

Chapter 15

Aviation and Existing Infrastructure

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Glossary

| Term | Definition |
|--------------------------|--|
| Basic Service | An air traffic service provided to aircraft outside controlled airspace for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility. |
| Controlled airspace | Airspace which requires pilots to obtain a clearance from the controlling authority prior to entry and to comply with controller instructions when within the airspace. |
| Deconfliction Service | An air traffic service provided to aircraft outside controlled airspace in which the radar controller provides the pilot with radar-derived traffic information and issues headings and/or levels aimed at achieving separation from conflicting traffic |
| North section | Section of development located north of Bryn settlement, within Penhydd forestry block. |
| South section | Section of development located south of Bryn settlement, within Bryn forestry block. |
| The proposed development | Y Bryn Wind Farm development. |
| Traffic Service | An air traffic service provided to aircraft outside controlled airspace in which the radar controller provides specific surveillance-derived traffic information to assist the pilot in avoiding other traffic but does not provide headings and/or levels to achieve separation from conflicting traffic |
| Uncontrolled airspace | Airspace within which any aircraft is permitted to fly without obtaining a clearance and without maintaining radio contact with any agency. |
| Y Bryn site boundary | The area within which the proposed development will be located. |

List of Abbreviations

| Abbreviation | Description |
|--------------|--|
| ADLS | Aircraft Detection Lighting System |
| agl | above ground level |
| AIP | Aeronautical Information Publication |
| AMEP | Access Management and Enhancement Plan |
| amsl | above mean sea level |
| ANO | Air Navigation Order |
| ASAC | Airborne Surveillance and Control |
| ATC | Air Traffic Control |
| BCBC | Bridgend County Borough Council |
| BHS | British Horse Society |
| CAA | Civil Aviation Authority |
| CAP | Civil Aviation Publication |
| CB | Citizen's Band |
| CFAR | Constant False Alarm Rate |

| Abbreviation | Description |
|---------------|---|
| CRoW | Countryside and Rights of Way |
| DNS | Developments of National Significance |
| EIA | Environmental Impact Assessment |
| ES | Environmental Statement |
| FIR | Flight Information Region |
| FL | Flight Level |
| ICAO | International Civil Aviation Organisation |
| IFR | Instrument Flight Rules |
| km | kilometres |
| LARS | Lower Airspace Radar Service |
| LDF | Long Distance Footpath |
| LDP | Local Development Plan |
| LFA | Low Flying Area |
| LPA | Local Planning Authority |
| m | metres |
| MoD | Ministry of Defence |
| NATS | (formerly) National Air Traffic Services |
| Natural Power | Natural Power Consultants Ltd |
| NPTCBC | Neath Port Talbot County Borough Council |
| NERL | NATS en route |
| nm | nautical miles |
| NRR | Night Rotary Region |
| NRR7S | Night Rotary Region 7 South |
| NRW | Natural Resources Wales |
| PPW | Planning Policy Wales |
| PRoW | Public Rights of Way |
| PSR | Primary Surveillance Radar |
| PWS | Private Water Supply |
| RAYNET | Radio Amateurs Emergency Network |
| RN | Royal Navy |
| RNAS | Royal Naval Air Station |
| TRA | Temporary Reserved Airspace |
| TTA | Tactical Training Area |
| UWAS | Universities of Wales Air Squadron |
| VFR | Visual Flight Rules |

15.1 INTRODUCTION

- 15.1.1 This chapter details the baseline environment; the methods used for assessing the potential impact of the proposed Y Bryn Wind Farm (proposed development) on aviation and existing infrastructure; and the conclusions of those assessments.
- 15.1.2 In terms of aviation, consideration is given to the potential impact on civil and military aviation interests and this section of the chapter has been compiled by Gladhouse Planning Ltd (trading as Aviatica). Micrositing is considered in this assessment and would result in no change to the conclusions on significance of effects. The future aviation baseline has also been considered. It is assumed that primary surveillance radar continues to be required for civil air traffic control.
- 15.1.3 The aviation assessment included: a desktop study where relevant aviation policy and legislation documents were reviewed and considered; identification of aviation bodies and consultation with such bodies; assessment of the potential impacts of the proposed development on all aspects of aviation and identification of any potential mitigation measures that may need to be employed. The aviation assessment concludes that there will be no significant effects on aviation generated by the proposed development as a stand-alone development. When cumulative effects with other wind farms are considered, the assessment concludes that the effect on the provision of air traffic radar services by Cardiff Airport will be minor to moderate and therefore potentially significant. A reduced lighting scheme, in which 13 of the 18 turbines will be fitted with lights, has been approved by the aviation operators using the night low level airspace and by the Civil Aviation Authority (CAA).
- 15.1.4 The assessment on existing infrastructure has been conducted by Natural Power Consultants Ltd (Natural Power). This section summarises the existing public rights of way (PRoW) network and any other public trails in the vicinity of the proposed development. Any existing water, gas and power infrastructure assets and TV and radio reception, and telecommunications are also identified in this section. The Existing Infrastructure assessment concludes that there will be no significant effects on existing infrastructure associated with the proposed development.

15.2 AVIATION

- 15.2.1 Aviatica is a specialist aviation consultancy with over 25 years of experience assessing the impacts of wind energy developments on aviation. This has included the preparation of more than one hundred Environmental Impact Assessment (EIA) chapters for projects across the UK and assessment of more than twenty wind farm developments in Wales.
- 15.2.2 This section considers the likely significant effects on aviation associated with the construction, operation and decommissioning of the proposed development.

15.3 METHOD OF ASSESSMENT

International Regulatory Provisions

- 15.3.1 International standards and recommended practices for aviation are set by the International Civil Aviation Organisation (ICAO). The assessment of lighting requirements in this chapter takes into account the standards and recommended practices for lighting of obstacles, including wind turbines, set out in ICAO Annex 14¹.

Legislation

- 15.3.2 Relevant legislation and guidance documents have been reviewed and taken into account as part of this aviation assessment. This includes the Air Navigation Order (ANO) 2016² and aviation Statutory Instruments enacted under the European Union (Withdrawal) Act 2018.³
- 15.3.3 Certain aerodromes and aviation technical sites are afforded statutory consultation status under the terms of The Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) Direction 2002⁴. Specified types of development located within areas depicted on official safeguarding maps lodged with the local planning authority (LPA) under the terms of the Direction are subject to mandatory consultation requirements.
- 15.3.4 Article 222 of the ANO requires all structures with a height of 150 m or more above ground level to be lit with one or more medium intensity (2000 candela) steady red lights. In relation to wind turbines, this law is modified by the CAA Policy Statement of 2017 (see proceeding paragraphs). Articles 222 (6) and (7) of the ANO allow for the CAA to approve variations from the lighting provisions of Article 222.

Policy

- 15.3.5 The Welsh Government document '*Future Wales: The National Plan 2040*',⁵ Policy 18, states that proposals for renewable and low carbon energy projects (including repowering) qualifying as Developments of National Significance (DNS) will be permitted subject to meeting the criterion that 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). The document contains no provisions relating to the impacts of wind energy developments on civil aviation.
- 15.3.6 Planning Policy Wales (PPW) Edition 11⁶ re-iterates the policy provisions of *Future Wales* for renewable and low carbon energy but contains no specific policies in relation to potential impacts of such developments on aviation, radar or defence.
- 15.3.7 The Neath Port Talbot County Borough Council (NPTCBC) Local Development Plan (LDP) 2011-26⁷ Policy RE 1 advises that proposals for renewable and low carbon energy development will only be permitted subject to the development not interfering with radar, air traffic control systems, telecommunications links, television reception, radio communication and emergency services communications. The NPTCBC LDP Supplementary Planning

¹ International Civil Aviation Organisation (2018) *Annex 14 to the Convention on International Civil Aviation: Aerodromes, Vol.1 – Aerodrome Design and Operations*, Eighth Edition. Montréal. Available from - https://www.iacm.gov.mz/app/uploads/2018/12/an_14_v1_Aerodromes_8ed_2018_rev.14_01.07.18.pdf [Accessed 31/03/2023]

² *The Air Navigation Order 2016*. Available from - <https://www.legislation.gov.uk/uksi/2016/765/contents/made> [Accessed 31/03/2023]

³ UK. (2016) *The Air Navigation Order 2016*. London: Her Majesty's Stationery Office (Statutory Instrument 2016 No.765, as amended by *The Air Navigation Amendment Order 2021*). Available from - <https://www.legislation.gov.uk/uksi/2016/765/contents/made> [Accessed 31/03/2023]

⁴ UK. Department for Transport (2003) *The Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) Direction 2002*. London. Available from - [https://www.gov.uk/government/publications/safeguarding-](https://www.gov.uk/government/publications/safeguarding-aerodromes-technical-sites-and-military-explosives-storage-areas/the-town-and-country-planning-safeguarded-aerodromes-technical-sites-and-military-explosives-storage-areas-direction-2002)

[aerodromes-technical-sites-and-military-explosives-storage-areas/the-town-and-country-planning-safeguarded-aerodromes-technical-sites-and-military-explosives-storage-areas-direction-2002](https://www.gov.uk/government/publications/safeguarding-aerodromes-technical-sites-and-military-explosives-storage-areas/the-town-and-country-planning-safeguarded-aerodromes-technical-sites-and-military-explosives-storage-areas-direction-2002) [Accessed 31/03/2023]

⁵ UK. Welsh Government (2021) *Future Wales: The National Plan 2040*. Cardiff. Available from - <https://gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf> [Accessed 31/03/2023]

⁶ UK. Welsh Government (2021) *Planning Policy Wales*, Edition 11. Cardiff. Available from - https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed 31/03/2023]

⁷ UK. Neath Port Talbot County Borough Council (2016) *Neath Port Talbot County Borough Council Local Development Plan 2011-2016*. Neath Port Talbot. Available from: https://www.npt.gov.uk/PDF/ldp_written_statement_jan16.pdf [Accessed 31/03/2023]

Guidance on Renewable and Low Carbon Energy⁸ re-iterates Policy RE1 of the LDP but provides no further guidance on the implementation of that policy.

