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Civil Aviation Safety Authority
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# Preliminary Airspace Review
# Bundaberg Airport, QLD

January 2019

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# 1 EXECUTIVE SUMMARY

1.0.1 The *Airspace Act 2007* (Act)[1] provides the Civil Aviation Safety Authority (CASA) with the authority to administer and regulate Australian-administered airspace and obligates CASA to conduct regular reviews of the existing classifications of Australian–administered airspace. The Office of Airspace Regulation (OAR) conducted a review of the airspace arrangements and classifications within a 20 Nautical Mile (NM) radius, up to 5,000 feet above mean sea level, of Bundaberg Airport to determine if the airspace remains "fit for purpose".

1.0.2 This review is consistent with CASA's regulatory philosophy which considers the primacy of air safety, but also considers all other relevant factors, including cost.

1.0.3 Assessment of the airspace movements, occurrences and stakeholder feedback were considered, and it was concluded that risk was As Low as Reasonably Practicable (ALARP). Minimal industry feedback was received, and that which was did not indicate any concerns with the airspace.

1.0.4 The OAR has determined that the current airspace architecture is fit for purpose with respect to current operations, as well as being suitable to accommodate the projected growth contained within the Bundaberg Airport Master Plan.[2]

## Recommendations:

The following recommendations have been made:

- Recommendation: The airspace with 20 NM of Bundaberg should remain unchanged.
- Recommendation: Request that CASA's Aviation Safety Advisors include awareness training regarding radio shielding from terrain and buildings as part of their safety seminars.

[1] A full list of acronyms and abbreviations used within this report can be found at Annex B.

[2] http://www.bundaberg.qld.gov.au/files/Bundaberg_Airport_Master_Plan_May_2016_combined.pdf

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# 2 INTRODUCTION

2.0.1 Under Section 11 and 12 of the *Airspace Act 2007 (*Act), the Civil Aviation Safety Authority (CASA) has responsibility for the administration and regulation of Australian-administered airspace. In carrying out these responsibilities CASA must give primacy to aviation safety and must:

- foster efficient use of Australian-administered airspace;
- foster equitable access to that airspace for all users of that airspace;
- take into account national security; and
- take into account protection of the environment.

2.0.2 CASA previously conducted an Aeronautical Study of Bundaberg in 2009. Given the time since this last assessment, it was deemed appropriate that the OAR conduct this review of Bundaberg Airport (Bundaberg).

## 2.1 Purpose

2.1.1 The purpose of the Preliminary Airspace Review is to assess the airspace architecture and aircraft activity within the vicinity of Bundaberg. The assessment considered airspace extending on a radius of 20 Nautical Mile (NM) from Bundaberg and from the surface to 5,000 feet (ft) above mean sea level (AMSL). The review was able to determine if the airspace complies with the requirements of the Act for safe operations, efficiency and equitable access. The review provides findings and recommendations about matters that impact aviation safety, efficiency or equitable access for airspace users.

## 2.2 Process

2.2.1 The review process included:

- analysis of aircraft movement data;
- analysis of the mix of aircraft operations in the area;
- assessment of current aircraft movement levels and mix of aircraft operations to determine the suitability of existing airspace;
- assessment of the appropriateness of the current airspace classifications and architecture;
- assessment of any issues related to aircraft operators seeking equitable access;
- assessments of the appropriateness of the Air Traffic Services (ATS) provided in each class of airspace;
- identification of any threats or risks to the safety of aircraft operations; and
- consultation with airspace users.

## 2.3 Scope

2.3.1 The scope of this review is limited to the airspace within 20 NM of Bundaberg and below 5,000 ft AMSL. The review did not assess operational matters or infrastructure issues.

# 3 BACKGROUND

## 3.1 Overview of Australian airspace classifications

3.1.1 Australian airspace classifications accord with Annex 11 of the International Civil Aviation Organization (ICAO) and include Class A, C, D, E, and G depending on the level of service required to safely and effectively manage aviation activity. Class B and Class F airspace is not currently used in Australia. Each class of airspace determines the type and nature of aviation operations permitted in that airspace. Annex B provides details of the classes of airspace used in Australia.

