



OPERATIONAL RISK REVIEW

BOONAH AIRFIELD

Prepared for Scenic Rim Regional Council

DOCUMENT CONTROL

Document Title: Boonah Airfield Operational Risk Review

Reference: YBOA01-01

Release Date: 30 January 2017

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Reviewed by: K Tonkin

Released by: K Tonkin

Revision History: Release

| <i>Version</i> | <i>Description</i> | <i>Transmitted</i> | <i>Reviewed by</i> | <i>Date</i> |
|----------------|--------------------|--------------------|--------------------|-----------------|
| 0.1 | First Draft | 29 September 2015 | | |
| 0.2 | Second Draft | 02 October 2015 | SRRC | 07 October 2015 |
| 0.3 | Final Draft | 12 October 2015 | SRRC | 30 January 2017 |
| 1.0 | Final for Release | 30 January 2017 | | |

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GLOSSARY

| | |
|-------|-------------------------------------|
| ALA | aeroplane landing area |
| ALARP | as low as reasonably practicable |
| AMSL | above mean sea level |
| BAI | Boonah Aviation Incorporated |
| BGC | Boonah Gliding Club |
| BSPS | Boonah Shire Planning Scheme 2006 |
| CAAP | Civil Aviation Advisory Publication |
| CASA | Civil Aviation Safety Authority |
| CASR | Civil Aviation Safety Regulations |
| ERSA | En Route Supplement Australia |
| GFA | Gliding Federation of Australia |
| GNI | Gliding Now Incorporated |
| LGA | local government area |
| OLS | obstacle limitation surface |
| SRRRC | Scenic Rim Regional Council |
| WDI | wind direction indicator |

EXECUTIVE SUMMARY

Introduction

Boonah Airfield is a community asset owned by Scenic Rim Regional Council (SRRC) on the southern outskirts of Boonah. In April 2010 SRRC agreed enter into a 15 year lease with Boonah Aviation Inc. (BAI) for the management of this facility and to develop subleases with owners of the four hangars which are located on the property.

A perceived increase in the scope and intensity of aircraft operations at the airfield has led to a decision by SRRC to engage an external consultant, Aviation Projects, to investigate and report on the risks that arise from aircraft operations at the airfield, and determine whether or not these risks are being satisfactorily managed.

External Context

The following external context was considered in this review:

- Civil Aviation Safety Authority;
- Gliding Federation of Australia;
- Scenic Rim Regional Council; and
- Boonah Shire Planning Scheme.

Internal Context

The following internal context was considered in this review:

- Current management arrangements;
- Stakeholder and community safety;
- Facility and insurance risk;
- Community expectations; and
- Potential future directions of the facility.

Conclusions

High level risks have been identified and assessed in relation to each function at the aerodrome:

1. Current management arrangements;
2. Stakeholder and community safety;
3. Facility and insurance risk;

4. Planning and regulatory requirements;
5. Community expectations; and
6. Potential future directions of the facility.

Current management arrangements

A safety culture in need of improvement results from the combination of ambiguity surrounding the extent of BAI's power in access control, undefined aerodrome boundaries, difficulty in obtaining consistent operational information, little formality in safety reporting and follow-up actions, and ineffective inter-club working relationships.

Stakeholder and community safety

The need for improved aerodrome facilities and procedures results from latent conditions associated with the WDIs, the runway hump, fencing, the use of radios by all users and existing access control measures.

Facility and insurance risk

There is a need to address uncertainties that exist in the Boonah Airfield insurance and areas of legal obligations of incorporated associations at Boonah Airfield that may not have been met.

Planning and regulatory requirements

There is a need for increased involvement of SRRC in the safeguarding and strategic planning for Boonah Airfield and to ensure incorporated associations involved in the operation of Boonah Airfield that legal obligations are satisfied.

Community expectations

There is potential for improvement in the approach taken by SRRC and Boonah Airfield users (including BAI) to engagement with the surrounding community.

