mitigate impacts by careful siting of individual turbines within a site so that turbine blades avoid a buffer zone, typically 100 m either side of the signal path. Failing this, it may be necessary for the developer to pay for a signal to be re-routed around the wind turbine(s). Where site investigations reveal a likely impact on domestic radio or TV reception, various solutions are possible including upgrading of domestic aerials or delivery of the signal by other means, for example by cable."</i>

16.3 Consultation and Engagement

Overview

- 16.3.1. The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Chapter 2: Approach to the Environmental Impact Assessment (EIA)**.

Scoping Opinion

- 16.3.2. A Scoping Direction was issued by the Planning Inspectorate, on behalf of the Welsh Ministers, on 12 June 2026. A summary of the relevant responses received in the Scoping Opinion in relation to Aviation, Telecommunications and Utilities and confirmation of how these have been addressed within the assessment to date is presented in **Table 16.5**.
- 16.3.3. Not all of the Scoping Direction comments have been addressed at this stage, however, all comments will be addressed within the ES submitted with application for DNS consent.

Table 16.5 Summary of EIA Scoping Direction Responses for Aviation, Telecommunications and Utilities

Consultee	Consideration	How addressed in this Draft ES
PEDW (ID.79)	Defence Infrastructure Organisation and the concerns that the development may introduce a physical obstruction to military aviation operations. This must be addressed within this ES.	Wind Farm Aviation Safeguarding Ltd (WFAS) has undertaken analysis of the effects on military operations and a separate aviation lighting assessment will be undertaken and submitted as part of the final ES for consideration by the Ministry of Defence and the CAA. To note the lighting assessment will inform any mitigation for any identified effects.
PEDW (ID.80)	Cardiff Airport have highlighted the need for assessment of the proposed development's potential to impact the airport radar and to affect airport operations.	WFAS has undertaken a radar assessment (see Section 16.9) and this will be supplemented by a NATS Technical and Operation Assessment (TOPA) as required by Cardiff Airport.
PEDW	Telecommunications, Broadcast Services and Utilities	Consultation has been undertaken with relevant non-statutory consultees, i.e., operators who may be concerned that the proposal could affect their services, see Table 16.6 .

Technical Engagement

- 16.3.4. Technical engagement with consultees in relation to Aviation, Telecommunications and Utilities is ongoing. A summary of the technical engagement undertaken to date is outlined in **Table 16.6**.

Table 16.6 Technical engagement on the Aviation, Telecommunications and Utilities assessment

Issue raised	Consultee	Consideration	How addressed in this Draft ES
Telecommunications and Utilities	Airwave Solutions	Consulted as part of exercise	Airwave were commissioned to undertake initial analysis of the impact on the links they managed. As part of this exercise, they identified one link that passes through the Southern Array of the Proposed Development. They have initially objected.

Issue raised	Consultee	Consideration	How addressed in this Draft ES
			Therefore, discussions are continuing with Airwave to understand potential mitigation.
	Arqiva / National Grid Wireless (BBC, ITV and the majority of the UK's radio transmission network)	Consulted as part of exercise	Responded with no objection
	BT	Consulted as part of exercise	Responded with no objection
	CityFibre	Consulted as part of exercise	No response
	Colt	Consulted as part of exercise	Responded with no objection
	CSS Spectrum Management Services Ltd	Consulted as part of exercise	No response
	GTC	Consulted as part of exercise	Responded with no objection
	JRC Spectrum Management	Consulted as part of exercise	Responded with no objection
	Linesearch Before U Dig ¹⁷	Industry utilities search identifies key operators within an area.	Enquiry form completed and key identified stakeholders/ operators contacted.
	Lumen Technologies	Consulted as part of exercise	Responded with no objection
	MET Office	Reviewed the Met Office Safeguarding maps. The development is not sited within any of their meteorological radio facilities safeguarding areas. ¹⁸	No action required
	MLL	Consulted as part of exercise	No response
	Mobile Broadband Network Limited	Consulted as part of exercise	Responded with no objection

¹⁷ Linesearch Before U Dig (2025). Online enquiry service (Online) Available at: <https://lsbud.co.uk/> (Accessed June 2026).

¹⁸ Met Office (2025). Safeguarding Maps (Online) Available at: <https://www.metoffice.gov.uk/services/business-industry/energy/safeguarding> (Accessed June 2026).

