

15. Aviation

15.1 Introduction

- 15.1.1 This chapter of the EIA Report assesses the likely significant effects of the Proposed Development with respect to Aviation. This has been undertaken based upon assessment work provided by Wind Power Aviation Consultants (WPAC).
- 15.1.2 Prior to assessing the likely significant effects, this chapter summarises the relevant legislative and policy background, the methods used to determine likely significant environmental effects and the baseline conditions currently applicable to the Proposed Development. The likely significant effects associated with the Proposed Development are then established by comparison to the baseline conditions, along with proposed mitigation measures and the subsequent anticipated residual effects.
- 15.1.3 This chapter is not intended to be read as a standalone assessment and should be read in conjunction with the complete EIA Report and Appendices, particularly **Chapters: 1 – 4** and **Appendix 15A Aviation Assessment**.

15.2 Limitations of this Assessment

- 15.2.1 There are considered to be no limitations relating to aviation that affect the robustness of the assessment of the likely significant effects of the Proposed Development.

15.3 Relevant Legislation, Planning Policy, Technical Guidance

- 15.3.1 Planning policy at the national and local level and its relevance to environmental design and assessment is discussed in **Chapter 5: Planning Policy**, which includes a summary of the principal planning policies relevant to this chapter as listed below:
- The National Planning Framework 4 2023 (NPF4);
 - Argyll and Bute Local Development Plan 2 2024; and
 - Scottish Government Onshore Wind Policy Statement 2022.
- 15.3.2 Of specific relevance to the technical assessments provided in this EIA Report chapter, Policy 11(e)(iv) of National Planning Framework (NPF4) (2023) requires that in the determination of applications for energy infrastructure developments, the project design and mitigation should demonstrate how ‘impacts on aviation and defence interests including seismological recording’ are addressed. The Scottish Government’s Online Renewables Planning Advice regarding Onshore Wind Turbines (last updated 28th May 2014) includes guidance regarding potential impacts on aviation safeguarding and the need for civil and military aviation authorities to be consulted regarding proposed wind energy developments.
- 15.3.3 Policy 11 of the NPF4 requires renewable energy developments to consider a variety of matters that may be impacted by a proposal, including potential impacts on aviation and defence interests. The Scottish Government’s Online Renewables Planning Advice: Onshore Wind Turbines (2014) advises that civilian and military aviation interests should be taken into account, and consultation with relevant aviation interests is encouraged.

- 15.3.4 The Onshore Wind Policy Statement (2022) states within Chapter 6 (Onshore Wind and Aviation Considerations) that ‘wind turbines have the potential to impact aviation operations, including, but not limited to impact on aviation radar’. Solutions which have ‘alleviated specific individual objections’ have been agreed however, it is ‘...important that solutions are cognisant of the cost of deploying renewable energy, particularly given the need to focus on both security of supply and low-cost generation, given the current international and economic situation.’
- 15.3.5 Policy LDP 6 – Supporting the Sustainable Growth of Renewables of the Argyll and Bute Local Development Plan (LDP), which was adopted in 2015, states that ‘*All applications for wind turbine developments will be assessed against the following criteria:...Impacts on aviation and defence interests and seismological recording...*’.
- 15.3.6 Policy 30 – The Sustainable Growth of Renewables of the Argyll and Bute proposed Local Development Plan 2 (LDP2) requires that ‘*Applications for all wind turbine developments will be assessed against the following criteria:...Impacts on aviation and defence interests and seismological recording...*’.
- 15.3.7 Other advice and guidance are given in the following documents:
- Civil Aviation Publication (CAP) CAP 168 Licensing of Aerodromes, Ed 12 January 2022;
 - CAP 764 Civil Aviation Authority (CAA) Policy and Guidance on Wind Turbines, February 2016;
 - CAP 670 ATS Safety Requirements, May 2019;
 - CAP 774 UK Flight Information Services Version 4, Dec 2021;
 - CAP 738 Safeguarding of Aerodromes Version 3 October 2020;
 - CAP 793 Safe Operating Practices at Unlicensed Aerodromes, July 2010;
 - CAP 493 Manual of Air Traffic Services Part 1, Feb 2022;
 - CAP 660 Parachuting Version 5, March 2020;
 - Military Aviation Authority Traffic Management (3000 series) Regulatory Articles;
 - Military Aviation Authority Regulatory Article (RA) 2330: Low Flying, November 2014;
 - UK Military Aeronautical Information Publication (MIL AIP);
 - UK Aeronautical Information Publications (AIP); and
 - CAA 1:250,000 and 1:500,000 VFR Charts.