Potential future directions of the facility

There is a need to establish milestones in the short term prior to committing to further action, as well as increasing the degree of SRRC involvement in Boonah Airfield's operational and strategic planning. A change in existing management arrangements is likely to be required to manage aerodrome operations effectively.

Summary

Risk treatments have been identified for each of the areas of activity, which, if effectively implemented, will result in an acceptable level of risk.

Recommendations

As a result of the foregoing risk assessment, the risk treatments listed below are recommended for implementation.

Current management arrangements

- 1.1. Define the aerodrome site and hence the aerodrome boundaries.
- 1.2. Establish Local Law(s) to address the matters related to Boonah Airfield administration of management.
- 1.3. Review and resolve the BAI lease arrangement with SRRC to ensure no ambiguity surrounds the extent to which aerodrome management powers apply.
- 1.4. Review existing operational information documentation to ensure adequacy and consistency of information and publish the appropriate information in ERSA and on the aerodrome management (BAI) website.
- 1.5. Formalise processes for occurrence reporting and follow-up actions to ensure adequate of details are recorded, appropriate authorities are promptly notified and relevant safety lessons are educated to all users.
- 1.6. Review the appropriateness of the BAI By Laws clause limiting the number of gliding clubs to one at Boonah Airfield.

Stakeholder and community safety

- 2.1. Either one of the following:
 - 2.1.1. Publish an operational caution in ERSA and aerodrome operator's website regarding contrary WDI readings, requiring confirmation of runways in use prior to runway usage; or
 - 2.1.2. Remove runway end WDIs and only use one WDI for referencing wind direction in determining the runway direction for landing.
- 2.2. Reduce the pronounced hump in the runway by approximately 800 mm to improve line of sight for pilots.
- 2.3. Establish a requirement that all aircraft using the aerodrome must carry and appropriately use a two way radio.
- 2.4. Install a fence and appropriate signage to discourage unauthorised access from Degen Road.
- 2.5. Explore fencing options, which would achieve acceptable animal hazard control as well as adequate frangibility to minimise aircraft damage if a collision occurs.
- 2.6. Install signage in airport property advising rules and penalties associated with unauthorised access, inappropriate handling of domestic animals and inappropriate behaviour on aerodrome property.
- 2.7. Define the OLS, carry out an aeronautical obstacle survey, ensure the OLS is not penetrated by any obstacles and publish the data.

Facility and insurance risk

- 3.1. Define the Boonah Airfield property boundary.
- 3.2. Encourage neighbouring land owners making part of their property available for aviation uses to consider public liability risk.
- 3.3. As an incorporated association, ensure BAI satisfies its legal obligations regarding public liability.

Planning and regulatory requirements

- 4.1. Properly define the aerodrome site so that it is reflected in local planning schemes, SRRC Local Laws By Laws, and BAI By Laws. Ensure security exists with respect to any land to be occupied by the aerodrome that is owned by another entity.
- 4.2. Establish an OLS to protect the operational airspace of Boonah Airfield.
- 4.3. Review the compatibility of land use plans and the planning scheme code regarding Boonah Airfield.
- 4.4. Increase SRRC involvement and support in the development of a funding strategy, which may include providing support in applying for grants or providing funds directly in support of Boonah Airfield operations.
- 4.5. Engage with aircraft operators and aerodrome management organisation(s) to establish a requirement to comply with directions or instructions given and to enforce compliance.
- 4.6. Engage with local operators at Boonah Airfield in support of their obligations as incorporated associations.

Community expectations

- 5.1. Review all published information (in ERSA and in other distributed documentation) to ensure clarity in procedures and consistency between documents.
- 5.2. Publish illustrations of the flight paths, noise sensitive areas to avoid overflying on SRRC's and/or the aerodrome operator's website. Reference this publication in ERSA.