- 15.3.8 The Bridgend LDP 2006-2021⁹ contains no references to aviation, defence, radar or airport safeguarding. However, Policy ENV18 on renewable energy developments states that these will be permitted provided that ‘they will not lead to electromagnetic disturbance to existing transmitting and receiving systems (which includes navigation and emergency services), thereby prejudicing public safety’.
- 15.3.9 CAA policy on wind turbines is set out in Civil Aviation Publication (CAP) 764¹⁰. This contains the CAA’s position on the impacts of wind turbines on radar, radio navigation aids, physical obstacle hazards to aircraft and turbulence; describes a range of mitigations that may be applied; and outlines the process of assessing the aviation impacts of wind energy developments in the planning system. The current edition of CAP 764 is dated 2016. A revised version has been drafted and is expected to be published in 2023.¹¹
- 15.3.10 CAA policy on the requirements for lighting of onshore wind turbines with blade tip heights of 150 metres (m) or more is set out in a Policy Statement published in June 2017.¹² This expands on the requirements set out in ANO Article 222. The main requirements are as follows:
- A medium intensity (2000 candela) steady red light on the nacelle of each turbine;
 - Low intensity (32 candela) lights at the midpoint on the turbine tower;
 - Lights to be switched on and off by an appropriate control device such as a timer;
 - 2000 candela lights may be dimmed to 10% of peak intensity (i.e. to an intensity of 200 candela) when the meteorological visibility exceeds 5 kilometres (km).
- 15.3.11 The provisions governing aviation lighting on onshore wind turbines may be subject to amendment, with CAA approval, under the terms of Articles 222(6) and 222(7) of the ANO.
- 15.3.12 The CAA is preparing a policy on the technical and regulatory requirements for approval of aircraft proximity-activated lighting systems. These systems use a variety of techniques to detect aircraft in the vicinity of a wind farm and switch on the lights on the turbines only when an aircraft enters a defined volume of airspace around the wind farm. One such system uses passive receivers to detect transmissions from aircraft transponders.

Guidance and Other Information Sources

- 15.3.13 The assessment in this chapter of potential impacts on aviation and defence has also been informed by the following aviation guidance and sources of information:
- CAA Air Traffic Services Safety Requirements (CAP 670);¹³
 - CAA, CAP 168: *Licensing of Aerodromes*;¹⁴
 - CAA, CAP 738: *Aerodrome Safeguarding*;¹⁵
 - UK Aeronautical Information Publication (AIP);¹⁶ and

⁸ UK. Neath Port Talbot County Borough Council (2017) *Neath Port Talbot County Borough Council Local Development Plan 2011-2016*. Renewable and Low Carbon Energy Supplementary Planning Guidance (July 2017). Neath Port Talbot. Available from - https://www.npt.gov.uk/media/7241/spg_renewable_energy_july17.pdf [Accessed 31/03/2023]

⁹ UK. Bridgend County Borough Council (2011) *Bridgend Local Development Plan 2006-2021*. Available from - <https://www.bridgend.gov.uk/media/1899/written-statement.pdf> [Accessed 31/03/2023]

¹⁰ UK. Civil Aviation Authority (2016). CAA Policy and Guidelines on Wind Turbines, CAP 764. Available from - <https://publicapps.caa.co.uk/docs/33/CAP764%20Issue6%20FINAL%20Feb.pdf> [Accessed 31/03/2023]

¹¹ UK. Civil Aviation Authority (2016) *CAA Policy and Guidelines on Wind Turbines*, Sixth Edition. Gatwick.

¹² UK. Civil Aviation Authority (June 2017) *Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level*. Gatwick. Available from - https://publicapps.caa.co.uk/docs/33/DAP01062017_LightingWindTurbinesOnshoreAbove150mAGL.pdf [Accessed 31/03/2023]

- UK Military AIP.¹⁷

- 15.3.14 In addition, other sources of information used in this chapter include aviation stakeholder responses to other wind farm applications, both regionally and nationally, and responses to Freedom of Information Act requests.

Methodology

- 15.3.15 The scoping exercise (see Appendix 3 in Volume 3 of the Environmental Statement (ES) for full copies of scoping report and scoping direction) identified all air traffic control and air defence radars with the potential to be affected by the proposed development. Preliminary modelling of the line of sight from those radars to the blade tip height of the proposed development determined that only two radars had the potential to detect the turbines. Further modelling was undertaken to determine the extent of visibility from those two radars. Impacts on the other radars within the study area have been scoped out.
- 15.3.16 For radars found to be capable of detecting the proposed development, consultations have been carried out with the operators and an operational impact assessment has been undertaken, taking account of airspace classification, air traffic types and volumes and the type of air traffic services provided using the affected radar. Potential mitigation measures have also been assessed.
- 15.3.17 The potential impacts on military low flying have been assessed by analysing official data on the features of the UK Military Low Flying System in the area of the proposed development and the usage of the low flying areas (LFAs) within which the proposed development is located.
- 15.3.18 The scope for a reduced lighting scheme, for approval by the CAA, has been determined by identifying the likely users of the night low level airspace in the vicinity of the proposed development and consulting them about their preferences for obstacle lighting. Further, the potential for reduced visual impacts of lighting through application of an aircraft proximity-based lighting scheme has been assessed.
- 15.3.19 Significance criteria for assessment of impacts on aviation, unlike those for environmental effects, are not based on the sensitivity of the receptor. Further, while magnitude of impact can be determined in some circumstances, it typically does not provide a standardised metric on which to measure the significance of any effects. In this context, the significance of effects on aviation has been determined in this chapter by application of professional judgement, underpinned by consideration of the magnitude of impact (where measurable), the regulations and procedures in place for ensuring that aviation infrastructure meets required performance standards, the safeguarding policies and practices in use by specific aviation stakeholders, and the consultation responses from those stakeholders.
- 15.3.20 Residual adverse effects of the proposed development on aviation are described as either nil, negligible, minor, moderate or major. Nil, negligible or minor impacts are categorised as not significant. Moderate or major effects are categorised as significant. The definitions of these criteria are shown in Table 15.1.

¹³ UK. Civil Aviation Authority (2019) *Air Traffic Services Safety Requirements*, CAP 670, Issue 3, Amendment 1. Gatwick. Available from - [https://publicapps.caa.co.uk/docs/33/CAP670%20Issue3%20Am%201%202019\(p\).pdf](https://publicapps.caa.co.uk/docs/33/CAP670%20Issue3%20Am%201%202019(p).pdf) [Accessed 31/03/2023]

¹⁴ UK. Civil Aviation Authority (2019) *Licensing of Aerodromes*, CAP 168, Eleventh Edition. Gatwick. Available from - <https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=6114> [Accessed 31/03/2023]

¹⁵ UK. Civil Aviation Authority (2020) *Safeguarding of Aerodromes*, CAP 738, Third Edition. Gatwick. Available from - <https://publicapps.caa.co.uk/docs/33/CAP738%20Issue%203.pdf> [Accessed 31/03/2023]

¹⁶ UK. NATS (2023) *eAIS Package United Kingdom*, Available from - <https://www.aurora.nats.co.uk/htmlAIP/Publications/2023-03-23-AIRAC/html/index-en-GB.html> . [Accessed 31/03/2023]

¹⁷ UK. No.1 Aeronautical Information Documents Unit (2023). *UK Military AIP*, AIRAC Amendment 2302. Northolt. Available from - <https://www.aidu.mod.uk/aip/aipVolumes.html> [Accessed 31/03/2023]

Table 15.1: Significance criteria

| Significance of Effect | Description |
|------------------------|---|
| Major | Regular, frequent or permanent effects which require changes to existing operational and/or technical practice in order to mitigate adequately, or which are not capable of being mitigated adequately. |
| Moderate | Periodic effects experienced which may require alterations to existing operational practice. |
| Minor | Occasional effects experienced which do not require any alteration of existing operational and technical practice. |
| Negligible | Normally no measurable change from baseline conditions; occasional, fleeting or very short term effects experienced which do not require any alteration of existing operational and technical practice. |
| Nil | No measurable change from baseline conditions |

Source: Aviatica

Consultation

15.3.21 Consultations with aviation stakeholders have been undertaken as indicated in Table 15.2. Copies of the correspondence are included in Appendix 3 in Volume 3 of this ES. All potential issues raised by consultees within Table 15.2 have been addressed in Section 15.5.