## 3.2 Bundaberg Airport

3.2.1 Bundaberg is a security-controlled, certified aerodrome operated by the Bundaberg Regional Council. The airport has one asphalt runway (RWY 14/32) with an unsealed crossing runway (RWY 07/25) and no Aerodrome Rescue and Fire Fighting (ARFF) service. Bundaberg is equipped with a Non-Directional Beacon (NDB) and an Aerodrome Frequency Response Unit (AFRU).

3.2.2 No precision instrument approaches are available at Bundaberg, however a Global Navigation Satellite System (GNSS) arrival as well as Area Navigation (RNAV) approaches to RWYs 14 and 32 are available.

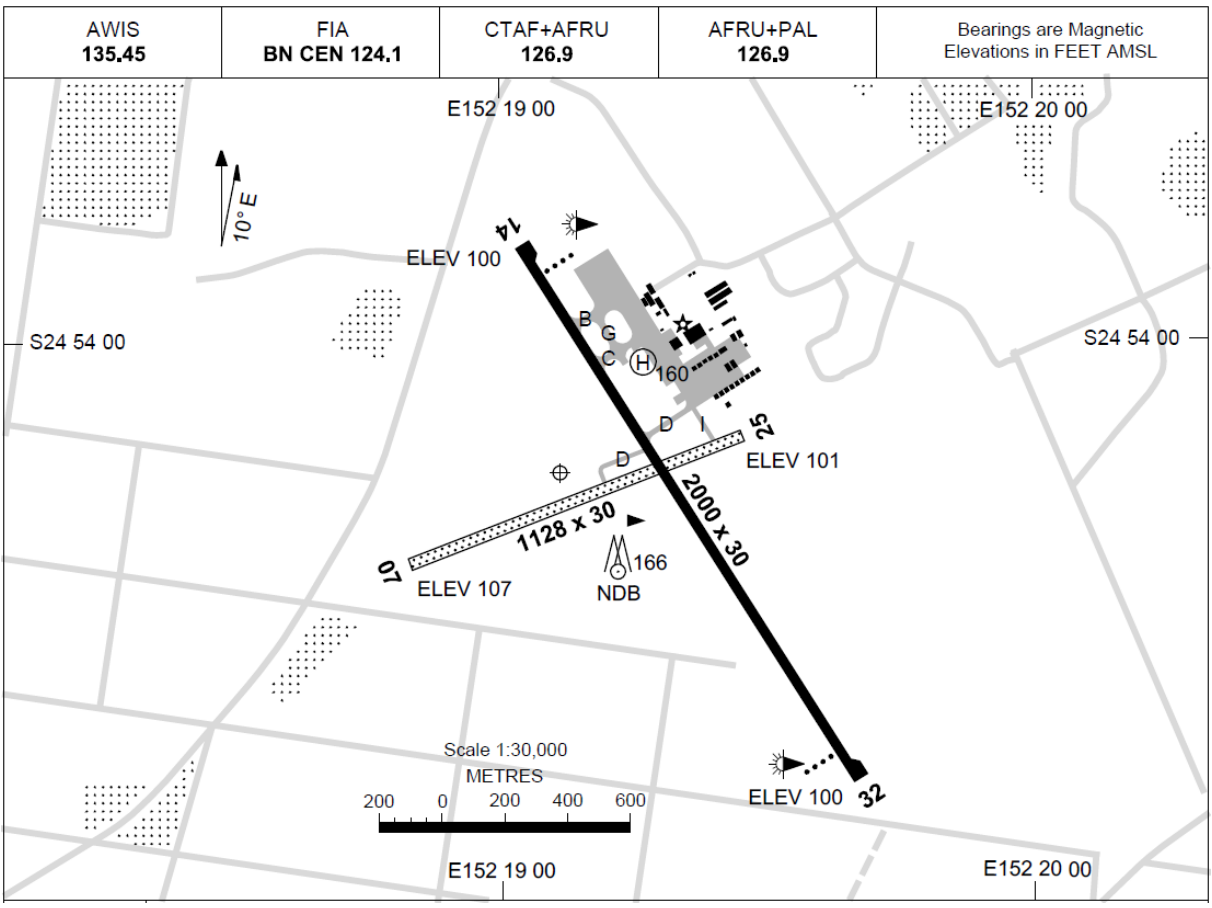


Figure 1: Bundaberg Aerodrome Chart. Source: Departure and Approach Procedures. Airservices Australia. Effective Date: 16 Aug 2018.