Potential future directions of the facility

- 6.1. Formalise / confirm a preferred future direction for Boonah Airfield, in consideration of the following provisions:
 - 6.1.1. Implement treatments for unacceptable safety risks in the short term; and
 - 6.1.2. No intensification of use until all identified risk treatments are implemented.
- 6.2. Increase operational and managerial engagement with BAI, including attending committee meetings.
- 6.3. Work with BAI in support of developing funding strategies.

Triggers for review

Triggers for review of this risk assessment are provided for consideration and implementation as appropriate:

1. following any significant change to the scope of operations at the aerodrome;
2. following any near miss, incident or accident associated with operations considered in this risk assessment;
3. On revision of the applicable planning scheme;
4. On significant change of management arrangements; and
5. At the time of renewing the lease.

1. INTRODUCTION

1.1. Situation

Boonah Airfield is a community asset owned by Scenic Rim Regional Council (SRRC) on the southern outskirts of Boonah. In April 2010 SRRC agreed enter into a 15 year lease with Boonah Aviation Inc. (BAI) for the management of this facility and to develop subleases with owners of the four hangars which are located on the property.

A perceived increase in the scope and intensity of aircraft operations at the airfield has led to a decision by SRRC to engage an external consultant, Aviation Projects, to investigate and report on the risks that arise from aircraft operations at the airfield, and determine whether or not these risks are being satisfactorily managed.

1.2. Scope of Work

The scope of work for this task is as follows:

- An analysis of Council risk in airfield operations in the following areas:
 - Stakeholder and community safety;
 - Facility and insurance risk;
 - Planning and regulatory requirements;
 - Community expectations, including noise levels and hours of operation;
 - A review of current management arrangements; and
 - A review of potential future directions of the facility.

1.3. Approach to task

In conducting this review the following activities were undertaken:

- The scope of work and project program were confirmed at a meeting with client representatives;
- An inspection of operations at Boonah Airfield was carried out on 16 August 2015 to establish a baseline for analysis of the nominated risks;
- Client material and applicable documentation, regulatory requirements, lease documents, management oversight arrangements and the strategic context was reviewed;
- Airfield stakeholders were consulted as agreed by SRRC;
- A first draft report was prepared for client review and feedback;
- A number of meetings/workshop with SRRC internal stakeholders were held and draft conclusions and recommendations were considered;
- A Final Draft Report for presentation to SRRC Councillors was prepared; and

- A final report for Client acceptance was submitted.

1.4. Report Structure

The report is structured under the following headings:

- Introduction;
- External Context;
- Internal Context;
- Potential future directions of the facility;
- Consultation;
- Risk criteria;
- Risk identification;
- Analysis, evaluation and treatment;
- Conclusions; and
- Recommendations.

1.5. Stakeholders

The following stakeholders were consulted and/or considered in the preparation of this plan:

- Aircraft operators and other tenants and aerodrome users;
- Boonah Airfield neighbouring property tenants;
- Boonah Aviation Incorporated;
- Gliding Federation of Australia;
- Gliding Now Incorporated;
- Members of the public; and
- Scenic Rim Regional Council.

1.6. Client material

The following client material was received/consulted in the preparation of this review:

- Boonah Aviation incorporated, *BAI By Laws at 31st May 2015*;
- Boonah Aviation Incorporated, Boonah Airfield Schematic, dated May 2015;
- Boonah Aviation Incorporated, Constitution and Rules, dated 15 April 2010;

- Email from Gliding Federation of Australia to Gliding Now, subject: *New Club – Gliding Now*, dated 16 May 2014;
- Email from Gliding Now to The President – Boonah Aviation Inc, Subject: *Gliding Now*, dated 17 May 2014;
- Emails sent between Boonah Aviation Incorporated, Gliding Federation of Australia and Scenic Rim Regional Council Gliding between 26 May 2014 and 8 April 2015;
- Gliding Now, *Safety Management System*, dated 20 April 2014;
- Lease/Sub Lease, Form 7 v6, Lessor: Scenic Rim Regional Council, Lessee: Boonah Aviation Incorporated, commencement 1 July 2010, expiry 29 September 2020;
- Letter from Gliding Federation of Australia to Scenic Rim Regional Council, subject: *Gliding Operations at Boonah Airfield*, dated 13 November 2014;
- Meeting minutes from meetings undertaken in August 2006 to February 2007;
- Rehbein AOS Airport Consulting, Boonah Airfield Development Plan for Boonah Shire Council, dated March 2006; and
- Scenic Rim Regional Council, *Boonah Airfield - 2015-16 Certificate of Currency*, dated 30 June 2015.