Issue raised	Consultee	Consideration	How addressed in this Draft ES
	(Three, Orange and T-Mobile)		
	National Grid Energy Distribution	Consulted as part of exercise	A number of overhead lines were identified within or close by to the Proposed Development. Ongoing discussions are being undertaken with the operator to understand options for mitigation.
	O2	Consulted as part of exercise	No response
	Ofcom	Reviewed Ofcom Spectrum Information System ¹⁹ to identify potential affected links.	Links identified and operators contacted as part of the stakeholder consultation exercise.
	Sota	Consulted as part of exercise	Responded with no objection
	Utility assets Ltd	Consulted as part of exercise	No direct response. However, an automatic response email stated they would only respond if assets were identified.
	Verizon Business	Consulted as part of exercise	Responded with no objection
	Virgin Media	Consulted as part of exercise	No response
	Vodafone	Consulted as part of exercise	Responded with no objection
	Wales and West Utilities	Consulted as part of exercise	No identified infrastructure in Study Area.
	Welsh Water	Consulted as part of exercise	Responded as part of the Scoping Response. They responded with no objection and site maps they have provided indicate that no infrastructure is present. However, they did highlight "... <i>that some public sewers, lateral drains and watermains may not be recorded on our maps. Public sewers may not be</i>

¹⁹OFCOM Spectrum Information System, <https://www.ofcom.org.uk/spectrum/frequencies/spectrum-information-system-sis> (Accessed June 2026)

Issue raised	Consultee	Consideration	How addressed in this Draft ES
			<i>recorded on our maps because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011."</i> Additionally, they responded that there would be no impact on their Telemetry Services.
Aviation	Cardiff Airport (NATS provide the ATC services at the airport)	As part of the Wind Farm Aviation Safeguarding Ltd (WFAS) assessment the radar, and potential effects, was considered.	The WFAS assessment determined that the Proposed Development could be visible to the radar at Cardiff Airport and which would need to be the subject of consultation and discussion with the airport operator. In their response to Scoping (email 03 March 2026), the airport has stated a requirement for the effects to be assessed by a NATS TOPA. This will be the subject of ongoing consultation with Cardiff and NATS.
	Ministry of Defence (MoD) (MoD queries are handled by the Defence Infrastructure Organisation (DIO))	An independent assessment was undertaken by an independent aviation consultant, Wind Farm Aviation Safeguarding Ltd.	The assessment has determined that there should be no significant effects on MoD operations but highlighted the need for MoD compliant infra-red lighting. A lighting assessment will be produced to address the DIO concerns as a physical obstruction to low flying and will be submitted with the final ES.
	NATS	As part of the WFAS assessment	No significant effects on NATS Enroute operations.

Issue raised	Consultee	Consideration	How addressed in this Draft ES
		they analysed NATS Enroute infrastructure and determined that there would be no significant effects on NATS Enroute operations. This has been verified by the NATS response to Scoping (email 23 March 2026). However, as part of the Cardiff Airport response NATS will continue to be consulted on NATS airport services at Cardiff.	NATS airport services, see Cardiff Airport response.

- 16.3.5. Technical engagement with consultees in relation to Telecommunications and Utilities is ongoing at the time of writing this Draft ES.
- 16.3.6. Technical engagement with consultees in relation to Aviation is ongoing at the time of writing this Draft ES.
- 16.3.7. Consultation will continue with the affected aviation stakeholders to identify and progress mitigation measures for each anticipated effect and will be reported in the Final ES.

16.4 Data gathering methodology

Study area

- 16.4.1. Due to the nature of aviation, telecommunications and utilities, impacts are based on the locations, blade tip height, hub height and rotor diameter of the proposed wind turbines as illustrated on **Figure 4.2**.
- 16.4.2. Additionally, the aviation Study Area and assessment has been determined by, and is dependent on, the maximum operating ranges of each of the radar systems scoped into the assessment. The operational range of the radar system is dependent on the function of the radar, the operational requirement of the radar and on the type of radar used. The ranges of those radars and, subsequently, the topic-specific Study Area will vary depending on the technical specification of each radar system and, possibly, between different installations of the same system. The same factors apply to other aviation infrastructure (radios/beacons).

CAP 764²⁰ provides criteria for initial guidance in assessing whether any wind turbine development might have an impact on civil aerodrome related operations.