3.2.3 Regular Public Transport (RPT) services are provided to Bundaberg by QantasLink and Alliance Airlines. The airport is also serviced by charter aircraft and is used by aeromedical services. General Aviation (GA) activity is supported by the longstanding Bundaberg Aero Club (established 1935) as well as the presence of the Jabiru Aircraft factory.

## 3.3 Surrounding Aerodromes

3.3.1 No other aerodromes are present within 20 NM of Bundaberg (scope of this review) however, it is noted that Monduran, Childers and Pacific Haven Airports all fall just outside of this distance (between 21 and 23 NM). The Bundaberg Gliding Club operates from Elliot Field (Aircraft Landing Area (ALA)) which is located within D691.

## 3.4 Details of Bundaberg airspace

3.4.1 All airspace as defined in the scope is designated Class G airspace, with Class E airspace above commencing from 8,500 ft.

3.4.2 Other airspace surrounding Bundaberg includes Danger Area (D691) to the south (Active from the surface – 5,000 ft AMSL) and Restricted Area (R693) (Active from NOTAM – NOTAM) the east over water. D691 exists for flying training and also encompasses airspace used by the Bundaberg Aero Modellers. R693 exists for Military Flying and is controlled by Fleet Headquarters Potts Point.

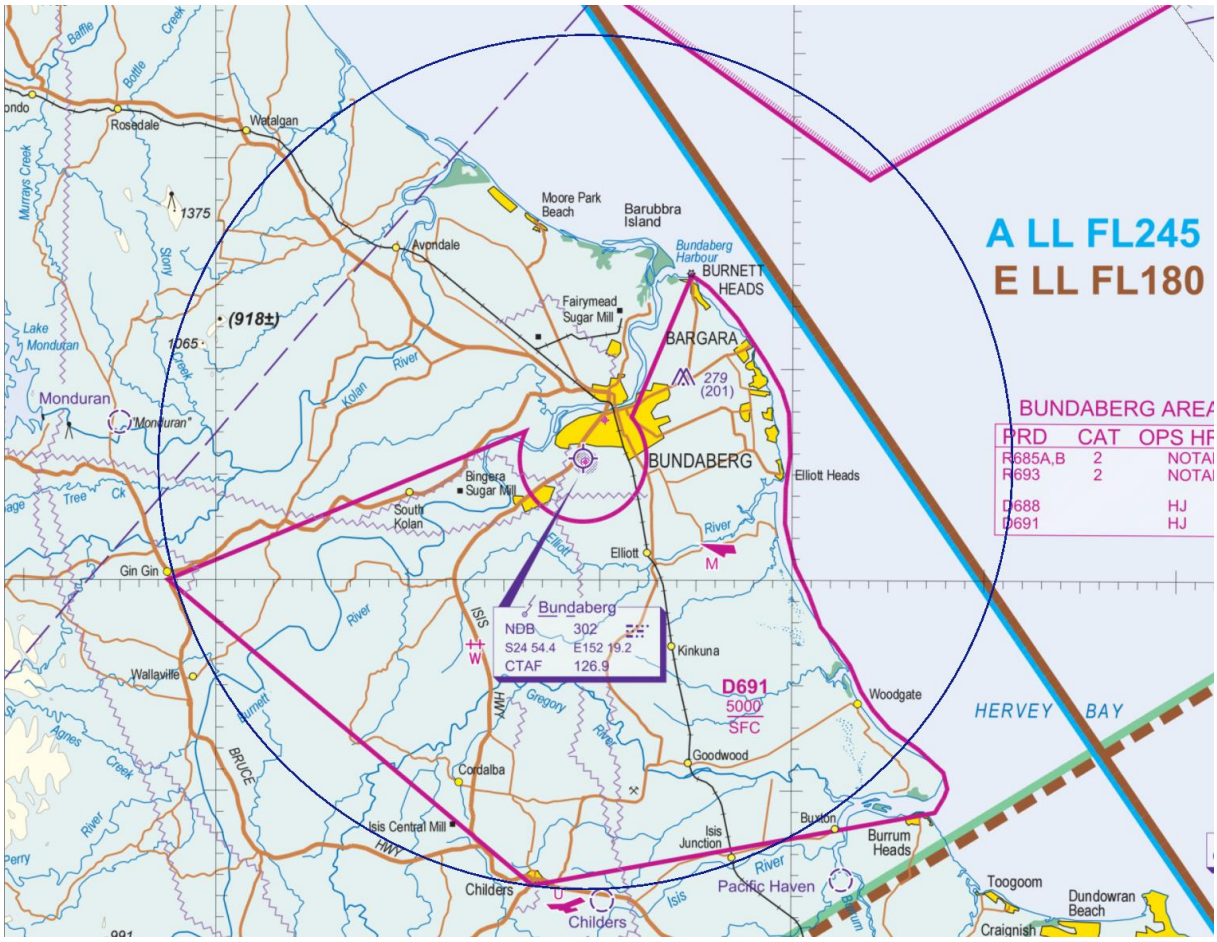


Figure 2: Extract of Bundaberg Visual Navigation Chart with 20 NM ring (blue). Source: Airservices Australia. Effective date 24 May 2018.

3.4.3 Monduran, Childers and Pacific Haven aerodromes are outside of D691. Ultralight aircraft activity is conducted in the vicinity of Childers Aerodrome.

## 3.5 Air Navigation Service Providers in the Bundaberg area

3.5.1 The airspace surrounding Bundaberg is non-controlled, with Class E overhead from 8,500 ft AMSL up to FL180, at which point it becomes Class A airspace. This Class E airspace stretches from the Northern edge of the Brisbane CTA to the Southern edge of the Rockhampton CTA.