Table 15.2: Aviation consultations

| Consultee | Response | Action |
|---|--|--|
| (NATS) (formerly) National Air Traffic Services | No impact is anticipated on NATS' en-route radar. No impact is anticipated on NATS' en-route navigation aids. No impact is anticipated on NATS' radio communications infrastructure. The proposed development has been examined by technical and operational safeguarding teams. A technical impact is anticipated at both Cardiff and Bristol; however this has only been deemed to be unacceptable in relation to the operation at Cardiff. | The applicant is in discussions with Cardiff Airport on the potential impact of the proposed development.. |
| Cardiff Airport | <i>The proposed wind farm is located in an area that is used by Visual Flight Rules (VFR) traffic from Cardiff and St Athan. While most of these are under a Basic Service, for any that request a Traffic Service the additional clutter generated by the development may create difficulties in providing the service. In addition,(Instrument Flight Rules (IFR) arrivals to runway 12 and departures from runway 30 at Cardiff may request a Deconfliction Service the clutter from the wind farm would create difficulties in providing the service. Ultimately the clutter presented by the proposed turbines has been deemed to be operationally unacceptable.'</i> | The applicant is in discussions with Cardiff Airport on the potential impact of the proposed development. |

| Consultee | Response | Action |
|--|--|---|
| Ministry of Defence (Defence Infrastructure Organisation) | The application site 'is in an area where military fixed wing aircraft do not routinely operate at low level' 'our Low Flying Subject Matter Experts are content as long as the development is lit in accordance with the CAA' | No action required. |
| Bristow Helicopters/Maritime & Coast Guard Agency search and rescue unit | 'having reviewed the proposed lighting regime for the Y Bryn Windfarm, I concur that the proposal for the lighting arrangements look reasonable from UK SAR's perspective. As always, the developer should ensure that the windfarm is marked on aviation charts and recorded in appropriate aviation terrain and obstruction databases.' | Noted. Prior notification to the CAA, to facilitate incorporation on aeronautical charts and databases, will be carried out as required by Article 225A of the ANO. |
| Wales Air Ambulance | The proposed reduced lighting scheme is considered acceptable. Wales Air Ambulance have no concerns. | No action required. |
| National Police Air Service | With additional lights on T16 and T18 the proposed lighting scheme is acceptable. | Lighting scheme amended to include lights on T16 and T18 |
| Civil Aviation Authority | 'The CAA agrees a variation to the lighting requirements specified in the ANO Article for the Y Bryn wind farm, under provisions given in the Air Navigation Order (ANO) Article 222 section 6'. | Noted. No further action required. |
| Natural Resources Wales | 'We advise that if the proposed scheme acquires the necessary planning consent, we would support the applicant's intention to propose a planning condition which will commit to carrying out a review of the lighting scheme prior to construction, with the aim of minimising the number of lights, intensity and frequency and duration of their illuminance, as detailed within your letter.' 'We note that the applicant will address the detail of the specification and approval process for an Aircraft Detection Lighting System (ADLS) when the Civil Aviation Authority (CAA) publishes its policy on these systems.' | No action required. |
| Airbourne Solutions Ltd | 'with regards to fire fighting operations and use of the Cwm Wernderi reservoir whilst this wind farm will impede the operation when we are required to use this reservoir it will not stop the operation from what we can see. Our entry and exit routes for this reservoir do depend on the wind direction but the general routing is either from the West up the valley with a climb out to the East / south east or the reverse of that.' | No action required. |

15.4 BASELINE

15.4.1 The proposed development is located in uncontrolled airspace from ground level to Flight Level 195 (FL195 – approximately 19,500 feet above mean sea level (amsll)).

- 15.4.2 The UK Military Low Flying System extends from ground level to 2000 feet above ground level (agl). During daylight hours the airspace over the proposed development is part of LFA 7, covering the whole of Wales, within which fixed wing military aircraft may be authorised to fly at a minimum of 250 feet agl. However the proposed development is within part of LFA 7 known as the Glamorgan Transit Area, within which:
- Fixed wing military aircraft are not permitted to fly at less than 2000 feet agl;
 - Medium and large helicopters are not permitted to fly at less than 1000 feet agl; and
 - Small helicopters are not permitted to fly at less than 500 feet agl in rural areas and 1000 feet agl in congested areas.¹⁸
- 15.4.3 In the part of the Glamorgan Transit Area overlying the proposed development, low flying military aircraft are subject to directional flow control, requiring aircraft to fly in a southerly direction.
- 15.4.4 During night hours, the military low level airspace overlying the proposed development is part of Night Rotary Region 7 South (NRR7S), predominantly for use by helicopters but where fixed wing aircraft may also be authorised to fly. The provisions of the Glamorgan Transit Area also apply to night low level flights. The Ministry of Defence advises that the proposed development is in a part of the low flying system which is an 'area with no military low flying concerns'.¹⁹
- 15.4.5 Between 2000 feet and FL240, the airspace over the proposed development is part of Airborne Surveillance and Control (ASAC) Training Area 4, where Royal Navy air interception and air combat manoeuvring training activity may take place.
- 15.4.6 Between FL195 and FL245 over the proposed development is the Class C controlled airspace of the London Flight Information Region (FIR). This section of airspace is also part of Temporary Reserved Area (TRA) 001, which may be activated periodically for military use.
- 15.4.7 Above FL245 is the Class C controlled airspace of the London Upper Information Region. The proposed development is within the nominal 5 nautical miles (nm) width of two air traffic service routes (or 'airways') in that airspace – L607 and UP16.
- 15.4.8 Within the airspace over the proposed development, air traffic radar services are provided as follows:
- Up to FL100 a Lower Airspace Radar Service can be provided by Cardiff Airport air traffic control (ATC);
 - Between FL100 and FL245 an air traffic service can be provided by Western Radar, using data from NATS En Route radars; and
 - In the controlled airspace above FL245, air traffic services are provided by London Control from the NATS en Route Swanwick Centre.
- 15.4.9 Wind turbines within line of sight and operational range of a primary surveillance radar (PSR) may cause false targets to be displayed on the radar, which may have an adverse impact on the provision of air traffic services by controllers. The following air traffic control primary surveillance radars are located within a radius of 125 km of the proposed development:
- NATS Clee Hill;
 - NATS Berrington;
 - Cardiff Airport;
 - Bristol Airport;
 - Exeter Airport;
 - Yeovil Airfield;
 - Gloucestershire Airport;
 - Royal Navy (RN) Hartland Point;
 - Royal Naval Air Station (RNAS) Yeovilton; and
 - QinetiQ Aberporth range.
- 15.4.10 Of these, the radars at Clee Hill, Berrington, Bristol, Exeter, Yeovil, Gloucestershire, Yeovilton and Aberporth have been scoped out of further assessment. They do not have line of sight to the proposed development due to intervening terrain and/or they are not used to provide air traffic services in the airspace overhead the proposed development and/or their operational range is insufficient to cover the proposed development.
- 15.4.11 The Meteorological Office requests consultation on wind energy developments within 20 km radius of its weather radars. The closest such facilities to the proposed development are at Crug-y-Gorllwyn, Carmarthen (65 km to the north-west) and Cobbacombe Cross, Devon (71 km to the south). Since the proposed development is well beyond the requested consultation zones, Meteorological Office radars are scoped out of the assessment.
- 15.4.12 The proposed development is not located in an area subject to any of the statutory safeguarding provisions of *The Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) Direction 2002*.
- 15.4.13 There are three licensed aerodromes within 35 km radius of the proposed development – Cardiff, St Athan and Swansea. Cardiff is a Code 4 aerodrome located 31 km south-east of the proposed development. It is certificated under Regulation (EU) No. 139/2014 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018. It is equipped with a Thales STAR 2000 primary surveillance radar and provides a Lower Airspace Radar Service in the uncontrolled airspace over the proposed development.
- 15.4.14 St Athan is a Code 4 aerodrome licensed under the terms of the Civil Aviation Authority guidance CAP 168: *Licensing of Aerodromes*. It is not equipped with radar. It is located inside controlled airspace under the authority of Cardiff Airport ATC. CAA guidance (CAP 764) advises consulting on wind energy developments within 17 km of an aerodrome in this category. St Athan is 26 km from the proposed development. Aircraft operations from St Athan that may use the airspace in the vicinity of the proposed development include the Bristow Helicopters/Maritime & Coastguard Agency search and rescue helicopter unit and the National Police Air Service. Those operators have been consulted on the lighting scheme for the proposed development.
- 15.4.15 Swansea is a Code 2 aerodrome licensed under the terms of CAP 168. It is not equipped with radar and is available to VFR traffic only. CAP 764 advises consulting on wind energy developments within 17 km of an aerodrome in this category. Swansea Airport is 24 km from the proposed development. Therefore, there is no requirement to consult the operator and impacts on this facility are scoped out of assessment.
- 15.4.16 Wales Air Ambulance operates from the unlicensed Cardiff Heliport, 40 km south-east of the proposed development. They may conduct operations at night in the vicinity of the proposed development and have therefore been consulted on the proposed lighting scheme.
- 15.4.17 There is an unlicensed airstrip at Old Park Farm, 4 km south of the proposed development, with a runway length of 350 m. It is in use by microlight aircraft operating in daylight under the Visual Flight Rules only. The proposed development is well clear of all approach and departure paths and circuit patterns of this airstrip. CAP 764 advises consulting on wind energy developments within 3 km of an aerodrome in this category. Therefore there is no requirement to consult the operator and impacts on this facility are scoped out of assessment.

