ScottishPower Renewables

Hare Hill Windfarm Repowering and Extension

Environmental Impact Assessment Report

Volume 1

Chapter 12: Aviation

November 2025

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Abbreviations

Abbreviation	Description
AD	Air Defence
AIP	Aeronautical Information Publication
amsl	above mean sea level
ANO	Air Navigation Order
APDO	Approved Procedure Design Organisation
ATC	Air Traffic Control
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CNS	Communication, Navigation and Surveillance
DAP	Directorate of Airspace Policy
DME	Distance Measuring Equipment
EIA	Environmental Impact Assessment
FL	Flight Level
ft	feet
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedures
ILS	Instrument Landing System
km	kilometre
MOD	Ministry of Defence
NATS	National Air Traffic Services
NERL	NATS (En Route) plc
nm	nautical miles
NSL	NATS (Services) Limited
PSR	Primary Surveillance Radar
RAF	Royal Air Force
RLoS	Radar Line of Sight
SSR	Secondary Surveillance Radar

TMA	Terminal Control Area
TOPA	Technical and Operational Assessment
UK	United Kingdom
VHF	Very High Frequency

12. Aviation

12.1. Statement of Competence

1. The aviation assessment has been led by Simon McPherson of Cyrrus Limited. Simon has a BEng and over 30 years' experience in the aviation sector, including 20 years as a flight inspector of airport and enroute navigation aids. At Cyrrus, Simon is responsible for all aspects of aviation technical safeguarding, from studying the effects of proposed developments on an airport's operation to assessing the impact of wind turbines on radar.

2. Simon has provided aviation expertise for numerous windfarm projects, both onshore and offshore. This has included technical modelling of radar impacts and potential mitigations, the drafting of aviation chapters and technical appendices, and consultation with civilian and military aviation stakeholders.

12.2. Introduction

3. This Chapter of the Hare Hill Windfarm Repowering and Extension (hereafter the 'proposed Development') Environmental Impact Assessment (EIA) Report describes and evaluates the baseline aviation interests in the vicinity of the Site (the area within the application boundary), including those of the United Kingdom (UK) Civil Aviation Authority (CAA), Ministry of Defence (MOD), NATS (comprising NATS (En Route) plc (NERL) and NATS (Services) Limited (NSL)), the Met Office, regional airports, local aerodromes, and other UK aviation stakeholders.

4. The potential impacts of wind turbines on aviation interests have been widely publicised and are outlined below:

    - physical obstruction: Turbines can present a physical obstruction at, or close to, an aerodrome or other aviation activity site such as a military low flying area;

    - Primary Surveillance Radar (PSR): Turbines can produce spurious/false returns known as "clutter". Turbine clutter appearing on a radar display can affect the safe and efficient provision of Air Traffic Services (ATS) as it can mask unidentified aircraft from the air traffic controller and/or prevent them from accurately identifying aircraft under their control and/or cause the track of the aircraft under control to be incorrectly reported. In some cases, radar reflections from the turbines can affect the performance of the radar itself;

    - Secondary Surveillance Radar (SSR): Turbine towers can obstruct and diffract SSR signals, but these effects are typically only considered when turbines are within 10 km of the facility. At greater ranges, SSR signals reflected from wind turbines can result in the radar generating a false target in a direction that is different to where the intended aircraft target is. Guidance on safeguarding distances varies with CAA recommending 10 km and NATS recommending 28 km (15 nautical miles (nm)); and

    - turbines can cause adverse effects on the overall performance of other Communication, Navigation and Surveillance (CNS) equipment.

12.3. Legislation, Policy and Guidance

12.3.1. Legislation

5. The Air Navigation Order (ANO) 2016/765 (CAA 2022) implements the UK's obligations under the Chicago Convention on International Civil Aviation and regulates aspects of aviation safety. It provides regulatory and enforcement powers for the CAA needed in respect of retained safety legislation. ANO Article 222 details the requirements for the lighting of enroute obstacles that are 150 m or more above ground level. Article 225A details the requirements for notifying the CAA of any planned works to erect new enroute obstacles that are 100 m or more above ground level.

12.3.2. Planning Policy

6. National Planning Framework 4 (Scottish Government 2023 (updated 2024)) sets out the national spatial strategy for Scotland. The Energy policy (Policy 11) states that project design and mitigation will demonstrate how impacts on aviation and defence interests are addressed.

