Contents

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

16.1 Introduction

16.1.1. 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.

16.1.2. This chapter presents the assessment of the likely significant effects of the Proposed Development with respect to Aviation, Radar, Telecommunications, and Utilities.

16.1.3. The preliminary 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 preliminary assessment of Aviation, Telecommunications and Utilities effects (**Section 16.9**);
- preliminary assessment of cumulative (inter-project) effects (**Section 16.10**);
- a summary of the preliminary significance conclusions (**Section 16.11**);
- an outline of further work to be undertaken for the Final ES (**Section 16.12**).

Limitations and assumptions

16.1.5. The information provided in this Draft ES is preliminary, the final assessment of likely significant Noise and Vibration effects will be reported in the Final ES. This Draft ES has been produced to fulfil the Applicants Pre-Application Consultation (PAC) responsibilities and enable consultees to develop an informed view of the likely significant effects of the Proposed Development based on latest current information.

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 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 and Telecommunications. Further information on policies relevant to the Proposed Development is provided in **Chapter 5: Legislation and policy overview**.

Aviation

16.2.2. Planning and legislative context. 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

Policy	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: *"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);"*
Technical Advice Note (TAN) 8: Planning for Renewable Energy (2005) [2] **(revoked however used as a guide for this assessment)**	Paragraph 2.35 states: *"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 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."* Paragraph 2.36 states: *"Lights are only required on structures that are over 150 m high."* Paragraph 2.38 states: *"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,*

[1] Welsh Government (2021). Future Wales: the national plan 2040. (Online) Available at: https://gov.wales/future-wales-national-plan-2040 (Accessed September 2025).
[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 September 2025).

Policy	Context
	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." 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	
Caerphilly County Borough Local Development Plan up to 2021[3]	With respect to Aviation, there is no content.
Torfaen County Local Development Plan up to 2021 [4] **(adopted December 2013)**	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.**

Table 16-2 Technical guidance relevant to the aviation assessment.

Technical guidance document	Context
Civil Aviation Publication (CAP) 764 Civil Aviation Authority (CAA) Policy and Guidance on Wind Turbines	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.
CAP 670 Air Traffic Services Safety Requirements	The document defines the safeguarding requirements for safeguarding of Communications, Navigation and Surveillance (CNS) equipment in aviation.
CAP 393 The Air Navigation Order 2016 and Regulation	The document outlines the Regulations for Aircraft airworthiness, operation and certification, requirements for air crew, passengers, and cargo, Air traffic services, Aerodromes etc.
CAP 168 Licensing of Aerodromes	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.
CAP 774 UK Flight Information Services	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

[3] Caerphilly County Borough Local Development Plan up to 2021 (adopted 2010) (Online) Available at: https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx (Accessed September 2025).
[4] Torfaen County Borough Council (2013) Torfaen County Borough Council Local Development Plan. (Online) Available at: https://www.torfaen.gov.uk/en/Related-Documents/Forward-Planning/Adopted-Torfaen-LDP-Writen-Statement.pdf (Accessed September 2025).

Technical guidance document	Context
	applicable to all civilian and military pilots, air traffic controllers, and flight information service officers.
CAP 738 Safeguarding of Aerodromes	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.
CAP 793 Safe Operating Practices at Unlicensed Aerodromes	Provides guidance on the recommended layout, physical characteristics and visual aids appropriate to safe operating practices at unlicensed aerodromes.
CAP 493 Manual of Air Traffic Services	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 also be of general interest to others associated with civil aviation.
CAP 1096 Guidance to Crane Users on aviation lighting and notification	Provides guidance to crane users on the crane notification process and lighting and marking requirements applicable to cranes.
UK Aeronautical Information Publications (AIP)	Detailed official source of information vital for air navigation, updated every 28 days, and structured into En-Route and Aerodrome information.
Military Aviation Authority Traffic Management (3000 series) Regulatory Articles	The Military Regulations provide the framework of policy, rules, directives, standards, processes and the associated direction, advice and guidance, which governs military aviation activity and against which air safety is assessed.
Military Aviation Authority Regulatory Article 2330 (Low Flying)	The Military Regulations provide the framework of policy, rules, directives, standards, processes and the associated direction, advice and guidance, which governs military aviation activity and against which air safety is assessed.
UK Military Aeronautical Information Publication (MIL AIP)	The military equivalent of the civil AIP (ABOVE).
NATS 1:250,000 and 1:500,000 VFR Charts	Continually updated aeronautical charts of the UK.
Safeguarding aerodromes, technical sites and military explosives storage areas, DfT/ODPM circular 2003.	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.