¹⁸ UK. Military Aviation Authority (2021) *Regulatory Article 2330 – Low Flying*, Issue 5, paragraph 44. Available from - <https://www.gov.uk/government/publications/regulatory-article-ra-2330-low-flying> [Accessed 31/03/2023]

¹⁹ UK. Ministry of Defence, Defence Infrastructure Organisation (October 2011) *Low Flying Consultation Zones*, Map Reference DE090071, Version 007. Sutton Coldfield. [Accessed 23/02/2023]

15.4.18 Wind turbines with blade tip heights of 150 m or more are subject to the obstruction lighting provisions of Article 222 of the Air Navigation Order, as detailed in the CAA Policy Statement of 2017²⁰.

15.4.19 In summary, potential impacts on the following receptors have been scoped out of assessment as a result of the scoping process:

- The radars at Bovingdon, Pease Pottage, Portreath, Clee Hill, Burrington, Bristol, Exeter, Yeovil, Gloucestershire, Yeovilton and Aberporth;
- Meteorological Office radars;
- Daytime military low level flying;
- Swansea Airport; and
- Old Park Farm airstrip.

15.5 ASSESSMENT OF POTENTIAL IMPACTS

15.5.1 The aviation assessment has concluded that as a stand-alone scheme the proposed development will have no significant effects on aviation.

Air Traffic Control Radar

15.5.2 The scoping exercise identified the air traffic control primary surveillance radars at Cardiff Airport and RN Hartland Point as having the potential to detect Y Bryn turbines. NATS, which provides the air traffic control services at Cardiff Airport as well as to en route air traffic, were consulted on the potential impacts of the proposed development on their en route and airport radars and other infrastructure. They advised that the proposed development would have no impact on their en route radars, navigational aids or radio communications infrastructure; that the impact on the radar at Bristol Airport was acceptable; and that the proposed development could generate false plots on the Cardiff Airport radar in an area where Cardiff controllers provide services to aircraft operating to and from Cardiff and St Athan.

15.5.3 On the basis of radar line of sight modelling and the consultation response from NATS En Route (NERL), the impact of the proposed development on NERL en route radars, navigation aids and radio communications infrastructure is assessed as nil and therefore not significant. The impact on the Bristol Airport radar is assessed as minor and therefore not significant.

15.5.4 Radar modelling established that the Cardiff Airport PSR has line of sight to all turbine locations in the proposed development at heights at and above 150 m agl. It can be expected that the radar will be capable of detecting the rotating turbine blades. The PSR at Cardiff Airport is a Thales STAR-2000. This is a digital solid-state radar with significant data processing capability compared to the 1980s-era radars which they replaced. The STAR-2000 is a plot-extracted radar which only displays targets that have been detected by the radar over a period of at least three scans of the radar antenna and have met set criteria (such as ground speed, Doppler characteristics and turn rates) to be declared as a valid aircraft target. The processes of plot and track extraction eliminate many false targets that otherwise would have appeared on earlier generation radars such as the Watchman.

15.5.5 The STAR 2000 radar has high performance against unwanted targets (clutter) by use of adaptive antenna beam switching, automatic selection of up to four different Doppler filters, automatic constant false alarm rate (CFAR) threshold setting, false target and interference filtering and high resolution clutter maps.²¹ To address the issue of

false returns from wind turbines the manufacturer provides '*dedicated impact studies and implementation of optimal mitigation, among a large panel of solutions*'.²² STAR 2000 radars operating at a number of UK civil airports, including Inverness, Belfast International and Cardiff, have demonstrated their ability to process out returns from wind turbines that were visible on the earlier generation radars that they replaced from 2009 onwards.

15.5.6 Discussions with Cardiff Airport and their air navigation service provider NATS Services Ltd have confirmed that, while their STAR 2000 radar processes out wind turbine returns much of the time, their concern in relation to the proposed development relates mainly to the cumulative impact with other existing developments. This is discussed later in this section.

15.5.7 The NATS scoping response refers to two potential impacts of the proposed development on aircraft in receipt of an air traffic service from Cardiff Airport ATC:

- VFR traffic that may request a Traffic Service; and
- Instrument Flight Rules (IFR) arrivals to runway 12 and departures from runway 30 at Cardiff requesting a more direct route through uncontrolled airspace under a Deconfliction Service.

15.5.8 CAA Lower Airspace Radar Service (LARS) data for the period 2016-2021 shows that Cardiff was the 15th busiest LARS unit, out of a total of 27, in terms of number of aircraft provided with a service. The unit provided a LARS service to an average of 28 aircraft per day over this period.²³ Cardiff's LARS area extends to a 40 nm radius from the airport. The data does not provide any indication of the geographical distribution of numbers of aircraft handled in different parts of that area. Of the average 28 aircraft a day provided with a service, approximately 23 (81.4% of the total) were provided with a Basic Service. This is a service where pilots are wholly responsible for separation from other aircraft; the controller is not required to monitor the flight; and pilots should not expect any form of traffic information from the controller.²⁴ The NATS scoping response indicates that Cardiff ATC is not concerned about the impact of the proposed development on aircraft in receipt of a Basic Service.

15.5.9 The remaining 18.6% of aircraft provided with a LARS service by Cardiff ATC in the period 2016-21 – approximately five aircraft a day on average - were in receipt of either a Traffic Service or a Deconfliction Service.²⁵ A Traffic Service is available to VFR or IFR traffic. Under this service, the controller provides the pilot with bearing, distance and level information on potentially conflicting traffic that may pass within three nm or 3000 feet of the aircraft but does not provide deconfliction advice; it remains the pilot's responsibility to decide what action to take, if any, to avoid the other aircraft. A Deconfliction Service is only available to IFR traffic. Under this service the controller provides information on potentially conflicting traffic and also provides headings and/or levels to enable the aircraft to maintain specified minimum horizontal or vertical separation from the conflicting traffic.

15.5.10 The Universities of Wales Air Squadron (UWAS), based at St Athan, makes regular use of the uncontrolled airspace to the north-west of Bridgend. Its Tutor aircraft are required to use a Traffic Service from Cardiff ATC when operating in this airspace. It is expected that the majority of the average five aircraft a day receiving a Traffic Service or Deconfliction Service from Cardiff ATC are UWAS Tutors in receipt of a Traffic Service.

15.5.11 The frequency with which IFR traffic to/from Cardiff requests a direct routing through the uncontrolled airspace between Bridgend and Ammanford is not known. Such direct routings would only be relevant for aircraft routing between Cardiff and airports in the Republic of Ireland or North America. Summer 2023 scheduled services to/from these destinations consist of seven flights a week to/from Dublin.²⁶ These direct routings, which involve leaving controlled airspace for a period and then re-entering it further along the route, cannot be given on the initiative of the controller. They can only be given at the request of the pilot.²⁷ The controller's decision on whether or not to

²⁰ UK. Civil Aviation Authority (June 2017) *Policy Statement: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level*. Gatwick. Available from - https://publicapps.caa.co.uk/docs/33/DAP01062017_LightingWindTurbinesOnshoreAbove150mAGL.pdf [Accessed 31/03/2023]

²¹ Thales (2005) STAR 2000 S-band solid-state approach radar. Bagnaux. [Accessed 10/02/2023]

²² Thales (2013) STAR 2000 S-band solid-state approach radar. Rungis. [Accessed 10/02/2023]

²³ CAA (2021). Freedom of Information Act response reference F0005399. Crawley.

²⁴ CAA (2021). CAP 774: UK Flight Information Services, paragraphs 2.1, 2.5. Crawley. [Accessed 11/02/2023]

²⁵ The CAA data do not differentiate between aircraft receiving a Traffic Service and those receiving a Deconfliction Service.

²⁷ CAA (2021) CAP 493: Manual of Air Traffic Services Part 1, paragraph 13A.3. Crawley. [Accessed 11/02/2023]

grant the request will depend on the traffic picture in the area of uncontrolled airspace at the time of receiving the request, and whether any traffic in that airspace is in receipt of a service from Cardiff - and can therefore be co-ordinated - or is unknown and would therefore require to be avoided by at least 5 nm.