3.5.2 Airservices provides radar (Radio Detection and Ranging) control services from the Brisbane Air Traffic Services Centre for the Class E and Class A airspace over Bundaberg through the Burnett Sector. Airservices provides a Flight Information Service to all IFR aircraft operating in Class G airspace across Australia.

3.5.3 An examination of the Instrument Flight Procedures (IFP) into Bundaberg was also undertaken with the aim of identifying any potential issues. Bundaberg has both Non-Directional Beacon (NDB) and Area Navigation (RNAV) approaches to RWYs 14 and 32. Additionally Bundaberg has Global Navigation Satellite System (GNSS) approaches for both runways. Due to Bundaberg being a non-controlled aerodrome and the IFPs commencing in non-controlled airspace, there is no requirement to consider IFP airspace containment.

## 3.6 Aviation Operations

3.6.1 Bundaberg facilitates an array of operations including RPT services and variety of GA activities including, flight training, charter and aero-medical services.

## 3.7 Movements

3.7.1 Over the period of the study (2009 – 2017), the number of air transport movements remained very stable, in the vicinity of 10,000 per year. Conversely, total aircraft movements at Bundaberg have fluctuated, peaking in 2012 and steadily declining from 2015. There is no apparent cause for this.

3.7.2 Over the same period, passenger movement numbers increased, exceeding 200,000 in 2016 (203,087). Given the growth in passengers combined with the steady number of Air Transport movements, it can be deduced that flights are being filled more frequently with passengers.

