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April 2026

Our reference: 1012102-01

Dear Neil,

RE: Baru & Marnda Renewable Energy Development - Wind Farm Preliminary Aviation Impact Assessment

Please find in this correspondence a preliminary aviation impact assessment of the proposed Baru and Marnda Renewable Energy Development Wind Farm Project (the Project) in Western Australia, which outlines possible development constraints due to aviation impacts. This analysis is based on the information provided in your email correspondence.

1.1. Project background

The Baru and Marnda Renewable Energy Development is located within the Shire of Ashburton Local Government Area (LGA), in Western Australia. The proposed WTGs will have a maximum tip height of 241 m above ground level (AGL). Two met masts of between 120 m and 160 m AGL are planned. Figure 1 shows an indicative location of the Project Site. (Source: Yindjibarndi Energy, Google Earth).

Yindjibarndi Energy has requested Aviation Projects to prepare a Preliminary Aviation Impact Assessment (AIA).

This Preliminary AIA assesses the likely impacts of the Project on aviation operations of up to 108 WTGs with a tip height of 241 m AGL, with highest planned WTG, WTG 99, with a ground elevation of 358 m AHD, and maximum tip height of 599.0 m AHD (1965.2 ft AMSL), and the planned met masts of up to 160 m AGL.

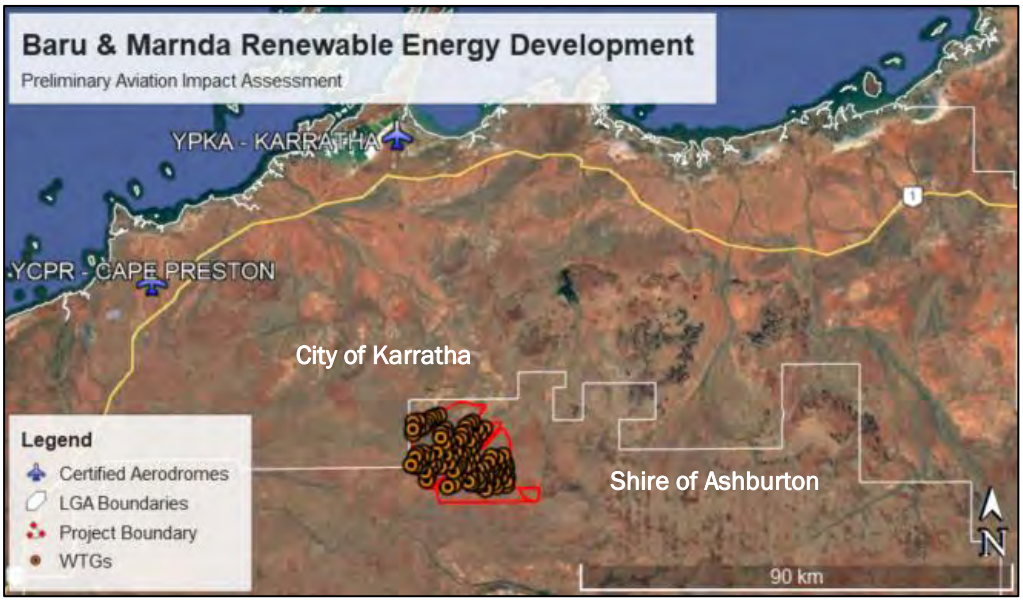


Figure 1 Project Site Overview

1.2. References

References used or consulted in the preparation of this report included:

- Airservices Australia
    - *Aeronautical Information Package (AIP)*, effective 9 July 2026
    - *Designated Airspace Handbook* and *Aeronautical Charts*, effective 9 July 2026
- Australian Government, Department of Infrastructure, Transport, Regional Development, Communications, Sports, and the Arts (DITRDCA), *National Airport Safeguarding Framework, Guideline D Managing the Risk to aviation safety of wind turbine installations (wind farms)/Wind Monitoring Towers*, dated July 2012
- Civil Aviation Safety Authority (CASA)
    - Advisory Circular (AC) 91-02 V1.2, *Guidelines for aeroplanes with MTOW not exceeding 5700 kg – suitable places to take off and land*, dated November 2022
    - AC 91-10 v1.7: *Operations in the vicinity of non-controlled aerodromes*, April 2026
    - AC 139.E-01 v1.0—*Reporting of Tall Structures*, December 2021
    - AC 139.E-05 v1.1 *Obstacles (including wind farms) outside the vicinity of a CASA certified aerodrome* (October 2022)
    - Civil Aviation Safety Regulations 1998 (CASR)
    - CASR Part 139 MOS– *Aerodromes*, Compilation No. 6, 11 December 2025
    - CASR Part 173 Manual of Standards (MOS) – *Standards Applicable to Instrument Flight Procedure Design*, version 1.8, 11 August 2022
- International Civil Aviation Organization (ICAO)
    - Annex 14—*Aerodromes*
    - Doc 8168 *Procedures for Air Navigation Services—Aircraft Operations* (PANS-OPS)
- OzRunways, aeronautical navigation charts extracts, April 2026
- Western Australia, Department of Planning, Lands and Heritage, *Position Statement: Renewable energy* facilities, March 2020
- Other references as noted.

1.3. Client material

Yindjibarndi Energy provided the following materials for this analysis:

- Baru_Marnda_AviationAssessment_KMLs_20260410.zip
- 20260410_Baru_Marnda_WTG_Metmast_Coordinates_Elevation.xlsx

1.4. Western Australia Department of Planning, Lands and Heritage (DPLH), *Position Statement: Renewable Energy Facilities* (March 2020)

The Western Australia Department of Planning, Lands and Heritage has published Position Statement: Renewable energy facilities (March 2020) on behalf the Western Australia Planning Commission. These guidelines provide advice to inform planning decisions about a wind energy facility proposal.

The DPLH have issued a draft Renewable Energy Planning Code and consultation closed on 10 April 2026. As this is in draft, the finalised requirements have not yet been determined.

The intent of the current Position Statement is to:

- Outline the Western Australian Planning Commission (WAPC) requirements to support the consistent consideration and provision of renewable energy facilities within Western Australia
- Identify assessment measures to facilitate appropriate development of renewable energy facilities.

The position statement applies to the preparation and assessment of planning instruments including regional and local planning schemes and strategies.

Section 5.3.1 *Community consultation* and Section 5.3.5 *Public and aviation safety* are relevant to this AIA and are extracted below:

> *Section 5.3.1 Community consultation*
>
> *Early consultation with the community and stakeholders by the proponents is encouraged to ensure that the proposal is compatible with existing land uses on and near the site. The local government should be consulted with respect to the community consultation program. Relevant stakeholders may include:*
>
> • *Air Services Australia ...*
>
> • *Civil Aviation Safety Authority ...*
>
> • *Department of Defence*
>
> • *Department of Fire and Emergency Services ...*
>
> *5.3.5 Public and aviation safety*
>
> *Proponents of wind turbine proposals should refer to the National Airports Safeguarding Framework (NASF) Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installation (Wind Farms) / Wind Monitoring Towers to determine any potential aviation safety risks and possible mitigation measures.*
>
> *Any potential aviation safety risks identified require consultation with Civil Aviation Safety Authority (CASA), Air Services Australia and/or the Commonwealth Department of Defence.*

The position statement defines a renewable energy facility as premises used to generate energy from a renewable energy source and includes any building or other structure used in, or relating to, the generation of energy by a renewable resource.

It is considered that the intent of the Position Paper will be met through the completion of an aviation impact assessment, including consultation with key aviation stakeholders.

1.5. Shire of Ashburton *Local Planning Scheme*

The Shire of Ashburton *Local Planning Scheme No. 7* (6 September 2022) provides requirements that apply to the vicinity of Onslow Airport.

The Project is more than 178 km (96 nm) from Onslow Airport so would not be restricted by this. land in the Scheme area relevant to aviation, shown in **Error! Reference source not found.**.