15.4 Consultation

- 15.4.1 In accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, **Table 15-1** provides an overview of relevant consultation written responses to the EIA Scoping Report, to establish the relevant baseline conditions for the Development Site.

Table 15-1 Summary of Relevant Consultation Undertaken to Date

Consultee(s)	Response	How points raised have been taken into account in EIA Report
Argyll and Bute Council (ABC) (Response to EIA Scoping Report, May 2023)	ABC note that aviation lighting will be required, and recommend that this, as well as any potential cumulative effects with other wind farms are fully assessed in accordance with the requirements of NatureScot.	The design will include aviation lighting and this is assessed in the EIA Report. An assessment of the effects of aviation lighting and identification of mitigation has been produced and is included section 15.8 and Appendix 15A.
Defence Infrastructure Organisation (DIO) – Ministry of Defence (MoD) (Response to EIA Scoping Report, July 2020 & July 2022)	The Defence Infrastructure Organisation (DIO) have advised that the Proposed Development will occupy Low Flying Area 14 and as such, the turbines will need to be fitted with MoD accredited aviation safety lighting in accordance with the requirements of the CAA Air Navigation Order 2016.	The effect on low flying in the vicinity of the Proposed Development has been assessed and reported in the Section 15.10. The design includes aviation safety lighting and the final turbine locations, and design will be shared with DIO. It is understood that this may be imposed as a planning condition. As of February 2024, the CAA have approved the lighting scheme proposed in this chapter.
Glasgow Prestwick Airport (GPA) (Response to EIA Scoping Report, July 2020 & June 2022)	Glasgow Prestwick Airport (GPA) have advised that the Proposed Development lies outside with the Airport's safeguarding area and as such GPA have no comment to make on the scoping consultation and would have no aviation grounds to object to this proposal should it come to a full Section 36 Planning Application.	Response is noted.
Highlands and Islands Airports (HIAL) (Response to EIA Scoping Report, July 2020)	HIAL state that its calculations show that, at the given position and height, the Proposed Development would not infringe the safeguarding criteria for any Highlands and Islands Airport. Therefore, HIAL has no objections to the proposal.	Response is noted.
National Air Traffic Services (NATS) (Response to EIA Scoping Report, July 2022)	Following an initial response in June 2020, NATS Safeguarding later advised that they anticipate that Turbine 8 of the EIA Scoping site layout will have an unacceptable impact on its radar.	The design has been revised since the NATS consultation response and Turbine 8 is no longer in that location. Further liaison with NATS will be undertaken as required to agree any necessary mitigation measures.

15.5 Scope of the Assessment

Potential Effects

15.5.1 The assessment is focused on the evaluation of the following effects:

- Potential effects on MoD Low Flying activities;
- Potential effects on NATS Lowther Hill Primary Surveillance Radar (PSR); and:
- Potential effects on NATS Tiree PSR.

MoD

- 15.5.2 As detailed in **Section 15.9**, the Proposed Development is located within the UKLFS Low Flying Area (LFA) 14.
- 15.5.3 Low flying is a demanding but essential skill for military aircrew, gained through progressive training and continuous practice within the UKLFS. The ability to operate effectively at low level by day and night is vital to fast jet, transport aircraft and helicopters as they support forces on the ground, and hence the UKLFS is a high value receptor. Therefore, potential effects on these receptors have been taken into account as part of the aviation assessment.

NATS

- 15.5.4 As detailed in **Section 15.9**, the Proposed Development is within the operational range of the NATS Lowther Hill PSR system, therefore potential effects on this receptor have been taken into consideration for the assessment.
- 15.5.5 As detailed in **Section 15.9**, the Proposed Development is within the operational range of the NATS Tiree PSR system, therefore potential effects on this receptor have been taken into consideration for the assessment.