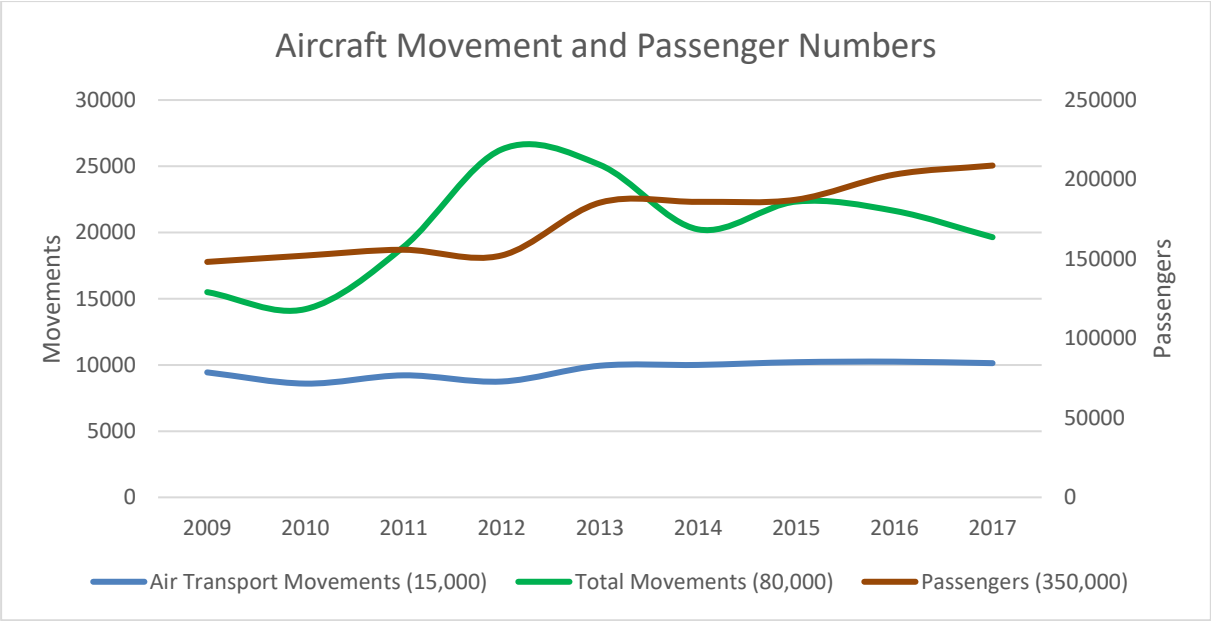


Figure 3: Bundaberg aircraft movements and passengers 2009-2017. The Trigger numbers to conduct a review are contained in the legend. Source: ATSB and Airservices Australia.

3.7.4 The Australian Airspace Policy Statement 2018 (AAPS) identifies trigger criteria with respect to total aircraft movements, passenger transport movements and passenger numbers for an airport. When these criteria are met, CASA should undertake a review ensuring the airspace remains fit for purpose. This trigger criteria are set at 350,000 passengers, 80,000 total movements and 15,000 air transport movements. Generally, only one of these criteria will be met to conduct a review. It is clear from Figure 3 that Bundaberg's numbers fall short against all of these criteria.

3.7.5 As part of the Bundaberg Master Plan, Bundaberg Airport identified three possible passenger growth scenarios for the airport. These included a low, central and high growth scenario. The main quantitative influences identified which affect passenger growth include Queensland's Gross State Product (GSP) as well as the price of fares.[3] The Master Plan offers no position on which scenario is most likely to eventuate.

3.7.6 Based purely on the historical data illustrated in Figure 3, it is suggested that the 'High Growth Scenario' identified in the Master Plan is the most likely to eventuate. This is due to this scenario most closely resembling the actual passenger movement numbers for 2015-2017 shown in Figure 3. It must be emphasised that this assumption is based on historical data only and would likely be altered with change in key factors such as QLD GSP, tourism numbers or critical infrastructure changes.

3.7.7 The 'High Growth Scenario' suggests that passenger numbers will grow steadily and begin to approach 350,000 passengers by 2032. The Master Plan forecasts a lower rate of growth in aircraft movements than compared with passengers. This would indicate that the primary area of movement growth is focused around large passenger transport aircraft. Based on this Master Plan, no major changes to the nature of operations in the airspace around Bundaberg are anticipated.