1.6. Aircraft operations at non-controlled aerodromes

Advisory Circulars (ACs) provide advice and guidance from CASA to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements. Advisory Circular (AC) 91-10 v1.7 *Operations in the vicinity of non-controlled aerodromes* provides guidance for pilots flying at or in the vicinity of non-controlled aerodromes, with respect to CASR 91.

A conventional circuit pattern and heights are provided in AC 91-10 v1.7. The standard circuit consists of a series of flight paths known as *legs* when departing, arrival or when conducting circuit practice. Illustrations of the standard aerodrome traffic circuit procedures provided in AC 91-10 v1.7, shown in Figure 2 and Figure 3.

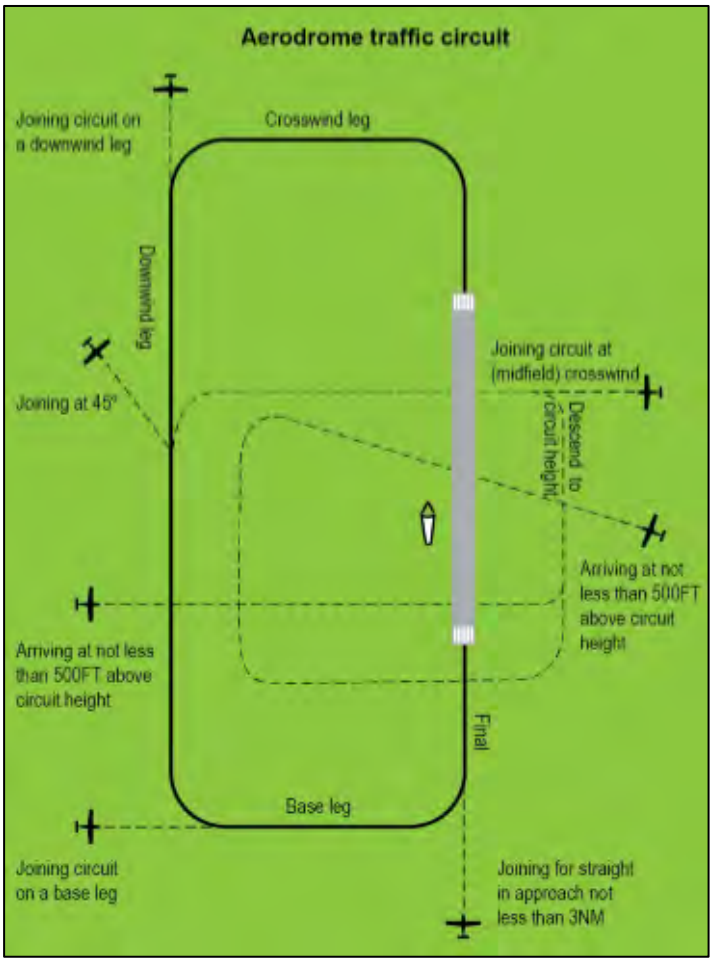


Figure 2 Aerodrome standard traffic circuit, showing arrival and joining procedures

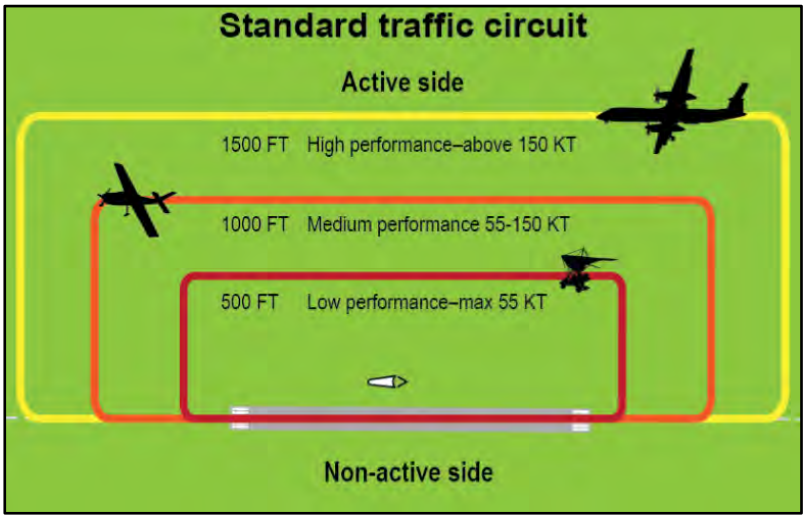


Figure 3 Lateral and vertical separation in the standard aerodrome circuit

AC 91-10 paragraph 7.11 refers to a distance that is "normally" well outside the circuit area and where no traffic conflict exists, which is at least 3 nm. The paragraph is copied below:

> *7.11 Departing the circuit area*
>
> *7.11.1 Aircraft should depart the aerodrome circuit area by extending one of the standard circuit legs or climbing to depart overhead. However, the aircraft should not execute a turn to fly against the circuit direction unless the aircraft is well outside the circuit area and no traffic conflict exists. This should be 500 ft or more above the circuit height and at last 3 nm from the departure end of the runway but may be less for aircraft with high climb performance. In all cases, the distance should be based on the pilot's awareness of traffic and the ability of the aircraft to climb above and clear of the circuit area.*

1.7. Rules of flight

1.7.1. Flight under Day Visual Flight Rules (VFR)

According to the Aeronautical Information Publication (AIP) the meteorological conditions required for visual flight in the applicable (class G) airspace at or below 3000 ft AMSL or 1000 ft AGL, whichever is the higher, are 5000 m visibility, clear of clouds and in sight of ground or water.

Civil Aviation Safety Regulation (1998) (CASR) 91.267 (Minimum height rules—other areas) prescribes the minimum height for flight. Generally speaking, and unless otherwise approved, aircraft are restricted to a minimum height of 500 ft AGL above the highest point of the terrain and any object on it within a radius of 300 m in visual flight during the day when not in the vicinity of built-up areas, and 1000 ft AGL over built-up areas (within a horizontal radius of 600 m of the point on the ground or water immediately below the aeroplane).

Flight below these height restrictions is also permitted in certain other authorised circumstances.

1.7.2. Night VFR

With respect to flight under the VFR at night, CASR 91.277 requires that the pilot in command of an aircraft flying VFR at night must not fly below the following heights (unless during take-off and landing operations, within 3 nm of an aerodrome or with an air traffic control clearance):

a) The published lowest safe altitude for the route or route segment (if any)

b) The minimum sector altitude published in the authorised aeronautical information for the flight (if any)

c) The lowest safe altitude for the route or route segment

d) 1,000 ft above the highest obstacle on the ground or water within 10 nm ahead of, and to either side of, the aircraft at that point on the route or route segment

e) The lowest altitude for the route or route segment calculated in accordance with a method prescribed by the Part 91 Manual of Standards for the purposes of this paragraph.

1.7.3. IFR (Day or night)

According to CASR Part 91, flight under the instrument flight rules (IFR) requires an aircraft to be operated at a height clear of obstacles that is calculated according to an approved method. Obstacle lights on structures not within the vicinity of an aerodrome are effectively redundant to an aircraft being operated under the IFR.

1.8. Aircraft operations

Flying training may be conducted under either the IFR or visual flying rules (VFR). Other general aviation operations under either IFR or VFR are also likely to be conducted at various aerodromes in the area.

Operations conducted under VFR are required to remain in visual meteorological conditions (VMC) (at least 5,000 m horizontal visibility at a similar height of the WTGs) and clear of the highest point of the terrain by 500 ft vertical distance and 300 m horizontal distance. In VMC, the WTGs will likely be sufficiently conspicuous to allow adequate time for pilots to avoid the obstacles. VFR operators will most likely avoid the Project Site once WTGs are erected.

Flight under day VFR is conducted above 500 ft above the highest point of the terrain within a 300 m radius unless the operation is approved to operate below 500 ft above the highest point of the terrain.

It is expected that the proposed WTGs will be sufficiently visually conspicuous to pilots conducting VFR operations within the vicinity of the Project Site to enable appropriate obstacle avoidance manoeuvring.