7. Onshore Wind Policy Statement 2022 (Scottish Government 2022) acknowledges the potential impact of wind turbines on aviation operations. In response to consultation, the Onshore Wind Aviation Radar Delivery 2030 group has been formed to build on the co-existence between the onshore wind and aviation sectors through policy delivery and the implementation of technical solutions.

8. Civil Aviation Publication (CAP) 764: Policy and Guidelines on Wind Turbines (CAA 2016) details the CAA policy and guidelines associated with wind turbine impacts on aviation that aviation stakeholders and wind energy developers need to consider when assessing a development's viability.

12.3.3. Local Policy

9. Local Development Plan 2 (Dumfries and Galloway Council 2019), Policy IN2: Wind Energy states that the acceptability of windfarm proposals will be assessed, inter alia, against the impact on aviation and defence interests.

10. Wind Energy Development: Development Management Considerations Supplementary Guidance (Dumfries and Galloway Council 2020) provides further detail in support of aviation and defence considerations and also notes potential detrimental impacts from aviation warning lights.

11. Local Development Plan 2 Volume 01 (East Ayrshire Council 2024), Policy RE1: Renewable Energy includes impacts on aviation and defence interests in its assessment criteria.

12. East Ayrshire Landscape Wind Capacity Study (East Ayrshire Council 2024), Non-Statutory Planning Guidance considers the landscape and visual effects of wind turbine lighting.

12.3.4. Guidance

13. There are several documents which provide relevant guidance for assessing the impact of wind turbines on aviation and radar and these are listed below:

- CAP 032: UK Aeronautical Information Publication (AIP) (CAA 2025);
- CAP 168: Licensing of Aerodromes (CAA 2022);
- CAP 670: Air Traffic Services Safety Requirements (CAA 2019);
- CAP 738: Safeguarding of Aerodromes (CAA 2020);
- CAP 764: Policy and Guidelines on Wind Turbines (CAA 2016);
- CAP 774: UK Flight Information Services (CAA 2021);
- ANO 2016/765 (CAA 2022);
- Directorate of Airspace Policy (DAP) Policy 124: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level (CAA 2017);
- UK Military AIP (MOD 2025);
- MOD Obstruction Lighting Guidance (MOD 2020); and
- International Civil Aviation Organisation (ICAO) EUR DOC 015: European Guidance Material on Managing Building Restricted Areas (ICAO 2015).

12.4. Method of Assessment

12.4.1. Assessment

14. The assessment comprises a desk-based review of the location, technical characteristics and operational activities of aviation interests and operations in the vicinity of the Site using relevant data sources. The effects of the proposed Development have been assessed by modelling whether any of the proposed wind turbines would be in the line of sight of any aviation radar facilities, and whether the Site is in an area of operational importance to those radars. Evaluation of these effects also considered the response of aviation stakeholders to pre-application consultation. Full details of the assessment methodology and radar modelling are provided in **Technical Appendix 12.1: Aviation Impact Assessment**.

12.4.2. Study Area

15. In considering the spatial coverage of the aviation study area, the overriding factor is the potential for turbines to have an impact on civil and military PSRs, taking into account required radar operational ranges. In general, PSRs installed at civil and military airfields have an operational range of between 40 nm and 60 nm. All radar equipped airfields within 60 nm (111 km) of the proposed Development are therefore included in the study area. Enroute radars operated by NERL, and military Air Defence (AD) radars are required to provide coverage at ranges in excess of 60 nm and so all such radars with potential

Radar Line of Sight (RLoS) of the proposed Development turbines are also included in the study area.

16. Potential receptors considered within the study area are outlined in the following sections.

Civil Aerodromes

17. The CAA publication CAP 764: Policy and Guidance on Wind Turbines (CAA 2016) states the distances from various types of aerodromes where consultation should take place. These distances include:

    - aerodromes with a surveillance radar – 30 km;
    - licensed aerodromes where the wind turbines will lie within airspace coincidental with any published Instrument Flight Procedures (IFPs);
    - non-radar equipped licensed aerodromes with a runway of 1,100 m or more– 17 km;
    - non-radar equipped licensed aerodromes with a runway of less than 1,100 m – 5 km;
    - non-radar equipped unlicensed aerodromes with a runway of more than 800 m – 4 km;
    - non-radar equipped unlicensed aerodromes with a runway of less than 800 m – 3 km;
    - gliding sites – 10 km; and
    - other non-aerodrome aviation activity such as parachute sites and microlight sites – 3 km.