[3] http://www.bundaberg.qld.gov.au/files/Bundaberg_Airport_Master_Plan_May_2016_combined.pdf

# 4 AVIATION SAFETY OCCURRENCES

## 4.1 Aviation Safety Incident Reports

4.1.1 Any accident or incident involving Australian registered aircraft or foreign registered aircraft in Australian airspace must be reported to the Australian Transport Safety Bureau (ATSB). Every Aviation Safety Incident Report (ASIR) is entered into the ATSB database and is available to the OAR. Information from the ATSB confidential reporting system (REPCON) is also available.

4.1.2 To accurately and consistently organise and describe all occurrences, the ATSB utilises the Safety Investigation Information Management System (SIIMS) taxonomy. This system utilises a hierarchy of three levels of descriptors against each occurrence. These descriptors provide a benchmark against which comparisons of occurrences can be made, as well as allowing efficient and accurate analysis of occurrences.

4.1.3 Records indicate that there were 9 unique airspace-related occurrences within 20 NM of Bundaberg from 01 January 2009 to 31 December 2017. All airspace-related occurrences related to aircraft separation. The table below illustrates the number of airspace occurrences per year.

| **Airspace Occurrence Type** | **Year** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| AIRCRAFT SEPARATION | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 3 |
| **Total Aircraft Movements** | 15497 | 14213 | 18910 | 26272 | 25106 | 20235 | 22335 | 21633 | 19641 |

Table 1: Airspace occurrences at Bundaberg 01 January 2009 - 31 December 2017.

4.1.4 Table 1 shows that the numbers of airspace related occurrences are very low and no distinct trend is apparent. All occurrences were classified as Incidents. The ATSB's summary of each airspace occurrence is detailed below:

- *Incident (2009):* During the flare for a touch and go landing, the Jabiru crew noticed an aircraft on short final for the opposite runway. The crew made a full stop landing and exited the runway.
- *Incident (2010).* As the Hawker 850 joined the circuit, the crew received a Traffic Collision Avoidance System (TCAS) Resolution Advisory (RA) on an aircraft which was already on downwind. The pilot of the other aircraft had not responded to any of the Hawker 850 crew's inbound calls.
- *Incident (2012).* During approach, the Hawker Beechcraft B200 pilot observed another aircraft crossing beneath them. No radio broadcasts had been received from the other aircraft. The pilot of the other aircraft subsequently reported that their radio volume had been turned down.
- *Incident (2014).* During the approach to runway 32, the crew of the Avions ATR-72 was in communication with an aircraft and self-separating. While established on a 5NM final, the crew of the ATR-72 observed the aircraft in a position different to what was reported.
- *Incident (2016).* During approach, the crew of the DHC-8 observed a Piper PA-28 climbing on a reciprocal track. The crew of the DHC-8 received a TCAS-TA (Traffic Alert) alert and commenced a missed approach to maintain separation.
- *Incident (2016).* A Bombardier DHC-8 aircraft, operating scheduled passenger flight from Brisbane, commenced descent to Bundaberg. At about the same time, a Eurocopter MBB-BK 117 helicopter, was being prepared to depart Bundaberg. The flight crew of the DHC-8 made the required broadcasts while on approach to Bundaberg and received no responses from other potentially conflicting aircraft. While the DHC-8 was on final approach, the helicopter departed on a potentially conflicting flight path to the DHC-8. The flight crew of the DHC-8 received a TA on the helicopter and was able to visually sight the helicopter. By this time the helicopter had

commenced a turn to their destination and the projected flight paths of the aircraft were now clear.

- *Incident (2017).* During climb, the crew of the Bombardier DHC-8 received a TCAS TA on the Pilatus PC-12 on a converging track. ATC instructed the PC-12 to manoeuvre to maintain separation.

- *Incident (2017).* During approach, the crew of the Bombardier DHC-8 received a TCAS TA on a departing aircraft. The crew of both aircraft established radio contact and sighted each other. The crew of the DHC-8 did not hear any broadcasts on the CTAF from the other aircraft prior to its departure.