Scoped Out

- 15.5.6 As the Proposed Development lies outside of the GPAs safeguarding area, no effects are predicted to occur and therefore GPA has been scoped out of further assessment.

Temporal Scope

- 15.5.7 The assessment of the potentially significant effects on aviation has been undertaken in relation to the construction, operational and decommissioning phases, in line with the general approach to the EIA approach in **Chapter 2**.

15.6 Environmental Measures

- 15.6.1 It is good practice to notify Aviation Stakeholders of the location and dimension of any wind energy development and the associated construction activities. Information regarding construction should be passed to the Defence Geographic Centre (DGC) and the General Aviation Awareness Council (GAAC) at least 10 weeks in advance of the erection of the first turbine with follow up confirmation on the day that the activity has taken place. The data should include:

- ▶ Location, height (of all structures) with a maximum height at or above 150ft agl, date of erection, name of location, an accurate location of the structures in WGS 84 latitude and longitude (degrees minutes and 1/100 second), an accurate maximum height agl/amsl, date of removal and lighting type (none, infra-red or lighting brightness);
- ▶ Local aerodromes identified during consultation should be notified, particularly any police helicopter or air ambulance units;
- ▶ RenewableUK should be copied-in on the submission of all such information as an independent record and because they might share the information with other relevant official agencies; and
- ▶ Appropriate information about the site construction and any associated lighting (where applicable), for example, the height and temporary location of construction cranes, should be provided to the UK Aeronautical Information Service (NATS AIS) for promulgation throughout the UK Integrated Aeronautical Information Package (UKIAIP) (NATS, 2023).

MoD

Construction

- 15.6.2 In Visual Meteorological Conditions¹ (VMC), pilots are ultimately responsible for seeing and avoiding obstructions such as wind turbines and would be aware through notification of construction activities. Pilots would plan their flying activities in advance to be familiar with any en-route obstacles that they may encounter. Appropriate information about the site construction and any associated lighting (where applicable), for example, the height and temporary location of construction cranes, would be provided, as per the notification requirements outlined in **Section 15.6.1**.

Operation

- 15.6.3 Pilots plan their flying activities in advance and are familiar with any en-route obstacles that they may encounter. Obstacle information and any associated lighting would be promulgated in the UKIAIP and Military Aeronautical Information Publication (AIP). During the flight, weather conditions or air space restrictions may necessitate route adjustments. However, pilots are ultimately responsible for seeing and avoiding tall structures, including wind turbines.
- 15.6.4 The Development Site is in an area where the MoD anticipates the construction of wind turbines is a concern due to an effect on military Low Flying operations.
- 15.6.5 In order to safeguard general use of the area by military aircraft during operation, the Applicant confirms that the Proposed Development turbines would be fitted with MoD accredited aviation safety lighting. The turbines would be fitted with 25 candela omnidirectional infrared lighting with an optimised flash pattern of 60 flashes per minute of 200ms to 500ms duration at the highest practicable point. This can be implemented under a suitably worded planning condition.
- 15.6.6 Agreement in respect of the MoD lighting requirement will be determined once the layout is finalised to confirm the MoD lighting requirements for air safety.

¹ Visual Meteorological Conditions (VMC): A flight category which allows flight to be conducted under visual flight rules defined by in flight visibility and clearance from cloud.

- 15.6.7 Information on the Proposed Development and construction infrastructure will be provided to the UK Aeronautical Information Service (AIS) and with the DGC such that it can be depicted on appropriate aviation documentation and charts as detailed in **Section 15.6.1**.

Decommissioning

- 15.6.8 In order to safeguard general use of the area by military traffic, the applicant will adhere to the notification requirements outlined in **Section 15.6.1**.

NATS

- 15.6.9 NATS has installed a replacement advanced radar system to replace the extant Lowther Hill PSR. The 'Indra' radar system is stated to possess inherent windfarm mitigation; however, it is not certain if the solution, that the 'Indra' radar capability provides, will be applicable to the Proposed Development.
- 15.6.10 As stated in **Table 15-1**, NATS Safeguarding originally advised that they anticipate that Turbine 8 in the Proposed Development will have an unacceptable impact on its radar. However, the site layout has changed since this response, resulting in only a minor marginal effect from T1 on the Lowther Hill radar. As such, NATS will need to be re-consulted. In the unlikely event NATS assume that T1 will unacceptably affect the radar, a simple 'single cell blank' mitigation should be available in order to sufficiently mitigate effects.
- 15.6.11 The Proposed Development is within the operational range of the NATS Tiree PSR system. All of the turbines will be screened by terrain from the radar, and are not predicted to have any effect on the performance of the Tiree radar.