- 15.5.12 On the information available for this assessment, given the relatively low frequency of the circumstances giving rise to Cardiff ATC's concerns and the known performance of the Cardiff Airport PSR against wind turbines, the significance of the effects of the proposed development, as a stand-alone development, on provision of air traffic services by Cardiff ATC is assessed as minor and not significant.
- 15.5.13 Radar modelling established that the RN Hartland Point radar has line of sight to all turbine locations in the proposed development at heights at and above 150 m agl. It can be expected that the radar would detect the rotating turbine blades. Data from the RN Hartland Point radar is used by RNAS Yeovilton ATC, the Royal Naval School of Fighter Control and RNAS Culdrose, principally to provide air traffic services to RN aircraft operating in military danger areas in the Bristol Channel, and in Royal Navy air navigation and airborne surveillance and control training areas. These activity areas are mainly offshore and air traffic services are not normally provided to RN aircraft in the overland areas around the proposed development.
- 15.5.14 The Ministry of Defence (MoD) advised in their scoping response that they have no concerns about impacts of the proposed development on radars. The Hartland Point radar, the impact of the proposed development on the Hartland Point radar is therefore assessed as nil and not significant.

Low Flying Aircraft and Lighting

- 15.5.15 The MoD scoping response additionally advised that the turbines would require lighting to mitigate impact on low flying military aircraft. The proposed development is wholly located within the Glamorgan Transit Area, a part of the UK Military Low Flying System which is classified by the MoD as an 'area with no military low flying concerns'.²⁸ On that basis, the significance of effect of the proposed development on military low flying is assessed as negligible. The MoD has subsequently confirmed that it is content with the reduced lighting scheme submitted to the CAA for approval.
- 15.5.16 Tall structures such as wind turbines can present an obstacle hazard to low flying aircraft. To mitigate this hazard at night, ANO Article 222 requires structures 150 m or more agl to be fitted with medium intensity lights. In addition, Articles 222(6) and 222(7) require the CAA to approve alternative configurations of lighting, while ICAO Annex 14 provides for alternative schemes for lighting of obstacles to be approved on the basis of a special aeronautical study.²⁹ In order to reduce the visual impact of lighting on the proposed development on non-aviation receptors while maintaining air safety, a reduced lighting scheme is proposed. This has been developed in consultation with the three principal civilian operators at night at low altitude in this part of Wales:
- Bristow Helicopters/Maritime & Coastguard Agency search and rescue helicopter unit, St Athan;
 - National Police Air Service, St Athan; and
 - Wales Air Ambulance, Cardiff Heliport.
- 15.5.17 The proposed lighting scheme is as follows (and also seen on Figure 15.1):
- A 2000 candela steady red light on the nacelles of Turbines 1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 16, 17 and 18;
 - An infra-red light (not visible to the unaided human eye) on all turbines;
 - No provision of mid-tower 32 candela lighting;
 - The 2000 candela lights will be dimmed to 10% of peak intensity when the visibility exceeds 5 km;
 - The 2000 candela lights will only be switched on between the hours of sunset + 30 minutes and sunrise - 30 minutes; and

- It is the intention of the applicant to install an aircraft proximity-activated lighting system on the proposed development. This will only switch the lights on when an aircraft is detected within CAA-specified horizontal and vertical distances from the wind farm. An assessment of the frequency with which such a system would switch the lights on is contained in Appendix 15.1 in Volume 3 of the ES. A CAA policy on the technical criteria and regulatory provisions for proximity-activated lighting is expected to be published in 2023.

- 15.5.18 The proposed lighting scheme was submitted to the CAA for approval in March 2023 and received approval from the CAA on 21st April 2023 (see Appendix 3.3 for consultation). With the proposed lighting scheme in place the significance of the effects of the proposed development on aircraft flying at low altitude at night is assessed as minor and therefore not significant.
- 15.5.19 During the scoping exercise a number of respondents raised the issue of the effects of the proposed development on the ability of firefighting helicopters to use the Cwm Wernderi Reservoir – within the southern part of the development site – as a water source when fighting forest fires in the vicinity. The proposed development is located on land managed by Natural Resources Wales (NRW). NRW contracts the specialist helicopter operator Airbourne Solutions Ltd to provide aerial firefighting services covering all NRW forest assets in Wales. These services are provided in close co-operation with the North Wales, Mid and West Wales and South Wales Fire and Rescue Services. Airbourne Solutions has advised that the proposed development would impede their use of the reservoir but would not prevent its use. The effect of the proposed development on aerial firefighting operations is therefore assessed as minor and not significant.

Cumulative Impacts

- 15.5.20 Radar modelling has been carried out to determine which of the wind turbines included up to a 20 km extent in the cumulative assessment (see Appendix 8.1 for list of wind farm developments) are within theoretical line of sight of the Cardiff Airport PSR. Of the 231 operational turbines within 20 km of the outermost turbines of the proposed development, 143 (62%) were found to be within line of sight of the Cardiff Airport PSR. The airport is recorded as not objecting to the two projects closest to the proposed development – operational Mynydd Brombil to the south and recently consented Foel Trawnant to the north.
- 15.5.21 Discussions between the applicant and Cardiff Airport have determined that their concerns relate primarily to cumulative impact. However, it is not known how Cardiff ATC controllers manage the impact on provision of air traffic services in this section of airspace in the presence of the potential clutter from the 143 existing radar-visible turbines. In conducting this assessment, no data could be found indicating that those existing radar-visible turbines have been generating adverse safety consequences. In the context of the known performance of the STAR 2000 radar against wind turbine-related clutter, it is considered likely in any event that any returns from the proposed development can be managed through the in-built capabilities of the radar. The applicant is in discussions with Cardiff Airport about ways in which those internal capabilities of the radar can be deployed most effectively to mitigate any cumulative effects the proposed development may have on provision of air traffic services in this section of airspace. The cumulative impact of the proposed development on Cardiff Airport is therefore assessed as minor to moderate, and therefore potentially significant.
- 15.5.22 No MoD objections have been recorded in the planning documents for any of the other wind farm developments in this area. It is concluded from this that the MoD considers the cumulative impact of multiple wind farms in this area to be acceptable. Additionally, since the MoD has not objected to the proposed development, the cumulative impact of the proposed development on MoD activities is assessed as negligible and therefore not significant.

15.6 CONCLUSIONS ON AVIATION

- 15.6.1 As a stand-alone development, the proposed development will have no significant effects on aviation. When cumulative effects with other wind farms are considered, the effect on the provision of air traffic radar services by

²⁸ UK. Ministry of Defence, Defence Infrastructure Organisation (October 2011) *Low Flying Consultation Zones*, Map Reference DE090071, Version 007. Sutton Coldfield. [Accessed 24/11/2022]

²⁹ ICAO (2018) Annex 14, Vol.1, paragraphs 4.3.2 and 6.1.2.2. Montréal. [Accessed 24/11/2022]

Cardiff Airport is assessed as minor to moderate and therefore potentially significant. The applicant is in discussions with Cardiff Airport on the nature and scale of the effects of the proposed development on their provision of air traffic services and on a range of potential mitigation measures, should these be deemed necessary, to render the effects not significant.

- 15.6.2 A reduced lighting scheme, in which 13 of the 18 turbines will be fitted with lights, has been approved by the aviation operators using the night low level airspace and by the CAA. Therefore, the effect of the proposed development on aircraft flying at low altitude at night is considered to be not significant.

15.7 EXISTING INFRASTRUCTURE

- 15.7.1 This section of the chapter summarises the potential effect of the proposed development on existing infrastructure, including telecommunications, utilities and public access, during the construction (including decommissioning) and operational phase.

Planning Context and Policy Requirements

- 15.7.2 Tables 15.3 summarises planning guidance and policy relevant to potential effects from wind farm development on telecommunications, television, utilities and PRow.

