

- Approach Procedures;
- Circling Procedures;
- Minimum Sector Altitude Procedures; and
- Lowest Safe Altitudes (LSALT) for nearby air routes.

**BALLARAT**

<b>APPROACH PROCEDURE</b>	<b>IMPACT/COMMENTS</b>
RWY 36 NDB	The development is located outside the protection surfaces. No impact.
RWY 18 RNAV(GNSS)	The development is located outside the protection surfaces. No impact.
RWY 36 RNAV (GNSS)	The development is located outside the protection surfaces. No impact.
25NM MSA	The development is located 78m (256ft) below the lowest protection surface of 645m (2116ft). No impact.
CIRCLING PROCEDURES	The development is located outside the circling area surfaces. No impact.

*Table 6-1 Non Precision Approach Procedures - Ballarat*

**YARROWEE NDB**

<b>APPROACH PROCEDURE</b>	<b>IMPACT/COMMENTS</b>
NDB or VOR	The development is outside the protection surface. No impact.
25NM MSA	The development is 380m (1245ft) below the protection surface of 947m (3106ft). No impact.
CIRCLING PROCEDURES	There is no aerodrome associated with this procedure so there are no Circling Areas.

*Table 6-2 Non Precision Approach Procedures – Yarrowee NDB*

**AIR ROUTE - LSALTS**

<b>AIR ROUTE</b>	<b>IMPACT/COMMENTS</b>
W306 – LSALT 4700ft	The development is 560m (1838ft) below the protection surface of 1127m (3700ft). No impact.
W291 – LSALT 4700ft	The development is 560m (1838ft) below the protection surface of 1127m (3700ft). No impact.
H345 – LSALT 4700ft	The development is 560m (1838ft) below the protection surface of 1127m (3700ft). No impact.
W245 – LSALT 4100ft	The development is 378m (1240ft) the protection surface of 945m (3100ft). No impact.
W191 – LSALT 4100ft	The development is 378m (1240ft) the protection surface of 945m (3100ft). No impact.
V223 – LSALT 4100ft	The development is 378m (1240ft) the protection surface of 945m (3100ft). No impact.
GRID LSALT 4700ft	The development is 560m (1838ft) below the protection surface of 1127m (3700ft). No impact.

*Table 6-3 Air Route – LSALTS*

## **7 CONTINGENCY PROCEDURES – ENGINE INOPERATIVE FLIGHT PATHS**

In the context of the operations in the area of the proposed wind farm development and the physical environment, the proposed Stockyard Hill Wind Farm is considered as not having an impact on contingency procedures in the area.

## **8 OTHER ISSUES**

### **8.1 Radar Interference and Shadowing**

Radar interference and shadowing was assessed in accordance with CASR Part 139 Manual of Standards. The Stockyard Hill Wind Farm proposed development is located outside the clearance zones associated with ATC Radar Facilities.

### **8.2 Potential Impact on Airport Navigation Aids**

Potential impact on airport navigational aids was assessed in accordance with CASR Part 139 Manual of Standards. The Stockyard Hill Wind Farm development is located outside the clearance zones associated with aviation Navigation Aids.

### **8.3 Future Developments**

It is unlikely that any future developments of the PANS OPS surfaces at Ballarat will be affected by this wind farm due to the north-south runway configuration at Ballarat and populated areas surrounding Ballarat.

Any future development of Instrument Approach Procedures at other airfields within 55.6 KM (30NM) of the wind farm will be required to take the wind farm characteristics into account during the design process.

### **8.4 Reporting of Tall Structures**

As the proposed wind farm contains wind turbines which will exceed 110m AGL, the developer is required to inform CASA of the development in accordance with AC 139-08(0) and AC 139-18(0).

## 9 CONCLUSION

This aeronautical assessment was conducted in accordance with the relevant aviation and aeronautical regulations and standards to consider the potential impacts of the proposed Stockyard Hill Wind Farm on the safety of aircraft and airport operations.