Telecommunications and Utilities

16.2.4. Planning and legislative context A summary of the 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.

Policy	Context
National planning policy	
Future Wales: The National Plan 2040[1]	**This states that these types of DNS will be permitted subject to: *"Policy 18 – Renewable and Low Carbon Energy Developments of National Significance"* And** criterion:***"7. there are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance;"***
Technical Advice Note 8: Planning for Renewable Energy[2] (TAN8) Paras 2.29-2.30 (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. 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.*" 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	
Caerphilly County Borough Local Development Plan up to 2021[5]	**With respect to Telecommunications and Utilities, there is no content.**
Torfaen County Local Development Plan up to 2021 [6] (adopted December 2013)	**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	
Practice Guidance – Planning Implications of Renewable and Low	The assessment will take due cognisance of the following paragraphs from the guidance document:

[5] Caerphilly County Borough Local Development Plan up to 2021 (adopted 2010) (Online) Available at: https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx (Accessed September 2025).
[6] Torfaen County Borough Council (2013) Torfaen County Borough Council Local Development Plan. (Online) Available at: https://www.torfaen.gov.uk/en/Related-Documents/Forward-Planning/Adopted-Torfaen-LDP-Writen-Statement.pdf (Accessed September 2025).

Technical guidance document	
Carbon Energy.[7] Welsh Assembly Government (2011). Para 3.4.24-3.4.26	*"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 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 – 1.0km (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.* *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 5km from the turbines. Terrestrial television transmissions for domestic reception within the UK are the joint responsibility of the BBC and Ofcom.* *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 100m 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."*

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 **Section 2.4** of **Chapter 2: Approach to Environmental Impact Assessment**

Scoping Opinion

16.3.2. A Scoping Direction was issued by the Planning and Environmental Decisions Wales (PEDW, formerly Planning Inspectorate Wales), on behalf of the Welsh Ministers, on 04 December 2024 (reference DNS CAS-03701-H3V4Y3: Rhyswg Wind Farm). A summary of the relevant responses received in the Scoping Opinion in relation to Aviation and Telecommunications and confirmation of how these have been addressed within the assessment to date is presented in **Table 16-5**.

[7] 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 September 2024).

16.3.3. **Table 16-5** outlines the comments made in the Scoping Direction in relation to Aviation, Telecommunications and Utilities and how these have been addressed within this Draft ES.

16.3.4. The information provided in the Draft ES is preliminary and not all the Scoping Direction comments have been addressed at this stage. However, all comments will be addressed within the Final ES along with any additional comments raised during PAC.

Table 16-5 Summary of EIA Scoping Direction Responses for Aviation, Telecommunications and Utilities

Consultee	Consideration	How addressed in this Draft ES
PEDW	**The applicant's attention is drawn to comments from NATS, DIO and Cardiff Airport at appendix 1, within which it is noted that the site falls within a safeguarding zone. The applicant should consult with relevant bodies on potential impacts and mitigation measures such as aviation lighting. The assessment of impact should be set out in the ES.**	**An aviation consultant has undertaken analysis and is consulting with NATS, DIO and Cardiff Airport as to appropriate mitigation, see Table 16-6.**
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

16.3.5. 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	No response
	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	Responded with no objection
	Colt	Consulted as part of exercise	Responded with no objection
	CSS Spectrum Management Services Ltd	Consulted as part of exercise	No response

Issue raised	Consultee	Consideration	How addressed in this Draft ES
	GTC	Consulted as part of exercise	No response
	JRC Spectrum Management	Consulted as part of exercise	Responded initially with an objection based on their initial screening analysis. Therefore, a request for a detailed impact analysis study from JRC is being requested to understand whether the turbine will impact on their links.
	Linesearch Before U Dig[8]	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.[9]	No action required
	MLL	Consulted as part of exercise	Responded with no objection
	Mobile Broadband Network Limited (Three, Orange and T-Mobile)	Consulted as part of exercise	Responded with no objection
	National Grid Energy Distribution	Consulted as part of exercise	No identified infrastructure in Study Area.
	O2	Consulted as part of exercise	No response
	Ofcom	Reviewed Ofcom Spectrum Information System[10] to identify potential affected links.	No links identified.
	Sota	Consulted as part of exercise	Responded with no objection
	Utility assets Ltd	Consulted as part of exercise	No response
	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

[8] Linesearch Before U Dig (2025). Online enquiry service (Online) Available at: https://lsbud.co.uk/ (Accessed September 2025).
[9] Met Office (2025). Safeguarding Maps (Online) Available at: https://www.metoffice.gov.uk/services/business-industry/energy/safeguarding (Accessed September 2025).
[10] OFCOM Spectrum Information System, https://www.ofcom.org.uk/spectrum/frequencies/spectrum-information-system-sis (Accessed September 2025)