- *Incident (2017).* While backtracking for departure, the crew of the Bombardier DHC-8 observed an aircraft joining the circuit for the same runway. The DHC-8 crew expedited the backtrack and departed ahead of the inbound aircraft. No radio calls were heard from the inbound aircraft.

### 4.2 Aircraft Involved

4.2.1 Out of a total of 9 separate airspace related occurrences, a total of 18 individual aircraft from a variety of operating sectors were involved. These included:

- ATR 72
- Beechcraft King Air 200
- 4 x Bombardier Dash 8
- Hawker 850
- Jabiru
- 2 x MBB/Kawasaki BK 117
- Piper PA-28
- Pilatus PC-12
- 6 x Unknown aircraft

4.2.2 CASA has developed a sector mapping system which aims to consistently identify and group different operational sectors of the aviation industry. Aircraft involved in the occurrences came from several sectors including small and large aeroplane air transport operations, Remotely Piloted Aircraft (RPA), helicopter and self-administered organisations. No sector was disproportionately represented among the occurrences.

### 4.3 ASIR Summary

4.3.1 Although these occurrences were coded as airspace-related by the ATSB, it is clear from their summaries that the airspace environment and design itself did not contribute to these occurrences. This conclusion is based on the fact the majority of the incidents related to communications and compliance with non-controlled aerodrome procedures. Due to this, no justification for airspace change based on these occurrences exists.

## 5 DETAILED FEEDBACK FROM STAKEHOLDERS

5.0.1 A number of stakeholders involved in operations at Bundaberg were contacted and invited to provide feedback in relation the airspace. Stakeholders that invited to provide feedback are listed in Annex C. Comments provided by stakeholders are detailed in Annex D.

## 6 KEY ISSUES AND FINDING

- Issue: GA aircraft will occasionally make taxi calls from an area which is shielded from aircraft on approach to runway 32.
- Finding: This can result in airborne aircraft not being aware of the intentions of those on the ground. In some instances, this has resulted in aircraft positioning to conduct operations on the opposite runway to that which inbound aircraft are intending to land.

- Recommendation: OAR will request CASA's Aviation Safety Advisors include awareness training regarding radio shielding from terrain and buildings as part of their safety seminars.

# ANNEX A – ACRONYMS AND ABBREVIATIONS

| Acronym / Abbreviation | Explanation |
|---|---|
| AAPS | Australian Airspace Policy Statement 2018 |
| Act | *Airspace Act 2007* |
| AFRU | Aerodrome Frequency Response Unit |
| ALA | Aircraft Landing Area |
| AMSL | Above Mean Sea Level |
| ARFF | Aerodrome Rescue and Fire Fighting |
| ASIR | Aviation Safety Incident Report |
| ATS | Air Traffic Service |
| ATSB | Australian Transport Safety Bureau |
| CASA | Civil Aviation Safety Authority |
| CTA | controlled airspace |
| CTAF | Common Traffic Advisory Frequency |
| ft | feet |
| GSP | Gross State Product |
| IAS | Indicated Air Speed |
| ICAO | International Civil Aviation Organization |
| IFP | Instrument Flight Procedures |
| IFR | Instrument Flight Rules |
| NM | Nautical Miles |
| OAR | Office of Airspace Regulation |
| radar | Radio Detection and Ranging |
| REPCON | Confidential Reporting Scheme |
| RA | Resolution Advisory |
| RPA | remotely piloted aircraft |
| RNAV | Area Navigation |
| RWY | Runway |
| SVFR | Special Visual Flight Rules |
| TA | Traffic Advisory |
| TCAS | Traffic Collision Avoidance System |
| VFR | Visual Flight Rules |
| VMC | Visual Meteorological Conditions |