1.7. References

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

- Aeronautical Information Package; including AIP Book effective 20 August 2015 and En Route Supplement Australia dated effective 20 August 2015;
- CASA, Civil Aviation Safety Regulations (CASR) 1998, Part 139—*Aerodromes*;
- CASA, Manual of Standards Part 139—*Aerodromes*, Version 1.12: November 2014;
- CASA, Civil Aviation Advisory Publication (CAAP) 92-1(1) *Guidelines for Aeroplane Landing Areas*, July 1992;
- Gliding Federation of Australia, *Gliding Federation of Australia: Operations Manual*, dated August 2013;
- International Civil Aviation Organization, Doc 9856 *Safety Management Manual*, Third Edition 2013;
- Standards Australia, AS/NZS ISO 31000:2009 Risk Management - Principles and guidelines; and
- other references as noted.

2. EXTERNAL CONTEXT

2.1. Civil Aviation Safety Authority and Gliding Federation of Australia

The Civil Aviation Safety Authority (CASA) regulates aviation activities in Australia. CASA delegates regulatory oversight of sport and recreational aviation operations to CASA approved organisations. Gliding Federation of Australia (GFA) is responsible for the regulatory oversight of gliding operations in Australia.

GFA has approved the operation of the gliding clubs, Boonah Gliding Club (BGC) and Gliding Now (GN), at Boonah Airfield.

GFA provided a summary of incidents reported by BGC for the period 01 January 2011 to 31 December 2015 (noting that the report was provided on 07 October 2015).

2.2. Scenic Rim Regional Council

SRRC is the owner of Boonah Airfield and has leased two land parcels of the aerodrome to BAI.

SRRC has structured its Local Laws in line with the Model Local Laws issued by the State Government. Local Law No. 4 (Local Government Controlled Areas, Facilities and Roads) 2011 enables Council to regulate the use of local government controlled areas, facilities and roads by Subordinate Local Law. However SRRC has not adopted a Subordinate Local Law in respect of Boonah Airfield.

Boonah Shire Council (now SRRC) commissioned Rehbein AOS Airport Consulting to investigate and make recommendations on the development potential of Boonah Airfield so that specific Planning Scheme Overlays could be derived to ensure compatible uses in its vicinity. A report was prepared and submitted to Boonah Shire Council in March 2006.

The report provided six options that were most likely available to Council. A meeting was conducted by Boonah Shire Council on 25 July 2006. With respect to the acceptance of these options, the minutes of the meeting states the following:

Moved Cr Webster, seconded Cr Smith: ...2. That Council adopt and implement Development Option 1 and those parts of Development Option 2 providing for widening of the airfield and reduction of the existing hump in the runway, subject to negotiation with the committee representing airfield users of appropriate arrangements for delivery of those works at no net cost to Council.

The nominated options are copied below:

6.1 OPTION 1 - IMPLEMENT LOW COST MEASURES TO IMPROVE SAFETY

This option does not expand airfield facilities or actively encourage growth but seeks to improve the current situation with a view to:

- *making facilities and operations safer; and*
- *gaining income from the facility.*

6.2 OPTION 2 - ENCOURAGE SOME GROWTH (LIMITED LAND ACQUISITION)

This option does support expansion of airfield facilities and encourage some growth in runway capacity which in turn may increase the number of aircraft owners seeking to base their aircraft at Boonah. Because of the limited nature of the proposed land acquisition, this option does not cater for additional hangarage, a factor which will continue to limit growth. ...