Issue raised	Consultee	Consideration	How addressed in this Draft ES
	Wales and West Utilities	Consulted as part of exercise	No identified infrastructure in Study Area.
	Welsh Water	Consulted as part of exercise	No response
Aviation	Cardiff International Airport (dated 15 October 2024)	Predicted effects on the airport radar and the airport operations which utilise the radar.	The airport operators have objected on the grounds of potential effects on the radar. Mitigation will need to be identified and agreed. Consultation with the airport operators and NATS, as provider of the ATC services, will continue regarding the availability of a technical mitigation solution. Such a solution will not be determined in advance of confirmation of the final locations and the tip height of the proposed turbines.
	Ministry of Defence (Defence Infrastructure Organisation (dated 17 October 2024)	Predicted effects of the development as a physical barrier to low flying aircraft.	The MoD have objected on the grounds that the turbines will represent a physical obstruction to low flying. Mitigation will need to be identified and agreed. When the final locations and the tip height of the proposed turbines have been determined it will be possible to conduct an Aviation Lighting Assessment which will provide mitigation for the effects. This will be included in the Final ES.
	National Air Traffic Services (dated 11 October 2024)	Predicted on the Clee Hill radar and the NATS operations which utilise the radar.	NATS have objected on the grounds of potential effects on the radar. Mitigation will need to be identified and agreed. Consultation will continue with NATS will continue regarding the availability of a technical mitigation solution. Such a solution will not be determined in advance of confirmation of the actual locations and the tip height.

16.3.6. Technical engagement with consultees in relation to Telecommunications and Utilities is ongoing at the time of writing this Draft ES.

16.3.7. Technical engagement with consultees in relation to Aviation is ongoing at the time of writing this Draft ES.

16.3.8. 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 4.1.**

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 764[11] 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 30km;
- 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 10km;
- Further assessment and/or consultation will be required if turbines are planned within:
    - 17km of a licensed aerodrome within a runway of 1100m or more;
    - 5km of a licensed aerodrome with a runway of less than 1100m;
    - 4km of an unlicensed aerodrome with a runway of more than 800m; and/or
    - 3km of an unlicensed aerodrome with a runway of less than 800m.

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.

[11] See Table 16-2 for a brief description of the guidance

16.4.5. It is also necessary to consider the operations of the Ministry of Defence including:

- Ministry of Defence Airfields (radar and non-radar equipped);
- Ministry of Defence Remote Air Traffic Control Radars;
- Ministry of Defence Air Defence Radars;
- Ministry of Defence Low Flying; and
- Ministry of Defence Meteorological Radars.

16.4.6. The Ministry of Defence does not stipulate consultation distances for their radars.

16.4.7. It has also been necessary to take into account the possible effects of wind turbines upon the National Air Traffic Services (NATS) radar systems – a network of primary and secondary radars and navigation facilities around the country.

16.4.8. 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.

16.5 Overall baseline

Current baseline

16.5.1. The Proposed Development is in Class G airspace, the least regulated, but is underneath the Cardiff International Airport Control Area (CTA) which starts at 5,500ft and extends upwards to FL75 (approximately 7,500ft) and above which is the Cotswold CTA. The Cardiff airspace is annotated as Class D. Class D airspace is normally established around qualifying airports and aircraft may not enter Class D airspace unless they have Air Traffic Control clearance to do so, if it is not radio equipped and unless special clearance to enter the airspace (subject to specified times, altitudes, routes, etc) has been issued by the controlling authority, in this instance Cardiff or Bristol International Airports

16.5.2. A number of microwave links were identified in the wider area, including three links operated by JRC.

Future baseline

16.5.3. 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.

16.5.4. 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 **Section 3.4. Table 16-7** outlines how these embedded measures will influence the Aviation, Telecommunications and Utilities assessment.

Table 16-7 Summary of the embedded environmental measures

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
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 planning condition**
Aviation	**Potential obstacles for MoD low flying exercises**	**MoD may request aviation lighting to ensure turbines visible at night to their aircraft.**	**DNS planning condition**
	Potential visibility on Cardiff Airport ATC radar	**Options to be discussed with Cardiff Airport. For example, a number of other wind farm developers are in discussion with Cardiff Airport about funding the provision of a radar upgrade, which would enable operation of wind farms without radar interference.**	**DNS planning condition**
	Potential visibility on Clee Hill NERL radar	**Options to be discussed with NERL.**	**DNS planning condition**

16.7 Scope of the assessment

The Proposed Development

16.7.1. The scope of the assessment has been derived from policy guidance and Scoping Direction discussed in **Table 16-2** and **Table 16-4.**

Aviation

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 EIA Assessment Area.

Spatial Scope

16.7.8. The spatial scope of the assessment of Aviation, Telecommunications and Utilities covers the area of the Proposed Development contained within the EIA Assessment Area, together with the Zones of Influence (ZoIs) that have formed the basis of the study area described in **Section 16.4**.