15.7 Data Gathering Methodology

- 15.7.1 Potential aviation stakeholders were identified in accordance with the guidance in Civil Aviation Publication (CAP 764) Policy and Guidelines on Wind Turbines (CAA, 2016), with the suggested anticipated extents of impact utilised as a minimum. It is, however, acknowledged that objections from beyond the CAA recommended aviation stakeholder consultation distances can potentially be sustainable and valid; the threshold used for identifying potential aviation stakeholders is not a definitive limit on the extent of potential impacts arising from the Proposed Development.
- 15.7.2 Consideration is given to any aviation infrastructure where the Proposed Development lies within operational range of that infrastructure. Operational range varies with radar type or operations conducted and therefore the study areas are defined relative to a potential receptor on a case-by-case basis in this respect.
- 15.7.3 The radar line of sight (RLoS) analysis has been completed to model the terrain elevation profile between aviation radar systems of interest and the blade tips of the Proposed Development. This is a limited and theoretical desk-based study. In reality, there are variable levels of signal diffraction and attenuation within a given radar environment that can influence the probability of an operational turbine being detected. The analysis is designed to give an indication of the likelihood of the turbine being detected such that the operational significance of the wind farm relative to nearby aviation stakeholders can be assessed.
- 15.7.4 The RLoS analysis has been completed on the twenty-two turbine layout at a blade tip height of 200 metres (m) above ground level (agl).

15.8 Assessment Methodology

- 15.8.1 In order to predict and quantify the effects that would result from the Proposed Development, this assessment has considered:
- Baseline Conditions – a review of existing information in relation to existing aviation interests on the Development Site and local area.
 - Significance of Effects – an assessment of the effects of the Proposed Development against the baseline conditions and assessment of the cumulative effects of the Proposed Development with any other existing, consented (but not yet built) or proposed wind turbine developments for which applications have been submitted in the area.
 - Mitigation Measures – details of the proposed mitigation measures to be incorporated into the Proposed Development that would be implemented to avoid any significant impacts.
 - Residual Effects – an assessment of residual effects following the implementation of mitigation measures.
- 15.8.2 The generic project-wide approach to the assessment methodology is set out in **Chapter 2: EIA Approach**. However, whilst this has informed the general approach used in this assessment, standard aviation industry guidance has been taken into consideration for this assessment.
- 15.8.3 The methodology used to identify the aviation stakeholders as well as to assess the potential effects of the Proposed Development on the sensitive aviation receptors is summarised below.

Aviation Stakeholder Identification

- 15.8.4 A RLoS undertaken by WPAC considers the potential for the Proposed Development to have an effect on the aviation interests, in terms of the radar and operations of NATS. Airport operations at GPA were also considered but have subsequently been screened out of this assessment's scope. MoD low flying operations may be impacted by the creation of an obstruction within the UKLFS. There are no other aviation stakeholders that are considered to have the potential to be affected by the Proposed Development.
- 15.8.5 The analysis was conducted in accordance with CAP 764 (CAA, 2016). Potential aviation stakeholders were identified and for each receptor, the physical obstruction and / or radar impact, and then subsequently the operational effect, were evaluated. The operational effect pays heed to, but is not limited to, consideration of the orientation of airfield approach and departure routes, physical safeguarding of aircraft operations and airspace characteristics.

Radar Performance and Propagation

- 15.8.6 Radar performance and propagation modelling has been undertaken to determine the theoretical detection of operational wind turbines by the region's radar infrastructure. WPAC utilised their specialist propagation prediction software (RView Version 5), and verified results against the Shuttle Radar Topography Mission (SRTM) dataset. RView Version 5 models the terrain elevation profile between the identified PSR systems and blade tips of the wind turbine positions within the Proposed Development, to provide a graphical representation of the intervening terrain and theoretical direct RLoS, in order to determine the affected radar systems within the Baseline.