- 16.4.3. Taken collectively, the reference and guidance sources establish that the following distances inform the size of the Study Area and have been adopted in undertaking this assessment:
- Officially safeguarded aerodromes and aerodromes with a surveillance radar facility need to be consulted if the proposed wind turbines are within 30 km;
 - Within airspace coincidental with any published Instrument Flight Procedure (IFP) to take into account the aerodrome's requirement to protect its IFPs;
 - Consultation with the operators of officially safeguarded technical sites is required if the proposed wind turbines are within 10 km;
 - Further assessment and/or consultation will be required if turbines are planned within:
 - 17 km of a licensed aerodrome within a runway of 1,100 m or more;
 - 5 km of a licensed aerodrome with a runway of less than 1,100 m;
 - 4 km of an unlicensed aerodrome with a runway of more than 800 m; and/or
 - 3 km of an unlicensed aerodrome with a runway of less than 800 m.
- 16.4.4. CAP 764 goes on to state that these distances are for guidance purposes only and do not represent the radar/safeguarding range beyond which all wind turbine developments will be approved or within which they will always be objected to. These quoted ranges are intended as a prompt for further discussion between developers and aviation stakeholders.
- 16.4.5. The maximum study area has, therefore, been informed by the operational ranges of all of the civil airport radars, military ATC and ADR radars, NATS radars, and Met Office Radars, that have the capability of surveilling the airspace at the Development Site.

Ministry of Defence

- 16.4.6. It is necessary to take into account the aviation and air defence activities of the MoD. The issues that will be assessed include the potential effect of the Proposed Development on:
- MoD Airfields, both radar and non-radar equipped;
 - MoD remote air traffic control (ATC) radars;
 - MoD Air Defence Radars (ADR);
 - Military Aviation Authority Aerodrome Design and Safeguarding; and
 - Military Low Flying.

NATS

- 16.4.7. It is necessary to take into account the possible effects of wind turbines upon NATS radar systems, a network of primary and secondary radars and navigation facilities around the country.

²⁰ See **Error! Reference source not found.** for a brief description of the guidance

Meteorological Office

- 16.4.8. The UK Met Office maintain a network of radars around the country to assist in weather prediction.
- 16.4.9. Taken collectively the various radars (civil airport radars, NATS radars, military ATC and ADR radars and Met radars), the radar types and ranges have determined the maximum study area.

Desk Study

- 16.4.10. A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 16.7**.

Table 16.7 Data sources used to inform the Aviation and Radar assessment

Organisation	Data source	Data provided
NATS	UK Integrated Aeronautical Information Package (IAIP)	Uk Airspace Structure
CAA/NATS	UK Airspace Charts (1:250,000 and 1:500,000)	UK Airspace Structure
MoD	UK Military AIP	Military aviation infrastructure
OfCom	Protected radar list	Safeguarded radar infrastructure
WFAS	Review' Version 5 Radar Modelling Software	Radar Line of Sight values

16.5 Overall baseline

Current baseline

Aviation and Radar

- 16.5.1. The Proposed Development lies within unrestricted airspace (Class G) but has radar line of sight to the radar at Cardiff Airport and is within Low Flying Area (LFA) 7, a military low flying training area.

Telecommunications and Utilities

- 16.5.2. A microwave link was identified in crossing the Southern Array operated by Airwaves.
- 16.5.3. A number of overhead lines were identified that either cross or pass near both the northern and southern arrays of the Proposed Development. No other utilities have been identified.

Future baseline

- 16.5.4. Airspace changes are protracted procedures and take years to implement. There are no known planned changes in the area in the timeline of the Proposed Development.

- 16.5.5. On the basis of the information currently available in relation to telecommunications and utilities, no changes to the baseline conditions are anticipated in the event that the Proposed Development does not proceed.

16.6 Embedded measures

- 16.6.1. A range of environmental measures have been embedded into the Proposed Development as outlined in **Chapter 4: Development Description. Table 16.8** outlines how these embedded measures will influence the Aviation, Telecommunications and Utilities assessment.

Table 16.8 Summary of the embedded environmental measures

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
Construction			
Aviation - Military Low Flying	Tall objects can represent a vertical obstacle to flight and, potentially, pose a flight safety risk.	To facilitate safe flight, day or night, there are regulations governing the procedures that must be followed to ensure the timely dissemination of information regarding the construction of anemometer masts and wind turbines. Information regarding construction of the Proposed Development will be passed to the Defence Geographical Centre (DGC) and the General Aviation Awareness Council (GAAC) in advance of the commencement of turbine construction and then be updated regarding location, height and lighting type. Information will then be promulgated within the civil UK Integrated Aeronautical Information Package (UK IAIP), the main resource for information for all of the UK airspace, as well as the Military	DNS Condition