# ANNEX B – AUSTRALIAN AIRSPACE STRUCTURE

| Class | Description | Summary of Services/Procedures/Rules |
|---|---|---|
| **Class A** | All airspace above Flight Level (FL) 180 (east coast) or FL 245 | Instrument Flight Rules (IFR) only. All aircraft require a clearance from Air Traffic Control (ATC) and are separated by ATC. Continuous two-way radio and transponder required. No speed limitation. |
| **Class B** | Not currently used in Australia. | |
| **Class C** | In control zones (CTRs) of defined dimensions and control area steps generally associated with controlled aerodromes | All aircraft require a clearance from ATC to enter airspace. All aircraft require continuous two-way radio and transponder. IFR separated from IFR, VFR and Special VFR (SVFR) by ATC with no speed limitation for IFR operations. VFR receives traffic information on other VFR but is not separated from each other by ATC. SVFR are separated from SVFR when visibility is less than visual meteorological conditions (VMC). VFR and SVFR speed limited to 250 knots (KT) indicated air speed (IAS) below 10,000 feet (ft) Above Mean Sea Level (AMSL)*. |
| **Class D** | Towered locations such as Bankstown, Parafield, Archerfield, Parafield and Alice Springs. | All aircraft require a clearance from ATC to enter airspace. For VFR flights this may be in an abbreviated form. As in Class C airspace all aircraft are separated on take-off and landing. All aircraft require continuous two-way radio and are speed limited to 200 knots IAS at or below 2,500 ft within 4 NM of the primary Class D aerodrome and 250 knots IAS in the remaining Class D airspace**.IFR are separated from IFR, SVFR, and are provided with traffic information on all VFR. VFR receives traffic on all other aircraft but are not separated by ATC. SVFR are separated from SVFR when VIS is less than VMC. |
| **Class E** | Controlled airspace not covered in classifications above | All aircraft require continuous two-way radio and transponder. All aircraft are speed limited to 250 knots IAS below 10,000 ft AMSL*, IFR require a clearance from ATC to enter airspace and are separated from IFR by ATC, and provided with traffic information as far as practicable on VFR. VFR does not require a clearance from ATC to enter airspace and are provided with a Flight Information Service (FIS). On request and ATC workload permitting, a Surveillance Information Service (SIS) is available within surveillance coverage. |
| **Class F** | Not currently used in Australia. | |
| **Class G** | Non-controlled | Clearance from ATC to enter airspace not required. All aircraft are speed limited to 250 knots IAS below 10,000 ft AMSL*. IFR require continuous two-way radio and receive a FIS, including traffic information on other IFR. VFR receive a FIS. On request and ATC workload permitting, a SIS is available within surveillance coverage. VHF radio required above 5,000 ft AMSL and at aerodromes where carriage and use of radio is required. |

* Not applicable to military aircraft.
**If traffic conditions permit, ATC may approve a pilot's request to exceed the 200 kt speed limit to a maximum limit of 250 kt unless the pilot informs ATC a higher minimum speed is required.

# ANNEX C – STAKEHOLDER LIST

| | Organisation |
|---|---|
| | Airservices Australia |
| | Alliance Airlines |
| | Bundaberg Aero Club |
| | Bundaberg Regional Council |
| | Crom Air Charter |
| | Jabiru Aircraft Factory |
| | QantasLink |
| | Recreational Aviation Australia |
| | Royal Flying Doctor Service |

# ANNEX D – STAKEHOLDER FEEDBACK

Airport Operations:

While it is noted that there is a large amount of light G/A aircraft that operate within the area (particularly on the finer days) however, they generally communicate well, and we are able to operate without any major concerns. It has been noted though that there is some shielding occurring for aircraft on the ground, as outlined below:

*"Occasionally, an aircraft will make their taxi call from an area (behind a hanger) that is shielded from our aircraft on final approach to runway 32. In this situation we require them to make an additional taxi call once clear of this shielded region.*

*We have had the occasional Jabiru line up runway 14 with QantasLink on finals runway 32 (tailwind landing). This is the first time we have been aware of a Jabiru taxiing."*

*Aside from this, as I have mentioned, we generally have no concerns within the area.*

Response:

CASA acknowledges the issues of environmental shielding and the effect this can have on aircraft on the ground at aerodromes. The OAR will request that CASA's ASAs include awareness information regarding this issue in their regular safety presentations.