Assessment Guidance

- 15.8.7 The Aviation Industry and the provision of Air Navigation Services are regulated through extensive legislation, with the mechanism for wind development enabled through the consenting system and in accordance with regulatory guidance. The following policy and guidance documents were considered during the baseline definition and assessment activities:
- CAP 393 Air Navigation: The Air Navigation Order 2016 as amended (CAA, 2022);
 - CAP 764: CAA, Policy and Guidance on Wind Turbines (CAA, 2016);
 - CAP 785B: Implementation and Safeguarding of IFPs in the UK;
 - MoD Obstruction Lighting Guidance (MoD, 2020);
 - Other data sources and guidance considered during the baseline definition and assessment activities include the following:
 - CAA Visual Flight Rules Chart (CAA, 2022);
 - Military Aeronautical Information Publication (Mil AIP) (MoD, 2023);
 - MoD UK Low-Flying System (UKLFS) Priority Areas Map (MoD, 2011); and
 - CAA, CAP 032 UK Integrated Aeronautical Information Publication (UK AIP). The UK AIP is the main resource for information and flight procedures at all licensed UK airports as well as airspace, en-route procedures, charts and other air navigation information (NATS, 2023).

Significance Evaluation Methodology

Sensitivity Criteria

- 15.8.8 The sensitivity of a receptor is subjective in aviation terms and therefore difficult to quantify. Whereas an Air Defence Radar (ADR) system would be an obvious high value and high sensitivity receptor (due to its role in UK national security), the sensitivity of a local aerodrome can also often be rated high if the Planning Authority considers the receptor to be a significant asset to the local area. The identified receptors in this analysis are considered to have a high sensitivity to effects, given their safety critical function.

Magnitude Criteria

- 15.8.9 The assessment of the magnitude of the potential changes on aviation and radar receptors is assessed using the criteria and terminology given in **Table 15-2**.

Table 15-2 Magnitude of Change Criteria

Descriptor/Criteria	Description
High	Receptor unable to continue safe operations or safe provision of air navigation services (radar) in the presence of the wind turbines. Technical and/or operational mitigation of the effect is required.
Medium	Receptor able to continue safe operations but with some restrictions or non-standard mitigation measures in place.
Low	Receptor able to continue operations with standard mitigation in place.
Negligible	No impact on this receptor.

Significance of Effects Criteria

- 15.8.10 Significance criteria for aviation effects are typically difficult to establish. They are not strictly based on the sensitivity of the receptor or magnitude of change but on whether the industry regulations for safe obstacle avoidance or radar separation (from radar clutter) can be maintained in the presence of the wind turbines.
- 15.8.11 The anticipated effects have been informed by the results of the desktop assessment and additional consultation with reference to the existing evidence base regarding the effects of wind turbines on aviation receptors.

15.9 Baseline Conditions and Identification and Evaluation of Key Effects

- 15.9.1 Wind turbines have the ability to reflect radio waves and, therefore, have the potential to interfere with radar systems. Reflections from the rotating wind turbine blades may show up on radar as 'clutter'. Such effects could have an adverse impact on aircraft safety.
- 15.9.2 Consultation undertaken through the Scoping exercise identified that the key aviation and defence infrastructure interests relevant to the Proposed Development are as follows:
- Potential effects on Ministry of Defence (MoD) Low Flying activities; and
 - Conflicts with safeguarding criteria due to the potential impact on Lowther Radar identified by NATS.

MoD

- 15.9.3 There are no military airfields or Air Traffic Control (ATC) facilities within the Study Area.
- 15.9.4 The nearest air defence radar is located at Benbecula in the Outer Hebrides. RLoS is in excess of 1000m Above Ground Level (AGL).
- 15.9.5 The Proposed Development would be located within Low Flying Area (LFA) 14. This area is located 30km south of Oban and encompasses the vast majority of Northern and Central Scotland. It is within an area designated as 'Blue' by the MoD. A Blue area is defined as '*low priority military low flying area less likely to raise concerns*'.