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
		Aeronautical Information Publications.	
Telecommunications	Interference with microwave fixed link	If highlighted by operator, then mitigation options would be investigated such as micrositing or other technical solutions. A 50m micrositing allowance has been requested to mitigate potential interference.	Telecommunications
Operation			
Aviation - Military Low Flying	Potential obstacles for MoD low flying exercises	Aviation lighting, including MoD compliant infra-red lighting will be fitted on the Proposed Development	DNS condition
Aviation – Cardiff Airport	Potential visibility on the airport radar	Mitigation options to be discussed with NATS	DNS condition
Telecommunications	Interference with microwave fixed link	If highlighted by operator, then mitigation options would be investigated such as micrositing or other technical solutions. A 50m micrositing allowance has been requested to mitigate potential interference.	DNS condition

16.7 Scope of the assessment

Overview

- 16.7.1. The scope of the following aviation assessment is based upon a review of the policy guidance and baseline information detailed in **Section 16.2**.

Aviation and Radar

- 16.7.2. The aviation assessment has considered the likely aviation and radar effects that might result from line-of-sight between the turbines and the radar covering the area.
- 16.7.3. Algorithms within radar systems are established to prevent static objects being detected and to ensure that only moving objects are presented to the controllers' screens. During the

construction phase, the blades will be static and will not be detected. There is a well-established procedure for the dissemination of information relating to construction and considered essential for the safety of flying operations, both civil and military, to allow such aviation operations to be planned and to continue accordingly. The construction activities, when conducted in accordance with mandated procedure, will not pose a risk to aviation and there should be no effect; construction activities can be scoped out from further consideration within aviation.

- 16.7.4. There is a well-established procedure for the dissemination of information relating to de-construction and considered essential for the safety of flying operations, both civil and military, to allow such aviation operations to be planned and to continue accordingly. The decommissioning activities, when conducted in accordance with mandated procedure, will not pose a risk to aviation and there should be no effect; the inherent embedded mitigation means that de-construction activities can be scoped out from further consideration within aviation.
- 16.7.5. There are no non-radar equipped licensed aerodromes within the recommended consultation distance, and these can be scoped out from further consideration.
- 16.7.6. There are no unlicensed aerodromes, hang-gliding sites or glider sites within the stipulated consultation distances and these can be scoped out from further consideration.

Telecommunications and Utilities

- 16.7.7. The telecommunications and utilities assessment considers electromagnetic interference with telecommunications, and impacts on underground and overground utilities within the Development Site.

Spatial Scope

- 16.7.8. The spatial scope of the assessment of Aviation, Radar, Telecommunications and Utilities covers the area of the Proposed Development contained within the Development Site, together with the Zones of Influence (Zols) that have formed the basis of the Study Area described in **Section 16.4**.
- 16.7.9. The aviation assessment study area is dependent on the maximum operating ranges of any radars capable of covering the airspace above the Proposed Development.

Temporal Scope

- 16.7.10. Aviation, Radar, Telecommunications and Utilities is primarily an operational effect of the wind farm. Therefore, the temporal scope of the assessment of Aviation, Radar and Telecommunications covers the operational period of the wind farm.
- 16.7.11. The only potential effect during construction or decommissioning will be the presence of large cranes. The Applicant will be required to inform identified Aviation, Radar and Telecommunications stakeholders of large crane activity. Standard aviation lighting for cranes in excess of 150 metres will be required.

Potential Receptors

- 16.7.12. At the time of writing this Draft ES, in relation to utilities, overhead lines have been identified that cross areas of the Development Site (in the Southern Array), however no other utilities potential receptors have been identified through consultation with operators. In relation to telecommunications, Airwaves have identified potential impacts on one of their microwave links, however no other operator has highlighted any potential impacts.
- 16.7.13. The potential aviation and radar receptors that were considered are detailed in **Table 16.9**.

Likely significant effects

- 16.7.14. The principal Aviation and Radar receptors that have been identified as being potentially subject to effects and have been taken forward for further assessment are summarised in **Table 16.9**.

Table 16.9 Aviation and Radar receptors subject to potential effects

Receptor	Reason for consideration
Military low flying	The turbines could represent a physical obstruction to low flying.
Cardiff Airport radar	Potential interference on the radar

- 16.7.15. The receptors detailed in **Table 16.10** have been scoped out from being subject to further assessment because there are none within the stipulated consultation distance or radar modelling demonstrates that there would be no potential for effects.