Table 15.3: UK and Welsh, planning guidance, policy and legislation relating to telecommunications, television, utilities and PRow

| Document | Policy Text |
|--|--|
| Future Wales: The National Plan 2040 (2021) Welsh Government | Policy 18 – Renewable and Low Carbon Energy DNS. <i>‘Proposals for renewable and low carbon energy projects ‘including repowering’ qualifying as Developments of National Significance will be permitted subject to policy 17 and the following criteria: ...</i> <i>7. there are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance;’</i> |
| Guidance for Local Authorities on Public Rights of Way (October 2016) Welsh Government | Section 7. Planning Consent and the Network covers development land in relation to PRow. Paragraph 7.1 states: <i>‘Proposals for the development of land affecting public rights of way give rise to two matters of particular concern: the need for adequate consideration of the rights of way before the decision on the planning application is taken; and the need, once planning permission has been granted, for the right of way to be kept open and unobstructed until the statutory procedures authorising closure or diversion have been completed.’</i> Paragraph 7.3 states <i>‘The effect of development on a public right of way is a material consideration in the determination of application for planning permission and authorities should ensure that the potential consequences are taken into account whenever such applications are considered.’</i> |
| Technical Advice Note 16: Sport, Recreation and Open Space | Paragraph 3.41 states <i>‘...Public rights of way should be protected, and information about them, shown on Definitive Maps and statements, should be considered when assessing applications for planning permission...’</i> |
| Technical Advice Note 19: Telecommunications (2002) | Paragraphs 89-91 explain the different types of telecommunications interference and these paragraphs and Annex 2 provide guidance on how they should be addressed when determining planning applications. Paragraph 90 states: <i>‘Where the potential for interference to telecommunications or broadcast signals is expected, co-ordination with the Radiocommunication Agency</i> |

| Document | Policy Text |
|--|---|
| | <i>and the broadcasters or fixed-link operators will be required to ascertain whether an engineering solution to the problem is feasible. In such instances, they should be contacted at the earliest stage in the planning process and their advice taken into account. Where such problems are likely, local planning authorities may grant planning permission subject to a condition that, before development commences, the developer will ensure that the quality of any reception affected by the development will be restored.’</i> |
| Ofcom – Tall structures and their impact on broadcast and other wireless services (2009) | Section 4.2 details the fixed link clearance service Ofcom provides <i>‘...to help ensure compatibility between proposed wind turbines and existing fixed point to point links that make use of Ofcom-assigned spectrum...’</i> Also Annex 1 contains a report <i>‘The impact of wind farms on domestic television reception – technical details.’</i> |
| Countryside and Rights of Way (CRoW) Act 2000 | <i>‘An Act to make new provision for public access to the countryside; to amend the law relating to public rights of way; to enable traffic regulation orders to be made for the purpose of conserving an area’s natural beauty; to make provision with respect to the driving of mechanically propelled vehicles elsewhere than on roads; to amend the law relating to nature conservation and the protection of wildlife; to make further provision with respect to areas of outstanding natural beauty; and for connected purposes.’</i> |
| Right of Way Improvement Plan 2020-2030 (2020) Neath Port Talbot | Neath Port Talbot Council have produced a 10-year plan to improve protect and maintain PRow within the county, to facilitate easy access to the countryside and meet the needs of users. |
| NPTCBC LDP (2011-2026) | Policy RE1: <i>‘All renewable energy or low carbon energy development proposals will be required to demonstrate that...:</i> <i>4.(d) The development would not interfere with radar, air traffic control systems, telecommunications links, television reception, radio communication and emergency services communications’.</i> |
| Bridgend County Borough Council (BCBC) LDP 2018-2033 | PLA9: Development Affecting PRow. <i>‘As part of adopting a sustainable placemaking approach, development must link with but seek to minimise impacts on the PRow network. Any predicted adverse impacts on the character, safety, enjoyment and convenient use of a PRow must be mitigated through the provision of an acceptable alternative route.’</i> |

Source: Natural Power

Telecommunications

- 15.7.3 A number of links have been identified in the surrounding area around the proposed development and any resultant design implications (if applicable) are discussed.

Microwave Fixed Links

- 15.7.4 Fixed microwave links are direct line-of-sight communication links between transmitting and receiving dishes placed on masts generally located on hilltops that vary in length from a few kilometres to several tens of kilometres away. They are used for the transmission of information to broadcasting masts for TV and radio and for the mobile telephone networks.

15.7.5 Ofcom's online Spectrum Information Portal contains detail on fixed links, which has been reviewed. There is one microwave link managed by the Joint Radio Company on behalf of Western Power Distribution which passes through the Y Bryn site boundary, running between Foel Fynyddau north of Cwmafan to a substation to the south of Croeserw, passing over Cefn yr Argoed and Foel Trawnant. As the link is over 900 m from a nearest turbine on Y Bryn, beyond the 2nd Fresnel zone for separation³⁰, no mitigation is considered necessary.

15.7.6 With the information available to the applicant, the proposed development does not directly affect microwave fixed links and the potential effect on microwave fixed links is not significant. Pre-construction checks would be undertaken to ensure this still remains the case nearer the time of construction.

Other Radio Communication Networks and Television

15.7.7 Where turbines with low amount of metal in the blades are used, as is envisaged for the proposed development (it is proposed blades will be constructed from fibreglass), there is little evidence of adverse interactions with radio transmission and reception, including domestic radio service, Citizen's Band (CB) and services communications due to the low frequency of the signals.

Analogue and Digital Television Signals

15.7.8 Potential interference experienced by television signals to consider associated with wind farm developments are direct signals which pass from transmitter to receiver in a straight line. These signals can be reflected by a turbine so the signal can travel from the transmitter before being reflected off the turbine and finally reaching the receiver. However terrestrial television coverage in the settlements surrounding the turbines may be weak due to varying topography.

15.7.9 The interference mechanisms are the same for both analogue and digital transmissions. The main difference between the two is the way the interference appears on the television screen. Analogue signals may suffer ghosting or flickering from a small amount of interference however digital signals tend to be less affected by small amounts of interference. A full 'Television and Radio Written Scheme' has been completed by Pager Power Ltd and can be seen in Appendix 15.3 in Volume 3 of the ES.

Radio Signals

15.7.10 The interference mechanisms experienced by television signals as a result of wind farm developments are similar for radio signals. However radio signals are slightly more resilient and can tolerate wind turbine interference better than television signals. A full 'Television and Radio Written Scheme' has been completed by Pager Power and can be seen in Appendix 15.3.

15.7.11 Pager Power concluded that:

'Although it is true that wind turbine interference appears more likely when the received signal is weak there is no direct relationship between direct signal strength and observed picture and audio interference.'

15.7.12 Therefore, the potential effect of the proposed development is considered not significant with respect to other radio communication networks and television.

Amateur Radio

15.7.13 Through the public consultation process, the issue of potential impact on amateur radio hobbyists, particularly the Radio Amateurs Emergency Network ('RAYNET') group were raised by a local member, and a commitment was made by the applicant to provide an assessment as part of the application.

15.7.14 The Amateur Radio Commentary, produced by Pager Power, in Appendix 15.4 reviews and addresses the topic, concluding that:

- Amateur radio is not safeguarded by Ofcom;

- Pager Power is unaware of wind developments in the UK or elsewhere causing significant adverse effects for amateur radio services;
- It is possible that radio signals will pass through the proposed development;
- Interference situations are possible;
- Wind farm interference for amateur radio is generally no greater than interference from other sources;
- Amateur radio operators have a variety of ways to improve radio system performance. These are mostly associated with changes to aerials and radio equipment or increasing transmitted power levels; and
- An operational process to resolve radio interference issues would be to use alternative amateur radio frequencies or technologies.

15.7.15 Overall, minor effects on amateur radio performance are considered possible; however, significant effects are unlikely.

Utilities – Electricity, Water & Gas

Overhead Electricity Network

15.7.16 There are overhead electricity lines within and adjacent to the Y Bryn site boundary. See Figure 4.1: Site Constraints in Volume 2 of the ES for location of the power lines.

15.7.17 One overhead line is located just inside the north section, near the south-west of the Y Bryn site boundary, and also runs parallel to the northern edge of the south section and crosses the link road between the north and south sections that will be used to transport the turbine components. Another overhead electricity line crosses the most southern part of the south section, where turbine components will be entering the site.

15.7.18 Turbines have all been positioned at a considerable distance away from overhead lines and therefore is not considered to be an issue from an operational perspective. Access routes being utilised for the proposed development will have appropriate warning signs for overhead lines. Therefore, considering the location of the electricity lines in relation to proposed infrastructure, with appropriate mitigation during the construction phase (and similar for the decommissioning phase), the potential effect of the proposed development on overhead electricity lines is considered not significant.

Water Supply

15.7.19 Chapter 10: Hydrology, Geology, and Hydrogeology presents the relevant hydrological assessment relating to water supply.

Private Water Supplies

15.7.20 Increased sediment erosion as a result of wind farm construction and decommissioning can have impacts on the quality, quantity, and continuity of water supply to the properties.

15.7.21 NPTCBC and BCBC provided information on private water supplies (PWS) within 3 km of the Y Bryn site boundary and letters were issued to all identified properties so that further assessment could be undertaken to identify any potential effects on private water supplies and appropriate mitigation.

15.7.22 Please see detail in Chapter 10: Hydrology, Geology & Hydrogeology, which concluded that with good practice design and construction of the proposed development delivered through a skilled team of competent workers, with mitigation and compliance monitored in collaboration with NRW, NPTCBC and BCBC councils and other engaged stakeholders, will result in a risk that is considered to be **not significant** in the professional judgment of Natural Power.

³⁰ Bacon, F, D., (2002). *Fixed link wind turbine exclusion zone method*. Available from - https://www.ofcom.org.uk/data/assets/pdf_file/0031/68827/windfarmdavidbacon.pdf [Accessed 31/03/2023]

Public Water Supplies

- 15.7.23 There are no mapped Drinking Water Protected Areas (Lake or River) within or within the vicinity of the Y Bryn site boundary.
- 15.7.24 There should therefore be no significant adverse effect upon the public water supply, as noted in Chapter 10.