The recommended actions, summarised minutes of subsequent meetings with respect to the recommended actions and the current status of the recommended actions are provided in Table 1.

Table 1 Recommended actions, subsequent actions and current status

| <i>Option</i> | <i>Recommended action</i> | <i>17 Aug 06</i> | <i>25 Aug 06</i> | <i>27 Sep 06</i> | <i>29 Sep 06</i> | <i>27 Oct 06</i> | <i>24 Nov 06</i> | <i>23 Feb 07</i> | <i>Current status</i> |
|---------------|---|---|--|------------------|------------------|------------------|------------------|------------------|--------------------------|
| 1(a) | Install signage on Depot Road warning road users of aircraft flying low over the road. | Underway. Locate old signs or Council to provide signs. | Underway. Signs not located. Council to provide signs. | Underway. | Underway. | Underway. | Not mentioned. | Underway. | Not addressed. No signs. |
| 1(b) | Improve the general condition of the runway surface particularly in the vicinity of the hump in the runway by tyning the strip and/or top dressing annually. | Deferred. Hump levelling was planned. | Deferred. | Deferred. | Deferred. | Not mentioned. | Not mentioned. | Not mentioned. | Not addressed. |
| 1(c) | Clearly mark the extent of the runway and/or runway strip available for take-off at each end as well as taxiway access to the hangars and the aircraft parking areas. | Underway. | Underway. | Underway. | Underway. | Underway. | Not mentioned. | Not mentioned. | Partially complete. |

AVIATION PROJECTS

| Option | Recommended action | 17 Aug 06 | 25 Aug 06 | 27 Sep 06 | 29 Sep 06 | 27 Oct 06 | 24 Nov 06 | 23 Feb 07 | Current status |
|--------|---|-----------|-----------|--|-----------|----------------|----------------|----------------------------------|--|
| 1(d) | Provide and utilise an appropriately located windsock and signal circle, removable glider sign and unserviceability cross. This may require Council to acquire the use of additional land. | Underway. | Underway. | Required land area was identified at site inspection on 1/9/06. Users have agreed to supply & install the required structures. | Underway. | Not mentioned. | Not mentioned. | Not mentioned. | Unaddressed (partially completed). No signal circle near primary wind direction indicator. |
| 1(e) | Replace the fence along Depot Road to create a visual barrier to reinforce the "No Unauthorised entry" sign. Lock the Grace Street entry. Formalise access arrangements for aircraft hangared on private property | Underway. | Underway. | Underway. | Underway. | Not mentioned. | Not mentioned. | Deferred. Users prefer no fence. | Not addressed. No fence. No signs. |

AVIATION PROJECTS

| <i>Option</i> | <i>Recommended action</i> | <i>17 Aug 06</i> | <i>25 Aug 06</i> | <i>27 Sep 06</i> | <i>29 Sep 06</i> | <i>27 Oct 06</i> | <i>24 Nov 06</i> | <i>23 Feb 07</i> | <i>Current status</i> |
|---------------|--|--|------------------|------------------|------------------|------------------------------|--------------------------------------|----------------------------|-----------------------|
| 1(f) | Make arrangements for vehicle parking off the airfield site. | Deferred. Future of Council's allotment in Harm St to be determined. | Deferred. | Deferred. | Deferred. | Not mentioned. | Not mentioned. | Not mentioned. | Not addressed. |
| 1(g) | Oversight user arrangements to implement new CASA operational requirements and issue NOTAM to facilitate local arrangements if required to ensure safe operations. | Underway. | Underway. | Underway. | Underway. | Underway. | Not mentioned. | Not mentioned. | Inconclusive. |
| 1(h) | Establish a regular maintenance program in consultation with users and set up arrangements with users to report ad hoc urgent maintenance requirements. | Underway. | Underway. | Underway. | Underway. | Users mowed 20 October 2006. | Mower purchase discussions underway. | Underway. Quotes received. | Addressed. |