Table 16.10 Summary of effects scoped out of the Aviation and Radar assessment

Receptors/potential effects	Justification
NATS Enroute radars	Radar modelling demonstrated that there were none that could be affected and which was verified in the NATS response to Scoping.
Licensed civil airport (non-radar)	None within the stipulated consultation distance.
Unlicensed Airport, Gliding sites, Hang-gliding and parachute sites	None within the stipulated consultation distance (although it should be noted that such sites can be establish at fairly short notice).
Military Air Traffic Control radar	Radar modelling demonstrated that there were none that could be affected and none listed within the DIO response to PEDW.
Military Air Defence Radar	Radar modelling demonstrated that there were none that could be affected and none within the DIO response to PEDW.
Met Office radars	None within the stipulated consultation distance.

Telecommunications and Utilities

- 16.7.16. The effects on Telecommunications receptors include electronic interference or disruption to services. Technical solutions to any infrastructural constraint will be sought during this process to minimise effects upon it.

- 16.7.17. The effects on Utilities receptors include physical impacts from positioning of Proposed Development infrastructure. Technical solutions to any infrastructural constraint will be sought during this process to minimise effects upon it.

16.8 Assessment methodology

- 16.8.1. The generic project-wide approach to the assessment methodology is set out in **Chapter 2: Approach to EIA**. However, whilst this has informed the approach that has been used in this Aviation and Radar assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this Aviation and Radar assessment.

Aviation and Radar

- 16.8.2. Radar modelling has been undertaken using the “RView” system which utilises a comprehensive systems database incorporating the safeguarding criteria for a wide range of radar and radio navigation systems. RView models terrain using the latest Ordnance Survey (OS) Terrain 50 digital terrain model, which has a post spacing of 50m and has a root mean square (RMS) error of 4m. The results are verified using the Shuttle Radar Topography Mission (SRTM) dataset, a separate smoothed digital terrain model with data spacing of 3 arc seconds. By using two separate and independently generated digital terrain models, anomalies are identified and consistent results assured. RView models the refractive effects of the atmosphere on radio waves and the First Fresnel Zone. If needed, RView is also capable of modelling a range of atmospheric refractive conditions. RView models the trajectory of radar signals at different elevations enabling modelling of both volume surveillance and pencil beam radars as well as the effects of angular sterilisation as applied, for example, in Met Office radars.

Telecommunications and Utilities

- 16.8.3. The basis of the assessment has been to consult with a number of organisations known to have an interest within the areas stated in the scope. The consultation list was drawn together based on advice given in TAN 8.
- 16.8.4. The risk of impacts on telecommunications and utilities has been assessed through consultation with the relevant organisations. The consultation list was drawn together based on identifying the local telecommunication bodies, other relevant parties identified by Spectrum Licensing (Ofcom) and Linesearch before you dig.

Significance evaluation methodology

Aviation

- 16.8.5. There is no agreed or mandated definition of significance when assessing development proposals for wind farms in relation to aviation. Whilst technical effects on communications, navigation and surveillance (CNS) systems are relatively simple to identify and evaluate, operational and flight safety effects can be subjective and are often challenged by third parties. It is sufficient in this context to identify any technical effects and then, taking into

account the statements in CAP 764 regarding the status of aviation stakeholders, in general to accept the judgement of those stakeholders in assessing the significance of the effects.

- 16.8.6. Therefore, it is not considered to be appropriate for the Applicant to make an assessment of the significance of an effect in relation to aviation interests. Also, it is often the case that different Air Navigation Service Providers (ANSP) take a different view of the same scenario and may disagree with the assessment findings; this can require further post submission consultation, to confirm the findings of the assessment and/or agree to the need for and extent of mitigation. Therefore, this assessment does not make a judgement of significance but is focussed on identifying potential impacts and agreeing mitigation with aviation stakeholders as required.

Telecommunications and Utilities

- 16.8.7. The impacts on Telecommunications and Utilities and significance from the Proposed Development is identified and determined in consultation with the infrastructure operators and stakeholders. If they identify an impact of significance to their operations, then mitigation options will be explored and agreed.

16.9 Assessment of Aviation, Telecommunications and Utilities effects

Predicted effects: Operation

- 16.9.1. Aviation Radar modelling analysis undertaken has provided the line-of-sight results for the Cardiff International Airport radar presented in **Table 16.11**.

Table 16.11 Radar line-of-sight results for the Cardiff International Airport radar

Turbine	Radar line-of-sight (metres above ground level)
1	20.9
2	0.0
3	0.0
4	0.0
5	22.2
6	30.9
7	0.0
8	14.1

- 16.9.2. The results show that every turbine will be visible to the radars at Cardiff and, therefore, there is the potential that the Proposed Development could affect the airport's operations. Therefore, mitigation options will be required to be discussed with Cardiff Airport and NATS (they provide management services for the airports airspace).