Gas

- 15.7.25 No gas infrastructure has been identified within the Y Bryn site boundary, and therefore it is not considered further in this chapter.

Underground Assets

- 15.7.26 A coal mining risk assessment has been undertaken and concludes that information within the Coal Authority reports suggests that all features are/have the potential to be underlain by historical workings although, only five of the features, Penhydd Mast, T1, Penhydd Entrance construction compound, T6, and T15 are within areas defined by the Coal Authority as high risk (i.e. shallow coal workings potentially present). Full copy of the assessment can be found in Appendix 10.2.
- 15.7.27 Part of the disused Port Talbot Railway Company railway line from Port Talbot to Maesteg passes under the proposed development via the Cwmcerwyn Tunnel. The 925 m tunnel, owned by Highways England, is security gated to keep members of the public from entering. The route of the existing Heol y Moch forestry haulage road, as used by NRW and as also used for the construction of Mynydd Brombil Wind Farm, runs on the surface above the tunnel. Given the depth below ground, the existing use of land above and the restriction to public access, no significant engineering risks to the tunnel or safety risks to the public are foreseen.

Public Access

Public Rights of Way (PRoW) and Permissive Routes

Baseline

- 15.7.28 Y Bryn Site Boundary hosts a number of PRoW (see Figure 15.2), including footpaths and bridleways, and the St Illtyd's Walk which is recognised as a Long-Distance Footpath (LDF) and has historical religious associations as it was established as a pilgrimage in the honour of St Illtyd³¹. The Ogwr Ridgeway Walk which is a permissive route runs adjacent to the south-eastern boundary of the south section. The Welsh Government woodland estate portions of the site are Open Access Dedicated Forests. There is a small area of Open Access Land within the Y Bryn site boundary south-west adjacent to the M4. There are two areas of Open Access Land adjacent to the Y Bryn site boundary, north and south of the North section. NRW has a concordat with the British Horse Society, and regularly gives permission for events to be held within its forests.
- 15.7.29 A local authority recognised route known as the North to South Dragon Ride, promoted by the British Horse Society (BHS) and used by walkers, horse riders and cyclists. runs along the northern boundary of the north section before running through the eastern section of the site, east of T4 and T5, continuing southwards through the south section of the site, east of turbines T6-T9, and running between T02 and T11 before continuing south beyond the Y Bryn Site Boundary. The section of the North to South Dragon Ride which crosses the site is only part of a larger route that stretches approximately 293 miles and runs down the length of Wales from Ffynnonogroyw, Flintshire in North Wales, to Margam Park, Port Talbot in South Wales.
- 15.7.30 At the time of this assessment there are two known claimed PRoW applications within the Y Bryn site boundary one within BCBC area, and one within NPTCBC area, however these have not yet been determined and are

therefore not considered further, as discussed with BCBC and NPTCBC. Any further information requests relating to these claimed PRoW should be sought from BCBC or NPTCBC.

Consultation

- 15.7.31 The scoping opinion from NPTCBC noted the following relating to PRoW:
- 'In relation to Public Rights of Way, the authority generally requires wind turbines to be a minimum tip height (250 m in this case) plus 30 m away from a Bridleway or Byway to avoid users in case of collapse – although with only one of each present on these sites this should be achievable on this development. If this is not possible the developer should enter discussions with the Authority's Rights of Ways Officers.'*
- 15.7.32 No specific mention of PRoW were provided by BCBC in their scoping opinion.
- 15.7.33 Following scoping, further consultation has been undertaken with PRoW officers from BCBC and NPTCBC at an early stage to agree appropriate forms of mitigation as a result of construction and operational effects of the proposed development on PRoW, non-designated routes, and also enhancement measures.
- 15.7.34 During consultation with PRoW officers from both councils it was agreed that the originally suggested buffer for PRoW in the scoping direction by NPTCBC of tip height, plus 30 m for bridleways and byways, was not achievable for all turbines as it would restrict placement of a number of turbines, severely reducing the energy output of the proposal and therefore minimising the contribution in meeting renewable energy targets.
- 15.7.35 Through discussions with both PRoW officers the following was agreed in relation to PRoW:
- An 86 m (blade length) buffer considered acceptable for all registered footpaths;
 - A 200 m buffer considered acceptable for registered bridleways;
 - Appropriately worded condition to be included to address ice throw; and
 - with regards to the local authority recognised bridleway route, the applicant is committed to providing mitigation for the two sections of the route (near T4 and T5, and also T10 and T11) that comes closer than 200 m, which is considered an appropriate distance that could be met without severely restricting the energy output of the scheme.
- 15.7.36 Both these sections of the local authority recognised route are located in Bridgend, and it is expected that a planning condition will be secured to ensure that, for instance, users may be able to travel at a greater distance from the turbine if they wish to do so via an alternative permissive path. This has been agreed in principle as an appropriate form of mitigation with PRoW officers from BCBC and NPTCBC Correspondence providing evidence of agreement with the officers can be found in Appendix 3.
- ### Impacts
- 15.7.37 The distance from PRoW to turbines was considered a key aspect of the design evolution for the proposed development, with the aim to meet at least blade length from all registered footpaths and 200 m from registered bridleways. Such distances have been considered to be acceptable for other wind farm developments in the UK in relation to public safety, however it is recognised that each scheme is considered on its own merits.
- 15.7.38 The distance from each turbine to the nearest PRoW is shown in Table 15.4, based on the shapefiles provided by: NPTCBC for all PRoW within NPTCBC area; and publicly available shapefiles from NRW for PRoW within BCBC (shapefiles from BCBC were unobtainable however, PRoW officer from BCBC has confirmed that the routes shown on Figure 15.2 are correct).

³¹ The British Pilgrimage Trust, (2023). *St Illtyd's way*. Available from - <https://britishpilgrimage.org/portfolio/st-illtyds-way/> [Accessed 31/03/2023]

Table 15.4 Approximate distance from each turbine to the nearest PRow

| Turbine | Approximate distance to nearest PRow (m)* |
|---------|---|
| 1 | 194 (footpath) |
| 2 | 232 (footpath) |
| 3 | 130 (footpath) |
| 4 | 102 (footpath) |
| 5 | 93 (footpath) |
| 6 | 262 (footpath) |
| 7 | 104 (footpath) |
| 8 | 460 (footpath) |
| 9 | 300 (footpath) |
| 10 | 86 (footpath) |
| 11 | 106 (footpath) |
| 12 | 527 (footpath) |
| 13 | 738 (footpath) |
| 14 | 397 (footpath) |
| 15 | 102 (footpath) |
| 16 | 216 (footpath) |
| 17 | 475 (footpath) |
| 18 | 271 (footpath) |

Source: Coriolis and Natural Power

* All distances are approximate and have been measured on GIS using the most up to date data available from NPTCBC for land within NPTCBC area and NRW for land within BCBC area.

15.7.39 As per Table 15.4, a blade length distance (86 m) or greater is achieved for all public footpaths. In addition, all turbines are positioned at least 200 m from the nearest registered bridleway. The nearest registered bridleway to any turbine in the north section is ~ 206 m north-east of T4, and in the south section the nearest bridleway is ~ 984 m south-east of T11.

15.7.40 Although not a registered bridleway, and therefore not considered in the same way as PRows, all turbines except for T4, T5, T10 and T11 are able to meet a minimum distance of 200 m from the local authority recognised bridleway (North to South Dragon Ride). Distances to the four noted turbines are currently as follows:

- T4 ~ 118 m from route
- T5 ~ 102 m from route
- T10 ~ 132 m from route
- T11 ~ 91 m from route

Mitigation

15.7.41 During construction and decommissioning, as is the case with ongoing forestry operations, health and safety requirements will make it necessary to manage the use of PRow, permissive paths and recognised routes where they come within close proximity to infrastructure. It is likely that temporary closure orders will be required and arranged through consultation with the LPA's (indicatively as shown on Figure 15.3). Where possible temporary alternative routes will be provided, utilising existing forest roads where practicable. Prior to any temporary closures, notices will be posted in publicly available documents e.g. local media and the routes will be clearly marked with

warning signs to discourage the public from entering the construction area. The aim is to have temporary closure orders in place for as little time as possible without compromising the health and safety of members of the public.

15.7.42 During the operation of the wind farm, it is envisioned that there would be no restrictions placed on the movement of the public using the existing rights of way across the site, other than in exceptional circumstances e.g. turbine component replacement. During consultation, the PRow officers initially raised concern about potential ice throw risk to PRow users during the operational phase, however further information regarding ice throw was provided in a letter submitted to both LPAs 29th April 2022 (found in Appendix 3) that satisfied the concerns raised. See also Chapter 14 that also discusses ice throw.

Conclusions

15.7.43 To conclude, during the construction phase effects are not beyond those that are already in place or that will result from future forestry operations and are considered temporary in nature. Following the mitigation in the form of appropriately worded conditions addressing ice throw and permissive routes, low/negligible effects are expected during the operational phase on PRow, permissive paths and local authority recognised routes.