The study concludes that the highest turbine in this proposed wind farm is 567m/1860ft AMSL and as such:

- will not penetrate any OLS surfaces;
- will not penetrate any PANS OPS surface;
- will not have an impact on nearby Air Routes;
- will not have an impact on local aviation activities;
- will require notification to CASA under Reporting of Tall Structure requirements; and
- will require evaluation of obstacle marking and lighting requirements.

The proposed Stockyard Hill Wind Farm development has been assessed as not having an impact on prescribed airspace and is therefore considered approvable in accordance with the relevant regulations.

This Aeronautical Study can be used as supporting documentation to an application to CASA using CASA Form 406 – Operational Assessment of Existing and Proposed Structures.

As the height of the turbines exceed 110m AGL, it will be necessary to notify CASA in accordance with Advisory Circular AC 139-08(0) “Reporting of Tall Structures”.



**APPENDIX A**  
**PANS OPS ASSESSMENT WORKSHEET**



**APPENDIX A**  
**PANS OPS ASSESSMENT WORKSHEET**  
**BALLARAT AIRPORT OBSTACLE ASSESSMENT**  
**YARROWEE OBSTACLE ASSESSMENT**  
**STOCKYARD HILL WIND FARM**  
**AMBIDJI - J0268**

**Date: 31 October 2008**

**DAP EFF DATE: 28 AUGUST 2008**

<b>OBSTACLE DETAILS</b>	
Location	The site is located approximately 4.5 km south of Beaufort, 5 km North of Skipton and 35 km west of Ballarat township.
Altitude (M/FT)	<b>MAX ALT = 567 M (1860ft) AHD</b>

<b>MINIMUM SECTOR ALTITUDE - BALLARAT</b>				
	MDA	MOC	PANS OPS SFC ALT (FT)	RESULT
25NM MSA South West	3100	984	2116	WIND FARM MAX ALT IS 256ft (SW) AND 1856ft (NW) BELOW THE PANSOPS SFC.
25NM MSA North West	4700	984	3716	
25NM MSA East	4000	984	3116	WIND FARM IS OUTSIDE PANSOPS SFC.
10NM MSA	3700	984	2716	

<b>MINIMUM SECTOR ALTITUDE - YARROWEE</b>				
	MSA	MOC	PANS OPS SFC ALT (FT)	RESULT
25NM MSA	4000	984	3016	WIND FARM MAX ALT IS 1156ft BELOW THE PANSOPS SFC.

<b>CIRCLING PROCEDURES - BALLARAT</b>				
CAT	MDA (ACT QNH)	MOC	PANS OPS SFC ALT (FT)	RESULT
A/B (4.9KM)	2200	295	1905	WIND FARM IS OUTSIDE PANSOPS SFC.

Appendix

<b>NON-PRECISION APPROACH PROCEDURES (NPA) - BALLARAT</b>				
	<b>MDA (ACC QNH)</b>	<b>MOC</b>	<b>PANS OPS SFC ALT (FT)</b>	<b>RESULT</b>
<b>NDB RWY 36</b>	2110	246	1864	<b>WIND FARM IS OUTSIDE PANSOPS SFC</b>
<b>RNAV (GNSS) RWY 18</b>	2140	246	1894	<b>WIND FARM IS OUTSIDE PANSOPS SFC</b>
<b>RNAV (GNSS) RWY 36</b>	1960	246	1714	<b>WIND FARM IS OUTSIDE PANSOPS SFC</b>

<b>NON-PRECISION APPROACH PROCEDURES (NPA) - YARROWEE</b>				
	<b>MDA (ACC QNH)</b>	<b>MOC</b>	<b>PANS OPS SFC ALT (FT)</b>	<b>RESULT</b>
<b>NDB or VOR</b>	2750	294	2456	<b>WIND FARM IS OUTSIDE PANSOPS SFC</b>