AVIATION PROJECTS

| <i>Option</i> | <i>Recommended action</i> | <i>17 Aug 06</i> | <i>25 Aug 06</i> | <i>27 Sep 06</i> | <i>29 Sep 06</i> | <i>27 Oct 06</i> | <i>24 Nov 06</i> | <i>23 Feb 07</i> | <i>Current status</i> |
|---------------|---|------------------|--|------------------|------------------|------------------|------------------|------------------------|--|
| 1(i) | Develop a fact sheet which can be posted on the Council website or faxed or emailed to visiting pilots. | Deferred. | Deferred. | Deferred. | Deferred. | Not mentioned. | Not mentioned. | Not mentioned. | Partially addressed. Improvement required in document control and publishing arrangements. |
| 1(j) | Require organisers of “special events” at the airfield to satisfy Council that participants have appropriate insurance and that the event will be safely managed. | Deferred. | Deferred. | Deferred. | Deferred. | Not mentioned. | Not mentioned. | Dates mentioned. | Addressed. Mentioned in the BAI By Laws and in SRRC’s Aero Thistle Underwriting Services Major Airport Liability Insurance Policy. |
| 1(k) | Enact a local law that allows Council to require land owners whose trees infringe the airfield’s airspace to lop or remove them. | Underway. | Underway. Noted the issue should be taken directly to Council. | No action. | No action. | Not mentioned. | Not mentioned. | Law research underway. | Not addressed. |

AVIATION PROJECTS

| <i>Option</i> | <i>Recommended action</i> | <i>17 Aug 06</i> | <i>25 Aug 06</i> | <i>27 Sep 06</i> | <i>29 Sep 06</i> | <i>27 Oct 06</i> | <i>24 Nov 06</i> | <i>23 Feb 07</i> | <i>Current status</i> |
|---------------|--|------------------|------------------|------------------|------------------|------------------|------------------|---------------------------------|-----------------------|
| 1(l) | Incorporate the new airspace protection drawing into the town planning scheme to prevent new developments infringing the airfield's airspace. | Underway. | Underway. | Underway. | Underway. | Not mentioned. | Not mentioned. | Referred to Council's Planners | Not addressed. |
| 1(m) | Incorporate aircraft noise contours for land use planning purposes in the town planning scheme to prevent incompatible development and establish where development approvals need to incorporate noise mitigation features in buildings. | Underway. | Underway. | Underway. | Underway. | Not mentioned. | Not mentioned. | Referred to Council's Planners. | Not addressed. |

AVIATION PROJECTS

| <i>Option</i> | <i>Recommended action</i> | <i>17 Aug 06</i> | <i>25 Aug 06</i> | <i>27 Sep 06</i> | <i>29 Sep 06</i> | <i>27 Oct 06</i> | <i>24 Nov 06</i> | <i>23 Feb 07</i> | <i>Current status</i> |
|---------------|--|------------------|----------------------------|---|------------------|------------------|------------------|--|-----------------------|
| 1(n) | Establish long term leases for tenants on a commercial basis. | Underway. | Underway. Drafts prepared. | Underway. Council drafts distributed. Lessees obtaining legal advice. | Underway. | Not mentioned. | Underway. | Draft leases were distributed to lessees on 30 August 2006. Lessees have held various discussions with Council and are seeking legal advice prior to formally advising of their acceptance or proposed amendments. | Not addressed. |
| 1(o) | Impose and collect an aircraft access fee and levy from users to cover the cost of the agreed maintenance program. | Deferred. | Underway. | Deferred. | Deferred. | Not mentioned. | Underway. | Accounts issued 11 December 2006. | Addressed. |