18. CAP 764 advises that these distances are for guidance purposes only and do not represent ranges beyond which all wind turbine developments will be approved or within which they will always be objected to. For example, aerodromes may utilise their radars at ranges considerably in excess of 30 km.

19. As well as examining the technical impact of turbines on CNS facilities, it is also necessary to consider the physical safeguarding of Air Traffic Control (ATC) operations using the criteria laid down in the CAA publication CAP 168: Licensing of Aerodromes (CAA 2022) to determine whether wind turbines will breach obstacle clearance criteria.

Ministry of Defence

20. MOD receptors under consideration within the study area include:

    - MOD airfields, both radar and non-radar equipped;
    - MOD AD radars; and
    - military aircraft engaged in low flying activities.

NERL Facilities

21. It is necessary to consider the possible effects of wind turbines upon NERL's UK-wide network of PSR and SSR facilities which provides enroute information for both civil and military aircraft.

Meteorological Radio Facilities

22. Wind turbines have the potential to adversely impact meteorological radio facilities such as weather radar. The Met Office must be consulted by developers of wind turbine proposals within a 20 km radius zone of any of their UK weather radar sites.

12.4.3. Data Sources

23. The primary sources of aviation related data used for the desktop study are the UK civil and military AIPs. The AIPs contain details on airspace and enroute procedures as well as charts and other air navigation information.

12.4.4. Impact Assessment Criteria

24. For the purposes of this assessment no detailed grading has been made of the magnitude of the impact or sensitivity of the receptor on the basis that any potential impact on aviation stakeholders that restricts operations is considered to be of significance.

12.5. Consultation

25. The relevant aviation stakeholders were consulted regarding the potential effects of the proposed Development as part of the scoping exercise. A summary of consultation is provided in Table 12.1.

Table 12.1 – Consultation Responses

Consultee	Summary of Consultation
Edinburgh Airport 11 December 2023	Edinburgh Airport confirmed that the proposed Development would lie outside its Aerodrome Safeguarding zone, and therefore it had no objection or comment.
Glasgow Airport 8 January 2024	Glasgow Airport observed that the proposed Development would lie outside its obstacle limitation surfaces and radar consultation area, but that it would be within IFP safeguarding areas and could have an impact.
Highlands and Islands Airports Limited 19 December 2023	Highlands and Islands Airports Limited noted that the proposed Development would be outwith its safeguarding criteria and therefore had no objections.
Prestwick Airport 12 December 2023	Prestwick Airport stated that the proposed Development would be outwith its controlled airspace but would lie on the Runway 30 extended centreline at a distance of between 17 and 19.5 nm. Issues identified included potential disruption to IFPs, potential for disruption to the Runway 30 Instrument Landing System (ILS), potential loss of Very High Frequency (VHF) ground to air communications in the vicinity of the proposed Development and turbines visible to the Airport's PSR causing turbine clutter on radar displays. The Airport

	also raised concerns in respect of cumulative impact due to other existing and proposed windfarms in the vicinity of the proposed Development.
MOD 12 January 2024	The MOD noted that the proposed Development would lie within Tactical Training Area 20T, a military low flying area, and that turbines have the potential to create a physical obstruction to low flying. The MOD would require consent conditions requiring the fitting of MOD accredited aviation safety lighting, together with sufficient data submitted to the MOD to ensure accurate charting of obstructions.
NERL 1 December 2023	NERL indicated it objects to the proposal and provided a Technical and Operational Assessment (TOPA) which predicted that all of the proposed turbines would be likely to cause false primary plots to be generated by Lowther Hill radar and that five or more of the proposed turbines would be likely to cause false primary plots to be generated by Great Dun Fell and Cumbernauld radars. This anticipated impact would be unacceptable to Prestwick Centre ATC operations.

12.6. Baseline

12.6.1. Airspace

26. The proposed Development lies below a volume of uncontrolled (Class G) airspace which extends from ground level to 5,500 feet (ft) above mean sea level (amsl). In uncontrolled airspace the responsibility to see and avoid other traffic and obstacles rests with the pilots in command of civilian and military aircraft and any ATS provided is essentially advisory.

27. Above the uncontrolled airspace is a portion of controlled (Class D) airspace known as the Scottish Terminal Control Area (TMA). Aircraft within Class D airspace are under a Radar Control Service. Clearance from the controlling authority is required to enter the controlled airspace and control instructions are mandatory. It provides a 'known traffic environment' in which ATC is aware of all traffic operating within the designated airspace. This airspace, specifically TMA 2, extends from 5,500 ft amsl up to Flight level (FL) 195 (standard atmospheric pressure equivalent to 19,500 ft amsl) and is managed by Scottish Control (NERL) based at NATS Prestwick Centre. The airspace contains IFPs associated with Prestwick, Glasgow and Edinburgh Airports, and lower ATS routes.