15.7.44 Inspection of some of the PRow onsite has also revealed that some are currently impassable due to dense forestry or challenging due to the poor ground conditions. The applicant will liaise with the PRow officers and NRW to discuss the reinstatement of PRow across the site which will enhance the users ability to enjoy the countryside (as part of the Access Management and Enhancement Plan outlined below). Any enhancements made will be in line with The Well-being of Future Generations (Wales) Act, 2015 which aims to improve the social, economic, environmental and cultural well-being of Wales.

15.7.45 To conclude, any direct impacts on PRow will be temporary during construction period, similar to during existing forestry practice when felling is in place. During the operational phase, mitigation for existing permissive and local authority recognised routes will be offered so that, for instance, users may be able to choose if they wish to be at a greater distance to the turbines. The applicant is also supportive of improving the current PRow present. Therefore, it is considered that the effect on PRow, permissive and local authority recognised routes is **not significant**.

Mountain Bike Trails

Baseline

15.7.46 The north-west of the north section forms part of the wider Afan Forest Park (AFP) complex, and benefits in particular from two world class mountain bike trails, being accessed typically from the visitor centre and tearooms at Cynonville: the Penhydd and Blue Scar trails, both last renovated in 2013.

15.7.47 Penhydd Trail is a 'classic' red graded 14.4km loop (estimated 1.5 hours duration), which combines with the Blue Scar to climb out of the visitor centre. It was originally opened in 2000 (then named "9feet.com") as the first purpose-built trail in AFP and was created by a group of volunteers. It was used for the World Singletrack Championships in 2001.

15.7.48 The trail was closed in 2010 due to harvesting and then reopened in 2013 with a refresh, but usage has reduced in recent years and it is considered to be in need of modernisation³².

15.7.49 Key sections include 'Out Bye', 'Pit Head', 'Bar Hook', 'Dig Deep', and 'Round the next Bend' on ascent (shared with Blue Scar), before splitting off left at 'The Top' to head via 'Desolation' to the top of the 'Big Dipper' descent, and then heading onto the next 'Sidewinder' descent leading all the way back eventually to the visitor centre.

15.7.50 Blue Scar is a blue graded 7km loop (estimated 1 hour duration), which after shared initial ascent with Penhydd splits right at 'The Top' to take the long 'Widow Maker' descent, via 'Hitchers & Ostlers', 'Mandrill', 'Nant Cynon' and 'In Bye', before arriving back at the visitor centre.

³² On the basis of knowledge and evidence shared by NRW with the applicant

15.7.51 The wider AFP consists of a number of other trails, including the Skyline Loop, Blade, W², White's Level, Y-Wal, and Rookie trails. The complex supports a community of local users but is also a magnet for mountain bikers from around the UK. As such, it provides a key draw for green tourism into the area.

15.7.52 While there are links to population and existing recreation centres at Maesteg and Margam Park (which has its own set of four graded trails) there are no similarly challenging trails providing a magnet for community interest within the south section.

Consultation

15.7.53 The scoping opinion from NRW relating to recreation routes notes:

'Section 20.3.4 – There are a number of illegal unauthorised mountain bike trails within the Bryn forestry block which will need to be identified and considered. This will have to be managed during the construction and operational phase of the proposed development.'

'Consideration should be given for all recreational needs, not just Public Rights of Ways. The Bryn is dedicated CRoW Act land which needs to be considered and managed as part of the proposal. Similarly, NRW allow permissive access for horse riding, cycling and general recreation (trail running).'

Impacts

15.7.54 With reference to Figure 15.3, it is anticipated that the approximately 2.3 km section of Penhydd Trail from 'The Top' via 'Desolation' will have to be closed on a temporary basis during construction for health and safety reasons.

15.7.55 There will be no direct impacts on usage of Blue Scar.

15.7.56 There will be similar closures to other forest roads outside of the official trails, which may also be used by mountain biking and other recreational users.

Mitigation

15.7.57 Mitigation for impacts to Penhydd Trail is illustrated on Figure 15.3, comprising a 1.8 km diversion turning right at 'The Top' via existing forest roads to climb to the start of 'Big Dipper' from the west, resulting a temporary net loss of 0.5 km distance to the trail. Signage and security measures will be installed, as indicatively shown on Figure 15.3, informing the public of the closure and keeping construction vehicles contained within defined parts of the site. The duration of closure will be kept to a minimum during the construction phase where at all possible, having regard to public health and safety. All closures will be agreed and communicated in line with the approved Access Management and Enhancement Plan (as outlined below).

Conclusion

15.7.58 Following mitigation, residual effects on mountain biking trails will be a minor (0.5 km out of 14.4 km) short-term (maximum estimated up to 24 months), temporary and reversible reduction in the length of the Penhydd Trail, which (taking enhancement commitments detailed below into account) would be substantially offset by the value of restoration and upgrade works. Effects are considered to be non-significant in EIA terms.

Outline Access Management and Enhancement Plan

15.7.59 It is proposed that an Access Management and Enhancement Plan (AMEP) will be prepared to indicate the restrictions for users during construction and any mitigation and enhancement measures. Final details will be confirmed post-consent through an appropriate planning condition, to be approved by NRW and the relevant LPAs, however areas expected to be covered in a draft which will be submitted with a final planning submission for the proposed development would include:

- Setting out overall objectives;
- Fully establishing the current context of access and use of the forests across the range of users;
- Acknowledge the boundaries of different responsibilities in relation to the AMEP, including in respect of health and safety legislation;
- Summarise potential impacts from construction and operation;
- Set out a range of agreed mitigation measures in relation to identified impacts;
- Present a number of agreed enhancement measures;
- Confirm how details for the mitigation and enhancement measures will be communicated to the public and other stakeholders; and
- Explain how the implementation and success of the AMEP will be measured and reviewed.

Enhancement

15.7.60 Working in collaboration with NRW (as land manager), the applicant has identified a number of measures that it commits to undertaking in pursuit of providing significant enhancement to recreational resources. Proposed measures (some of which being illustrated on Figure 15.4) include:

- Reinstatement of currently impassable PRowWs onsite, following planned harvesting schedules where relevant;
- Restoration of a number of sections of local offsite PRowWs, by agreement with PRow Officers and landowners;
- Restoration and upgrading sections of the Penhydd and Blue Scar trails, having regard to most current condition and usage reports, with as a minimum works to the 'Big Dipper' singletrack section to be completed prior to closures for construction;
- Ongoing maintenance for the 'Big Dipper' and 'Desolation' singletrack ways for the duration of the operation of the proposed development;
- Measures to promote and support greater use of e-Bikes within the site and local areas, including installation of a number of charging stations in locations agreed by NRW and local authorities, and designing any trail upgrades to be e-Bike friendly where possible;
- Exploring measures to provide and promote a strategic link between Afan Forest Park and Margam Park trails, through the southern "Bryn" block. The applicant has been liaising with 'Back on Track' (trail design specialists) in this regard.

15.7.61 All of the above noting that any positive works will themselves require temporary closures, which will require careful consideration and management under the AMEP.

15.7.62 The measures to be committed to above and others will be underwritten by an AMEP Fund.

15.7.63 The enhancement opportunities created by the AMEP and AMEP Fund would be supportive of the Well-being of Future Generations (Wales) Act 2015³³ - 'A healthier Wales'.

Communication Strategy

15.7.64 Information regarding impacts, mitigation and enhancement measures will be communicated to the public firstly through the approved AMEP document itself, which will be freely available from the relevant local authorities, from NRW, and on the project website (for so long as this exists). In addition to signage measures within the site, signage and information boards will be strategically located around the edge of the site and in the local area, including in particular at the visitor centre at Cynonville. NRW (as land manager) will be consulted on appropriate methods for disseminating information via various channels.

³³ Well-being of Future Generations (Wales) Act 2015. Available from - <https://www.futuregenerations.wales/wp-content/uploads/2017/01/WFGAct-English.pdf> [Accessed 31/03/2023]

15.8 CONCLUSIONS ON EXISTING INFRASTRUCTURE

- 15.8.1 The geographical area in and around the proposed development contains a variety of existing infrastructure. Infrastructure was identified through site surveys and consultation with consultees. Through the site evolution process impacts to existing infrastructure have been avoided and where they cannot be totally avoided have been mitigated.
- 15.8.2 The proposed development does not directly affect microwave fixed links or other radio communication networks and the potential effect is considered **not significant**. Pre-construction checks would be undertaken to ensure this still remains the case nearer the time of construction.
- 15.8.3 It is considered that there is no significant effects on gas, electricity and water supplies affected by the proposed development.
- 15.8.4 The potential risk to members of the public or staff arising from safety matters related to the proposed development is low and will be minimised through the construction phase through the site-specific AMEP (to be agreed post-consent). The ongoing maintenance regime and meteorological monitoring throughout the operational life of the proposed development, alongside provision of public notices about potential hazards and risks onsite, will further help to minimise ongoing safety risks through the proposed development's operational life.
- 15.8.5 The applicant is committed to improving public access to the site, therefore offering enhancement measures.