AVIATION PROJECTS

| Option | Recommended action | 17 Aug 06 | 25 Aug 06 | 27 Sep 06 | 29 Sep 06 | 27 Oct 06 | 24 Nov 06 | 23 Feb 07 | Current status |
|--------|---|-----------|-----------|-----------|-----------|----------------|-----------|---|----------------------|
| 2(a) | Acquire land from neighbouring landowners to allow establishment of a glider recovery lane, a parallel field taxiway for use by fixed wing aircraft and a short emergency cross runway. | Underway. | Underway. | Underway. | Underway. | Not mentioned. | Underway. | Council has entered into agreements with David Mutton and Mike Maddocks to purchase 20 m wide areas fronting the airfield for a taxiway. Development Applications for these widenings have been approved. Proposals to undertake further widening have been deferred due to cost. | Partially addressed. |

AVIATION PROJECTS

| <i>Option</i> | <i>Recommended action</i> | <i>17 Aug 06</i> | <i>25 Aug 06</i> | <i>27 Sep 06</i> | <i>29 Sep 06</i> | <i>27 Oct 06</i> | <i>24 Nov 06</i> | <i>23 Feb 07</i> | <i>Current status</i> |
|---------------|--|------------------|------------------|------------------|------------------|------------------|------------------|---|-----------------------|
| 2(b) | Reduce the pronounced hump in the runway by approximately 800mm as part of the reconstruction to improve the line of sight and thus encourage use of the full length of the runway to ease congestion on the ground at the southern end. | Not mentioned. | Not mentioned. | Underway. | Underway. | Not mentioned. | Not mentioned. | Deferred due to cost. The committee anticipates that the new taxiway will alleviate the need for these works. | Not addressed. |

2.3. Boonah Shire Planning Scheme

The operative planning scheme is the Boonah Shire Planning Scheme 2006 (BSPS). The BSPS was originally adopted by the former Boonah Shire Council on 28 March 2006 and came into effect on 31 March 2006. The current version of the Boonah Shire Planning Scheme came into effect on and from 20 December 2013.

Part 1 of the Planning Scheme describes its purpose, which is copied below:

In accordance with the Integrated Planning Act 1997 (IPA), Boonah Shire Council has prepared this planning scheme as a framework for managing development in a way that advances the Act's purpose by:

- (a) Identifying assessable and self assessable development; and*
- (b) Identifying outcomes sought to be achieved in Boonah Shire as the context for assessing development.*

Part 3 of the BSPS describes the desired environmental outcomes. The outcomes are copied below:

3.1 Desired Environmental Outcomes

Desired Environmental Outcomes (DEOs) are the basis for the measures of the planning scheme. The 21 DEOs are based on the concept of 'ecological sustainability' established by the Integrated Planning Act 1997 and have been broken down into the following components:

- a) Community well being;*
- b) Economic development; and*
- c) Ecological resources, processes and values.*

Each DEO is sought to be achieved to the extent practicable, having regard to each of the other DEOs. To understand how the planning scheme achieves the DEOs, supporting material is provided in Schedule 2. This material also includes background and contextual material on the DEOs as they relate to the Shire.

In sub-part 3.1 (B), Boonah Airfield has been identified as a significant asset to protect for the purposes of the region's economic development. An extract of this section is copied below:

14) Infrastructure such as:

- ...*
- the Amberley RAAF Base and the **Boonah airstrip**:*

is protected from land uses that would adversely affect the current and future efficiency and operational safety or amenity (for transport corridors) of this infrastructure.

Some residents of the residential development to the north of the aerodrome expressed concern about noise impacts associated with aircraft operations at Boonah Airfield, which could be interpreted as a conflict with the abovementioned BSPS clause.

The obstacle limitation surfaces (OLS) of Boonah Airfield were protected under the former Boonah Shire Planning Scheme 1990 but overlooked in the Boonah Shire Planning Scheme 2006

It has been noted that there are tall trees situated approximately 25 m to the right of the edge of runway 22, which would penetrate the recommended transitional surface as defined in CAAP 92-1(1).

As part of the BSPS land zoning data is provided for the Boonah area, which identifies the Boonah Airfield operational area as a number of different 'precincts'. As seen in Figure 1, the runway area and the south western end of the runway encompassing aviation club houses and some hangars are identified as 'Community Use Precinct' zones. The rest of the land portions occupied by the airfield are identified as 'Industry Precinct' zones.