Telecommunication and Utilities

- 16.9.3. Airwaves have identified a link running through the Southern Array of the Proposed Development. They have initially objected based on their initial screening criteria; therefore, a detailed assessment has been requested that could show that there is no impact. However, if the detailed assessment indicates an impact, then discussions with Airwaves in relation to mitigation options would be held.
- 16.9.4. Overhead lines have been identified that cross areas of the proposed development. Discussions are ongoing with National Grid Energy Distribution to agree mitigation.
- 16.9.5. If a reduction in television reception quality occurs in the surrounding area, it is most likely to be noticed when the proposed wind farm becomes operational. Should planning permission be granted and to mitigate any problems with reception arising, the developer would assess current television signals in advance of development and mitigate post-development problems to television reception arising where effects are attributable to the proposed wind farm. Consultation suggests adverse effects may not occur and that in the unlikely event that interference does occur, this would be localised. This could be controlled by planning condition that would require the developer to meet the cost of investigating and effectively rectifying any problems should they arise and to implement solutions in a timely manner so as to minimise any inconvenience to residents.
- 16.9.6. Viewing quality can be improved by considering each or a combination of the following mitigation techniques:
- replace or upgrade the receiving aerials (e.g. with directional receiving aerials) for affected households;
 - re-tune the television receivers at affected households;
 - re-align the television aerial to an alternative transmitter and re-tune the receiver at affected households; and
 - provision of a bespoke 'self-help' solution (this could comprise a new low powered transmitter, a cable network, broadband television services such as Freely, a satellite receiver, or a combination of these measures).
- 16.9.7. Based on the current consultation response from Utilities operators no effects have been identified.

16.10 Assessment of cumulative (inter-project) effects

- 16.10.1. A cumulative effects assessment (CEA) has been undertaken for the Proposed Development which considers the combined impacts with other developments on the same single receptor or resource (inter-project effects). The detailed method followed in identifying and assessing potential cumulative effects is set out in **Chapter 2: Approach to EIA**.
- 16.10.2. The proposed turbines would potentially be visible on the Cardiff Airport radar. Consultation will continue to agree a technical approach and a planning condition that would mitigate radar impacts.
- 16.10.3. The MoD have highlighted that there may be a requirement for aviation lighting. An aviation lighting scheme will be prepared and submitted with the final ES, which should address the MoD concerns.

- 16.10.4. With mitigation agreed on the Cardiff Airport radar, and an acceptable lighting scheme agreed with the MoD, then the Proposed Development should not result in any technical or operational effects and cannot, therefore, contribute to any cumulative aviation effects.
- 16.10.5. Any telecommunications and utilities effects would be limited to the Site and therefore cumulative effects with other developments would not arise.

16.11 Summary of effects

- 16.11.1. The degradation of microwave and other electromagnetic signals has been identified as much as possible as a result of consultation with stakeholders.
- 16.11.2. The Applicant is prepared to resolve any such problems should they arise as a result of construction and operation of the wind farm on Aviation, Telecommunication and Utilities. Discussions will be undertaken to agree a technical approach and planning condition(s) that would mitigate any identified impacts.
- 16.11.3. Potential effects on Cardiff International Airport Radar, and the UK Low Flying System have been identified through the radar modelling. However, discussions are ongoing to agree a technical approach and a planning condition that would mitigate radar impacts.

16.12 Further work to be undertaken

- 16.12.1. The information provided in this Draft ES will be updated and a final assessment of likely significant effects will be reported in the Final ES. This section describes the further work to be undertaken to support the Aviation and Radar assessment presented in the ES.
- 16.12.2. Further consultation with NATS/Cardiff Airport will be undertaken. The results of this consultation, and any measures agreed to mitigate effects on radar, will be made available and reported in the Final ES.
- 16.12.3. The aviation lighting scheme will be undertaken and consultation undertaken with the CAA and the MoD for their approval of the proposed lighting scheme.
- 16.12.4. Further discussions with any telecommunications and utilities operators that highlight any impacts will be undertaken to mitigate any effects on microwave links if required; this information will be made available to consider with the application if needed and once an agreed approach has been finalised.
- 16.12.5. Discussions with Airwave Solutions Limited in relation to technical mitigation to avoid potential impacts on the microwave links will be undertaken and the results reported in the Final ES.