1.9. Nearby certified aerodromes

A certified aerodrome is an aerodrome regulated by the Civil Aviation Safety Authority (CASA) under Part 139 of the Civil Aviation Safety Regulations (CASR), with defined standards established in Part 139 (Aerodromes) Manual of Standards (MOS).

There are no Certified Aerodromes located within 30 nm (55.6 km) of the Project.

1.9.1. Obstacle Limitation Surfaces (OLS)

OLS are established for each certified aerodrome runway. The maximum extent of an OLS is up to 15 km from the runway.

The Project is outside the OLS protection areas for all certified aerodromes.

1.10. Grid and Air routes LSALT

CASR Part 173 MOS requires that the published lowest safe altitude (LSALT) for a particular airspace grid or air route provides a minimum of 1000 ft clearance above the controlling (highest) obstacle within the relevant airspace grid or air route tolerances.

1.10.1. Grid LSALT

The Project Site is located within an airspace grid with a LSALT of 3600 ft AMSL (1097.3 m AHD), which provides clearance above obstacles with heights up to 2600 ft AMSL (792.5 m AHD). A WTG's ground elevation plus WTG tip height higher than 792.5 m AHD (2600 ft AMSL) would infringe the Grid LSALT protection surfaces.

Error! Reference source not found. shows the grid LSALTs in proximity to the project site (source: Yindjibarndi Energy, AIP, OzRunways, Google Earth).

Based on an assumed maximum ground elevation of 358 m AHD (1174.5 ft AMSL) plus a WTG tip height of 241 m AGL, the WTGs would have a maximum tip height of 599.0 m AHD (1965.2 ft AMSL).

The eastern boundary of the Project Site is located in a Grid with an LSALT of 4300 ft AMSL (1310.6 m AHD), with a protection surface of 3300 ft AMSL (1005.8 m AHD). There are no planned WTGs within this Grid.

The WTGs would not infringe the Grid LSALTs.

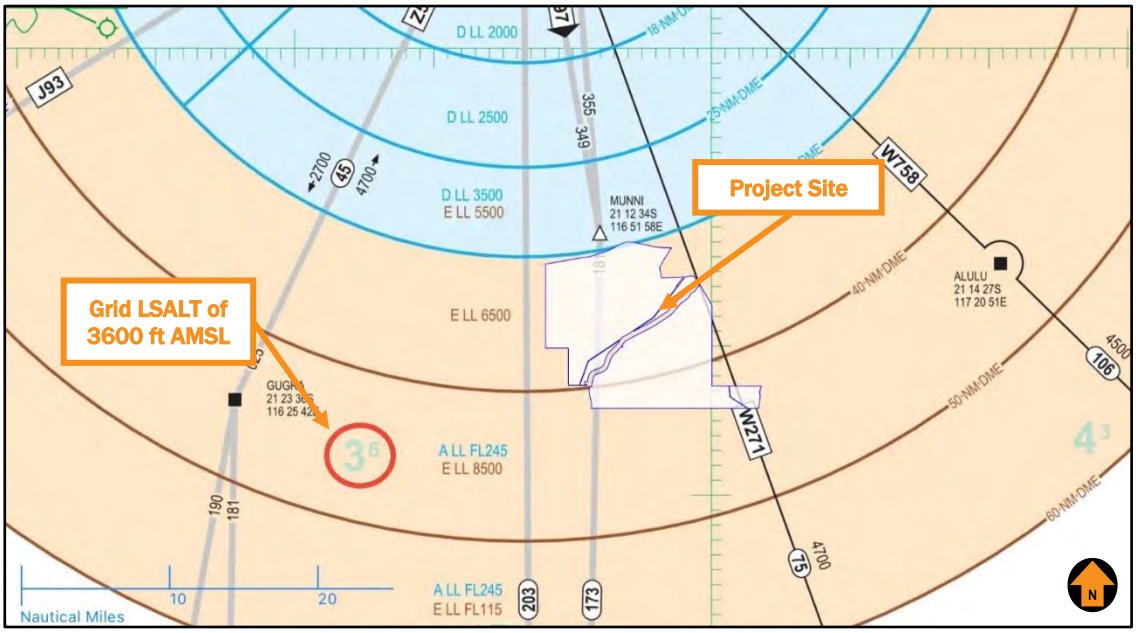


Figure 4 Grid LSALT in proximity to the Project site

1.10.2.Air Route LSALTs

A protection area of 7 nm laterally on either side of an air route is used to assess the LSALT for the air route. RNP2 routes have a protection area of 5 nm laterally on either side to assess the LSALT for the air route.