28. The published Area Minimum Altitude in the vicinity of the proposed Development is 4,100 ft amsl. This provides a minimum obstacle clearance of 1,000 ft above all obstacles within the specified area. With a maximum possible tip elevation of less than 2,400 ft amsl, the minimum clearance would be maintained above the proposed turbines.

29. As noted by the MOD in their consultation response, the proposed Development is located within a military low flying area known as Tactical Training Area 20T (Area 2B at night). Within Area 20T military aircraft may conduct low flying training down to 100 ft above the ground.

30. The airspace surrounding the proposed Development is described in greater detail in **Technical Appendix 12.1**.

12.6.2. Aerodromes

31. The nearest radar equipped aerodromes to the proposed Development are Prestwick Airport, 32 km to the north west, Glasgow Airport, 57 km to the north, north west and Edinburgh Airport, 77 km to the north east.

32. The nearest non-radar equipped licensed aerodrome to the proposed Development is Cumbernauld Airport, 65 km to the north, while the nearest minor aerodrome identified is the private airstrip at Benston Farm, 8 km to the north west. The closest known glider airfield is at Falgunzeon, 48 km south east of the proposed Development.

33. MOD West Freugh is the closest military radar equipped airfield to the proposed Development, 74 km to the west, south west. A non-radar military airfield, Royal Air Force (RAF) Kirknewton, lies 69 km north east of the proposed Development.

12.6.3. Enroute Radars and Navigation Aids

34. The closest NERL operated radars to the proposed Development are the combined PSR/SSR facilities at Lowther Hill (21 km east) and Great Dun Fell (127 km south east), and the PSR only facilities at Cumbernauld (61 km north) and Kincardine (80 km north, north east).

35. The closest NERL enroute navigation aid to the proposed Development is the Green Lowther Distance Measuring Equipment (DME) facility, 22 km to the east.

36. RAF Spadeadam is an Electronic Warfare Tactics facility approximately 100 km south east of the proposed Development. The Spadeadam Range is served by a PSR at Deadwater Fell (94 km east, south east) and a PSR/SSR at Berry Hill (102 km south east).

37. The closest MOD AD radar is at Brizlee Wood, 147 km east of the proposed Development.

12.6.4. Met Office Weather Radars

38. The closest Met Office weather radar to the proposed Development is located at Holehead in Stirlingshire, 70 km to the north.

12.7. Assessment of Potential Effects

12.7.1. Effects Scoped Out

39. Wind turbine effects on any civil and military PSRs during the construction phase are scoped out. To discriminate wanted aircraft targets from unwanted clutter, PSRs ignore static objects and only display moving targets. PSRs that can see the rotating blades of wind turbines can mistake them for aircraft and so present them on the radar display as clutter. Until turbine blades in RLoS are allowed to rotate, they will not generate PSR clutter.

40. Radar modelling, as detailed in **Technical Appendix 12.1**, indicates that the proposed wind turbines would not be in RLoS of the PSR facilities at Glasgow and Edinburgh Airports, or the NERL enroute PSRs at Cumbernauld and Kincardine. Similarly, the proposed turbines would not be in RLoS of the military PSRs at MOD West Freugh, Berry Hill, Deadwater

Fell and Brizlee Wood. Effects on these PSRs are scoped out as they would not detect the proposed wind turbines.

41. The proposed Development would be beyond the 20 km consultation zone radius of any weather radar sites, therefore effects on meteorological radio facilities are scoped out.

42. The closest SSR to the Site is the NERL facility at Lowther Hill. The proposed Development would be within the NATS recommended safeguarding distance of 28 km; however, NERL has not raised any concerns regarding SSR impacts and so effects on SSR are scoped out.

43. The proposed Development would be beyond the NATS recommended 10 km radius safeguarded zone around Green Lowther DME facility. The NERL TOPA states that no impact is anticipated on enroute navigation aids and so effects on Green Lowther DME are scoped out.

44. Edinburgh Airport has stated that the proposed Development would lie outside its Aerodrome Safeguarding zone. Effects on Edinburgh Airport and its published IFPs are therefore scoped out.