- 15.9.6 The Defence Infrastructure Organisation (DIO) stated at Scoping that there are no radar objections but did state a 'concern' relating to low flying. In order to alleviate the concerns, they require *'the development be fitted with MoD accredited aviation lighting in accordance with the Air Navigation Order 2016'*.
- 15.9.7 The Applicant has proposed an aviation lighting strategy for the Proposed Development, see **Appendix 15A Aviation Assessment**. This assessment was produced by WPAC Ltd and considers the operational phase of the Proposed Development only.
- 15.9.8 Consulted in 2024

NATS

- 15.9.9 The Proposed Development lies under Class G regulated airspace - uncontrolled airspace in which aircraft can operate autonomously without any clearance required, subject to certain conditions. The Proposed Development is also close to the northern boundary of Class E regulated airspace – where aircraft are required to obtain the necessary clearance to operate from Air Traffic Control - designated as the Argyll Control Area (CTA). It is also designated as a Transponder Mandatory Zone (TMZ) which can reduce the reliance upon primary radar for separation purposes in the class of airspace.
- 15.9.10 The Proposed Development is within the operational range of the NATS Lowther Hill Primary Surveillance Radar (PSR) system – approximately 129 km to the nearest Turbine (3) - and NATS Tiree PSR system – approximately 106 km to the nearest Turbine (22).
- 15.9.11 The RLoS analysis undertaken by WPAC confirms that a turbine (T1) has a very small exposure to the radar at Lowther Hill (less than 2 metres) at a distance of almost 130km. This is within the error allowance for the digital terrain model used by WPAC. The radar modelling results are shown in **Table 15-3**, and further information can be found in **Appendix 15A**.

Table 15-3 Lowther Hill Radar

Turbine	RLoS (m AGL)	Turbine	RLoS (m AGL)
1	198.2	12	398.9
2	265.7	13	370.9
3	299.9	14	394.3
4	236.0	15	439.5
5	426.9	16	537.0
6	266.3	17	446.4
7	383.0	18	417.4
8	411.0	19	401.6
9	284.7	20	336.8
10	408.5	21	590.8
11	426.4	22	434.0

- 15.9.12 The RLoS analysis undertaken by WPAC confirms that all of the Proposed Development turbines will be screened by terrain from the Tiree radar and will have no effect on the performance of the Tiree radar. The radar modelling results are shown in **Table 15-4**.

Table 15-4 Tiree Radar

Turbine	RLoS (m AGL)	Turbine	RLoS (m AGL)
1	517.1	12	329.0
2	334.6	13	448.6
3	535.3	14	451.6
4	411.2	15	328.5
5	417.3	16	304.0
6	483.3	17	448.5
7	279.0	18	518.5
8	424.8	19	331.0
9	337.1	20	391.7
10	474.6	21	335.4
11	275.0	22	265.7

- 15.9.13 NATS stated at Scoping in relation to Lowther Hill that there would be ‘*an unacceptable impact from Turbine 8 on its radar*’. However, the site layout has changed (including turbine numbering) since Scoping. The radar modelling as shown in **Table 15-4** shows only a very small marginal effect from turbine T1. This is within the error allowance of the digital terrain model and at a distance of almost 130km it is considered that, subject to consultation with NATS, the impact upon Lowther Hill radar is unlikely to impact upon the performance of the radar operations.

- 15.9.14 Consulted in 2024

Glasgow Prestwick Airport

- 15.9.15 The PSR at Prestwick is located 87km south of the Proposed Development. The RLoS analysis undertaken by WPAC for the Prestwick PSR confirms that all of the Proposed Development turbines will be screened by terrain, and will have no effect on the performance of the Prestwick radar. The radar modelling results are shown in **Table 15-5**.

Table 15-5 Glasgow Prestwick Radar

Turbine	RLoS (m AGL)	Turbine	RLoS (m AGL)
1	994.4	12	790.1
2	955.7	13	820.4
3	940.3	14	836.8
4	939.5	15	824.2
5	907.1	16	753.5
6	901.2	17	819.1
7	795.3	18	818.7
8	820.6	19	818.7
9	904.4	20	862.0
10	844.3	21	868.1
11	741.1	22	941.7

15.9.16 GPA stated at Scoping 'On behalf of Glasgow Prestwick Airport (GPA) – the proposed development lies out with the Airport's safeguarding area and as such GPA have no comment to make on the scoping consultation and would have no aviation grounds to object to this proposal should it come to a full Section 36 Planning Application.'