There are five air routes within the protection area of the Project Site. An impact analysis of the surrounding air routes is provided in the Table 1.

The highest WTG is 599.0 m AHD (1965.2 ft AMSL), which would be lower than all air routes' protection surfaces. Therefore, the WTGs would not impact any Air route LSALT.

Table 1 Air route impact analysis

Air route	*Waypoint pair*	*Route LSALT*	*Protection Surface*	*Impact on airspace design*	*Potential solution*	*Impact on aircraft ops*
W758	KA VOR HOOLI	4500	3500	Nil	N/A	N/A
Y97	KA VOR MUNNI	3600 (Grid)	2600	Nil	N/A	N/A
L514	OSOTO MUNNI	3600 (Grid)	2600	Nil	N/A	N/A
L514	MUNNI GUTLI	3600 (Grid)	2600	Nil	N/A	N/A
Y305	KA VOR GUTLI	3600 (Grid)	2600	Nil	N/A	N/A

1.11. Air space Protection

The Project is located in Class G airspace, which is uncontrolled airspace, and not in any Prohibited, Restricted or Danger areas.

Therefore, the Project would not impact on controlled or designated airspace.

1.12. Aviation communication, navigation and surveillance facilities

NASF Guideline G (*Protection Aviation Facilities - Communication, Navigation and Surveillance (CNS)*) and CASR Part 139 MOS 2019 specify the area where the development of buildings and structures has the potential to cause unacceptable interference to CNS facilities.

The proposed Project Site is not within the prescribed clearance zones or areas of interest specified in CASR Part 139 MOS and will not affect CNS facilities.

1.13. ATC Surveillance Radar Systems

Airservices Australia requires an assessment of the potential for the WTGs to affect the radar line of sight. Paraburdoo Radar Site is approximately 115 km south of the Project.

EUROCONTROL guidelines for assessing the potential impact on wind turbines on radar surveillance sensors stipulate the following assessment requirements:

Primary Surveillance Radar (PSR)

- Zone 1 0-500 m: Not permitted
- Zone 2 500 m – 15 km: Detailed assessment
- Zone 3: Further than 15 km but within maximum instrumented range and in radar line of sight: Simple assessment
- Zone 4: Anywhere within maximum instrumented range but not in radar line of sight or outside the maximum instrumented range: No assessment.

Secondary Surveillance Radar (SSR), includes En-route Surveillance Radar (RSR)

- Zone 1: 0 - 500 m: Not permitted
- Zone 2: 500 m - 16 km but within maximum instrumented range and in radar line of sight: Detailed assessment
- Zone 4: Further than 16 km or not in the radar line of sight: No assessment

(Zone 3 is not established for secondary surveillance radar)

The project site is outside the line-of-sight range and will not impact the radar facilities.

1.14. Nearby uncertified aerodromes

Uncertified aerodromes are not required to be listed or notified to CASA or Airservices Australia, leading to the potential for incomplete data regarding their operations and exact locations. They are not subject to CASR Part 139 regulations.

A search of aeronautical databases and publications was used to discover whether recognised uncertified aerodromes exist near the Project.

The aviation datasets used for the search are:

- AIP aeronautical charts effective 9 July 2026
- OzRunways – which sources its data from Airservices Australia. The aeronautical data provided by OzRunways is approved under CASR Part 175

As a guide, an area of interest within a 3 nm radius of an uncertified aerodrome is used to assess the potential impacts of proposed developments on aircraft operations at or within the vicinity of the aerodrome. Known uncertified aerodromes in relation to the Project are shown in **Error! Reference source not found.**.

There are no known uncertified aerodromes within 3 nm of the proposed WTGs.