45. Prestwick Airport has identified disruption to the Runway 30 ILS as a potential issue. The ICAO document EUR 015: European Guidance Material on Managing Building Restricted Areas (ICAO 2015) details safeguarding criteria to protect the radio signals of CNS facilities from interference caused by buildings or other large objects such as wind turbines. For the Runway 30 ILS facility at Prestwick Airport the safeguarded zone extends to 6 km from the Runway 30 threshold. At more than 30 km from Prestwick Airport, the proposed Development is comfortably clear of the safeguarded zone and so potential effects on the ILS facility are scoped out of further assessment.

46. The proposed Development would be beyond the CAA stated consultation ranges for unlicensed aerodromes and glider sites. Effects on unlicensed aerodromes and glider sites are therefore scoped out.

12.7.2. Effects Scoped In

47. Radar modelling indicates that 21 of the 23 proposed wind turbines would be in RLoS of Prestwick Airport's Terma PSR. It is likely that Prestwick Terma PSR would detect at least 21 of the proposed turbines.

48. Radar modelling indicates that all 23 of the proposed wind turbines would be in RLoS of Lowther Hill PSR. It is likely that Lowther Hill PSR would detect all the proposed turbines.

49. Radar modelling indicates that all 23 of the proposed wind turbines would be in RLoS of Great Dun Fell PSR. It is likely that Great Dun Fell PSR would detect all the proposed turbines.

50. The presence of the proposed wind turbines may interfere with Prestwick Airport's VHF ground to air communications. Degradation of signal quality due to turbine related interference may have a detrimental effect on communication between the Airport's ATC personnel and aircraft flying in the vicinity of the proposed Development.

51. The proposed Development would lie within airspace that coincides with Prestwick Airport's and Glasgow Airport's published IFPs. An IFP is a set of instructions used by aircraft navigating at airports by reference to flight instruments. An IFP gives pilots reassurance of properly designated obstacle and terrain protection whilst manoeuvring in poor weather. Wind turbines infringing IFP protected surfaces would require the IFPs to be redesigned with higher minimum safe altitudes which could result in an impact on an airport's operations due to the potential reduction in aircraft being able to use the airport when weather deteriorates. The locations and tip heights of the proposed wind turbines have taken account of these IFP constraints; however, a full assessment must be undertaken by an Approved Procedure Design Organisation (APDO) to ensure that the IFPs at Prestwick and Glasgow airports would not be impacted by the proposed Development.

52. The proposed Development would be located in a military low flying area and the addition of wind turbines would introduce a physical obstruction for military aircraft engaged in low flying training.

12.7.3. Assessment of Effects

Prestwick Terma PSR, Lowther Hill PSR and Great Dun Fell PSR

53. Wind turbines that are in RLoS of PSRs create clutter on radar displays, impeding the ability of air traffic controllers to provide a safe and efficient ATS. The potential effect of the proposed Development on the operation of Prestwick Terma PSR, Lowther Hill PSR and Great Dun Fell PSR is considered to be **Significant**.

54. Prestwick Terma PSR is a windfarm tolerant radar that can be optimised to filter out clutter generated by wind turbines. Once the radar has been optimised for the proposed turbines there should be no subsequent requirement for re-optimisation or mitigation unless the turbine sizes or locations are changed. Application of the technical mitigation measures would mean a residual effect on Prestwick Terma PSR of **Not Significant**.

55. The PSR facility at Lowther Hill was replaced in September 2022 with a 3D PSR system with the capability to mitigate the impact of wind turbines by better filtering out the clutter the turbines generate. Optimisation of the Lowther Hill PSR to mitigate the impact of the proposed Development may be a feasible option. A potential further mitigation option would be to blank the area of clutter and use an infill radar feed that does not have RLoS of the proposed turbines. A suitable infill candidate would be Cumbernauld PSR which has minimum infill coverage of 3,500 ft amsl and is integrated into NERL's Multi-Radar Tracking infrastructure. Application of suitable technical mitigation measures would mean a residual effect on Lowther Hill PSR of **Not Significant**.

56. The impact of the proposed Development on Great Dun Fell PSR could be similarly mitigated by blanking the area of clutter and using infill radar data from Cumbernauld PSR. Should PSR optimisation prove to be a suitable mitigation for Lowther Hill PSR, then Lowther Hill cold also be used as a source of infill radar data for Great Dun Fell PSR. Application of suitable technical mitigation measures would mean a residual effect on Great Dun Fell PSR of **Not Significant**.