Glasgow International Airport (GIA)

15.9.17 GIA did not provide comment at the Scoping stage as the Proposed Development is over 60km to the north-west of the airport. Radar modelling confirms that there is no impact to the radar at GIA (see **Table 15-6**).

Table 15-6 GIA Radar

Turbine	RLoS (m AGL)	Turbine	RLoS (m AGL)
1	739.4	12	368.0
2	621.8	13	395.8
3	539.2	14	512.9
4	710.3	15	396.4
5	339.3	16	562.7
6	569.6	17	433.6
7	358.4	18	474.4
8	438.1	19	546.8

Turbine	RLoS (m AGL)	Turbine	RLoS (m AGL)
9	692.5	20	452.4
10	307.7	21	580.3
11	425.2	22	553.8

Other Aviation Interests

- 15.9.18 Typically, where a site is within 20km of a meteorological radar the Met Office will undertake an operational assessment. The closest Met Office radar is at Holehead over 60km to the south-east. There will be no impact upon the Met Office radar network.
- 15.9.19 No non-radar equipped licenced aerodromes been identified in the vicinity of the Proposed Development. The closest non-radar equipped aerodrome is at Oban at a distance of 30km from the Proposed Development.
- 15.9.20 No unlicensed aerodromes, gliding facilities, hang gliding facilities and parachuting sites have been identified within the vicinity of the Proposed Development.

15.10 Cumulative Effects and Interaction of Effects

- 15.10.1 Cumulative impacts have not been raised by aviation and defence consultees. A cumulative assessment of aviation impacts has not been undertaken but it is considered that there will be **no significant** cumulative effects as a result of the Proposed Development.

15.11 Mitigation Measures

- 15.11.1 An iterative design process has been carried out with aviation related measures feeding into the site design process. For further information regarding the design process, please refer to **Chapter 3: Design Evolution and Alternatives**, and **Chapter 4: Description of the Proposed Development**.
- 15.11.2 An aviation lighting strategy has been prepared by WPAC to address the potential operational adverse effects of the Proposed Development and is included in **Appendix 15A**. The lighting arrangement combines CAA approved Air Navigation Order (ANO) visible lighting and MoD infra-red (IR) lighting. The resulting lighting strategy would therefore involve visible ANO lighting on thirteen turbines and IR lights on all turbines. ANO lighting produces medium intensity red light which is visible to the naked eye but is not visible to pilots flying on Night Vision Goggles (NVG). In contrast, the MoD compliant IR lighting is invisible to the human eye, but highly visible to pilots using NVG.
- 15.11.3 With these measures in place, it is anticipated that any potential operational effects on aviation would be satisfactorily mitigated. No potential construction effects on aviation were identified.
- 15.11.4 The visual impacts of the proposed lighting design have been assessed in **Chapter 8: Landscape and Visual**.

15.12 Residual Effects

- 15.12.1 Following implementation of mitigation through design and best practice and the mitigation measures identified above, it is considered that there would be **no significant** effects on aviation interests.

15.13 Conclusions of Significance Evaluation

- 15.13.1 This chapter has considered the potential for likely significant environmental effects on aviation arising from the Proposed Development. The design evolution process has taken into account the potential effects and has sought to minimise these as much as possible.
- 15.13.2 An aviation lighting scheme that conforms with the most recent CAA requirements and MoD guidelines has been prepared to address the requirements of the CAA for aviation lighting and the MoD with regard to low flying.
- 15.13.3 One turbine (T1) is marginally visible to Lowther Hill radar, but as this is within the margin of error of the digital terrain model and at a distance of almost 130km it is considered that, subject to consultation with NATS, this impact is **not significant**. Overall, therefore, **no significant** effects are predicted.

15.14 References

- Scottish Government (2023) National Planning Framework 4. Available at: <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2023/02/national-planning-framework-4/documents/national-planning-framework-4-revised-draft/national-planning-framework-4-revised-draft/govscot%3Adocument/national-planning-framework-4.pdf>
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