1.15. Potential wake turbulence impacts

National Airports Safeguarding Framework (NASF) Guideline D – *Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers* provides guidance to State/Territory and local government decision makers, airport operators and developers of wind farms to jointly address the risk to civil aviation arising from the development, presence and use of wind farms and WMTs.

NASF Guideline D provides guidance regarding WTG wake turbulence which states:

> *Wind farm operators should be aware that wind turbines may create turbulence which noticeable up to 16 rotor diameters from the turbine. In the case of one of the larger wind turbines with a diameter of 150 metres, turbulence may be present two kilometres downstream. At this time, the effect of this level of turbulence on aircraft in the vicinity is not known with certainty. However, wind farm operators should be conscious of their duty of care to communicate this risk to aviation operators in the vicinity of the wind farm…*

The key wording in the NASF guidance is "*noticeable*" and that "*the level of turbulence in the vicinity is not known with certainty.*"

There are many situations in aviation where pilots "notice" their aircraft moving away from the desired flight path or altitude and take appropriate action to maintain control of the aircraft with minimal input.

Pilot training standards are regulated by CASA to ensure that all qualified pilots have demonstrated to a suitably qualified and authorised check pilot that they can maintain control of their aircraft along the chosen flight path, across a significant range of atmospheric conditions that cause the aircraft to deviate from the pilot's chosen flight path.

Aircraft are designed to withstand a significant variation in atmospheric disturbances to ensure airframe integrity is maintained. The limits of the airframe's integrity are known by the pilot and considered in every flight activity. Significant weather events such as thunderstorms are avoided because of the likelihood of airframe limits being exceeded by the strong wind shear type conditions within, beneath and surrounding thunderstorm cells.

Wind turbines have been assessed in a limited number of studies, in which the highest classification of hazard is considered to be medium only within approximately 7 rotor diameters (RD) downwind of the wind turbine. There are no assessments that consider that the downwind turbulence is significant and outside the ability of the aircraft to endure the impacts and for the pilot to be able to control the aircraft using normal control inputs.

There also have been no reported aircraft accidents or incidents involving an aircraft encounter with the turbulence downwind of a wind turbine.

Assessment

A 182 m rotor diameter has been used for the wake turbulence analysis. Based on this scenario, NASF Guideline D suggests the effects of wake turbulence could be noticeable from the WTGs within 2912 m of the runway and the nominal circuit area, depending on wind direction.

There are no known aerodromes within 16 RD (2912 m) of the WTGs, therefore the potential wake turbulence impacts from the WTGs on aviation is limited.

1.16. Summary

Following a high-level evaluation of the aviation operations aspects of the Project Site, Aviation Projects has concluded:

- There are no certified aerodromes located within 30 nm of the Project Site:
    - The Project would not infringe the OLS of any certified aerodrome
    - The Project would not infringe any PANS-OPS surfaces
- The Project would not infringe the grid LSALT.
- The Project would not impact on any air routes LSALT.
- The Project Site would be located within Class G airspace, which is uncontrolled airspace, and not within any Protected, Restricted or Danger Areas.
- The Project Site would not impact the aviation communication, navigation or surveillance facilities.
- The Project Site would not impact ATC surveillance radar installations.
- The Project Site must be reported to CASA, and construction details must be provided to Airservices Australia.
- There are no known uncertified aerodrome identified within 3 nm of the Project WTGs.

When the final WTG layout and information are ready, a detailed analysis in an Aviation Impact Assessment (AIA) can be performed.

The AIA would include an aviation impact statement (AIS) as required by Airservices Australia, a site visit to inform the AIA, qualified risk assessment to determine the need for obstacle lighting, identify stakeholders for consultation, complete consultation and include any necessary or suggested actions,

Consultation with Airservices Australia and the Department of Defence would be required as part of the consultation process to allow them to conduct their assessment and confirm any impacts identified.

If you wish to clarify or discuss the contents of this correspondence, please contact me at 07 3371 0788.

Kind regards



Kate Madden

Specialist Aviation Consultant

20 April 2026