Prestwick Airport's VHF Ground to Air Communications

57. Degradation of Prestwick Airport's VHF ground to air communications, if any occurs, is likely to be restricted to low elevations in the immediate vicinity of the proposed Development, or to areas where VHF coverage is already marginal due to adverse terrain effects. Nevertheless, Prestwick Airport will not tolerate any loss of VHF communications and so the potential effect is considered to be **Significant**.

58. Any potential degradation of Prestwick Airport's VHF ground to air communications should be assessed by commissioning flight trials over the proposed Development before construction, to establish a baseline, and post construction. Should an adverse significant effect on VHF communications be determined in the vicinity of the proposed Development then technical mitigation could be implemented, such as the installation of VHF repeater stations in suitable locations to restore VHF coverage. With such mitigation in place, if required, the residual effect on VHF communications would be **Not Significant**.

Prestwick Airport and Glasgow Airport IFPs

59. Potential impacts on IFPs at Prestwick and Glasgow airport require to be assessed by an APDO; however, an IFP constraint map was used during detailed windfarm design to ensure that potential wind turbine locations and tip heights took account of protected IFP obstacle surfaces. IFP infringements are therefore not expected and the effect on Prestwick and Glasgow airport operations would be **Not Significant**.

Military Low Flying Aircraft

60. The proposed Development would introduce new physical obstructions into an environment within which military aircraft conduct low flying training down to heights of 100 ft above the ground. Unmitigated, the effect would be to compromise valuable military training activities and is considered to be **Significant**.

61. Wind turbines exceeding 150 m in height are required to have suitable aviation lighting installed in accordance with Article 222 of the ANO 2016/765 (CAA 2022) and DAP Policy 124 (CAA 2017). Visible lighting may be supplemented by infra-red lighting, as directed by the MOD. The CAA must be notified in writing of any enroute obstacle exceeding 100 m in height at least eight weeks prior to construction, in accordance with Article 225A of the ANO. The obstacle information is shared with NATS Aeronautical Information Services for publication of obstacles in the AIP and the MOD Defence Geographic Centre for inclusion on military aeronautical charts. The lighting and notification of the proposed wind turbine obstacles would mean a residual effect on military low flying aircraft of **Not Significant**.

12.8. Cumulative Effects

62. Prestwick Airport has raised concerns in respect of cumulative impacts due to other existing and potential future windfarms in the vicinity of the proposed Development. Without mitigation, multiple wind farms in close proximity could have adverse effects on radar performance and VHF communications across a wider area.

63. Other existing and future windfarms in the vicinity of the proposed Development could cumulatively create a physical obstruction for low flying aircraft across a wider area.

64. Following the implementation of suitable mitigations (as detailed in paragraphs 54, 55, 56, 58 and 61) the potential adverse cumulative effects would be reduced to levels considered to be **Not Significant**.

12.9. Mitigation and Residual Effects

65. Technical mitigation measures for impacts on PSRs (as detailed in paragraphs 54 to 56) are available that would mean residual effects on Prestwick Terma PSR, Lowther Hill PSR and Great Dun Fell PSR of **Not Significant**.

66. If deemed to be necessary, VHF repeater stations (see paragraph 58) would mitigate adverse effects on Prestwick Airport's VHF communications, leaving a residual effect of **Not Significant**.

67. Suitable aviation lighting (as detailed in paragraph 61) installed on the proposed wind turbines and the dissemination of obstacle information would mean a residual effect on military low flying aircraft of **Not Significant**.

12.10. Conclusions

68. The proposed Development would have a potentially **Significant** effect on the operation of Prestwick Terma PSR, Lowther Hill PSR and Great Dun Fell PSR. However, by implementing available technical mitigation measures these potential effects would be reduced to **Not Significant.**

69. The proposed wind turbines could generate multipath interference for Prestwick Airport's VHF communications. This would have a potentially **Significant** effect on the ability of ATC personnel and aircraft pilots in the vicinity of the proposed Development to communicate effectively but with implementing VHF repeater stations as mitigation this could be reduced to a **Not Significant** effect.

70. The final locations and heights of the proposed wind turbines would not, subject to APDO assessment, infringe protected IFP obstacle surfaces at Prestwick Airport and Glasgow Airport. Therefore, the operational effect would be **Not Significant**.

71. The proposed wind turbines would be physical obstructions that could potentially have a **Significant** effect on military low flying aircraft undertaking training activities in the vicinity. With the inclusion of aviation lighting installed on the proposed wind turbines, the residual effect would be reduced to **Not Significant**