Temporal Scope

16.7.9. Aviation and Telecommunications is an operational effect of the wind farm and is not present during construction or decommissioning. Therefore, the temporal scope of the assessment of Aviation and Telecommunications covers the operational period of the wind farm, which is 30 years.

16.7.10. At the time of writing this Draft ES, no utilities issues have been identified. However, if identified during construction of wind farm infrastructure these would either be safeguarded by applying appropriate standoffs as defined by the operator or suitable safeguarding mitigation would be implemented in liaison with the operator.

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 Aviation 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, no utilities potential receptors have been identified through consultation with operators. In relation to telecommunications, JRC have identified potential impacts on their microwave links, however no other operator has highlighted any potential impacts. No other operators that have responded have identified any impacts.

16.7.13. The principal Aviation receptors that have been identified as being potentially subject to effects are summarised in **Table 16-8**.

Table 16-8 Aviation receptors subject to potential effects

Receptor	Reason for consideration
NATS Clee Hill radar	**NATS have objected on the grounds of potential effects on the radar. Mitigation will need to be identified and agreed.**
Cardiff International Airport radar	**The airport operators have objected on the grounds of potential effects on the radar. Mitigation will need to be identified and agreed.**
UK Low Flying System	**The MoD have objected on the grounds that the turbines will represent a physical obstruction to low flying. Mitigation will need to be identified and agreed.**

Likely significant effects

16.7.14. The effects on Aviation receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 16-8.**

16.7.15. The effects on Telecommunications and Utilities 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.

16.8 Assessment methodology

16.8.1. The generic project-wide approach to the assessment methodology is set out in **Chapter 2: Approach to Environmental Impact Assessment** and specifically in Section **2.5** to **2.8**. However, whilst this has informed the approach that has been used in this Aviation, Telecommunication and Utilities 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, Telecommunication and Utilities assessment.

Aviation

16.8.2. Radar modelling has been undertaken using specialist propagation prediction software (RView) which has been designed and refined specifically for the task. RView uses a comprehensive systems database which incorporates the safeguarding criteria for a wide range of radar and radio navigation systems and models terrain using the Ordnance Survey (OS) Landform Panorama digital terrain model, which has a post spacing of 50 metres and has a root mean square (RMS) error of 3 metres. 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. RView can perform calculations using the true Earth Radius at the midpoint between the radar and the wind turbine or the simplified 4/3 Earth Radius model.

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

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.

16.9 Preliminary assessment of effects

Predicted effects: Operation

16.9.1. Aviation Radar modelling analysis undertaken confirms the NATS findings of their technical assessment. Initial radar modelling has provided the line-of-sight results for the Clee Hill radar presented in **Table 16-9**.

Table 16-9 Radar line-of-sight results for the Clee Hill radar

Turbine	Radar line-of-sight (metres above ground level)
1	122.6
2	111.7
3	124.3

16.9.2. Radar modelling analysis undertaken has provided the line-of-sight results for the Cardiff International Airport radar presented in **Table 16-10**.

Table 16-10 Radar line-of-sight results for the Cardiff International Airport radar

Turbine	Radar line-of-sight (metres above ground level)
1	8.0
2	4.5
3	16.9

16.9.3. The results show that every turbine will be visible to the radars at Cardiff and at Clee Hill and, therefore, there is the potential that the Proposed Development could affect both the airport's operations and NATS En-Route. Therefore, mitigation options will be required to be discussed with Cardiff Airport and NATS.

Telecommunication and Utilities

16.9.4. JRC have identified three links are close to the Site. 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 JRC in relation to mitigation options would be held.

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, 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 Preliminary assessment of cumulative effects

16.10.1. A preliminary 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 **Section 2.9** of **Chapter 2**.

16.10.2. It is anticipated that the proposed measures discussed in **Table 16-7** would ensure no significant effects on Aviation, Telecommunication and Utilities would arise from the Proposed Development. Any telecommunications and utilities effects would be limited to the Site and therefore cumulative effects with other developments would not arise. With regards to aviation, further discussions are ongoing with NATS. Other developments would need to undergo a similar exercise in avoiding aviation effects. Significant cumulative effects are therefore considered unlikely to occur.

16.11 Preliminary 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 NATS Clee Hill and 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 is preliminary, the final assessment of likely significant effects will be reported in the ES. This section describes the further work to be undertaken to support the Aviation, telecommunications and Utilities assessment presented in the Final ES.

16.12.2. 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.

16.12.3. JRC have initially objected to the proposed development based on impacts to three of their microwave links. Therefore, we have requested a detailed study be undertaken by them to further understand if the links will be impacted by the Proposed Development. If that highlights any effects further discussions 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.

16.12.4. The final turbine layout and tip heights will have to be subjected to radar modelling and an Aviation Lighting Assessment.