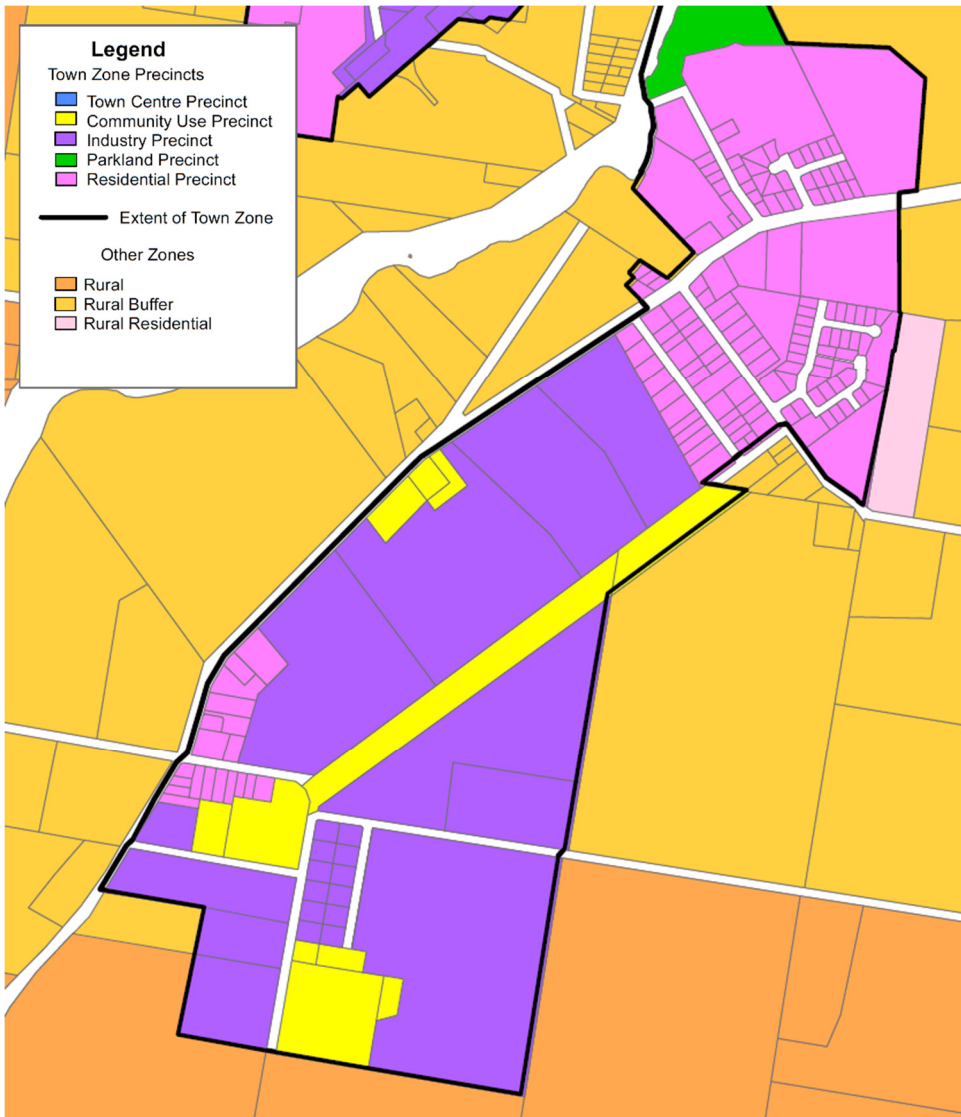


Figure 1 Zoning Map 3: Boonah Town Precincts

3. INTERNAL CONTEXT

3.1. Location

Boonah Airfield is located approximately 23 nm south of RAAF Base Amberley, 45 nm south west of Brisbane Airport and 45 nm west northwest of Gold Coast Airport. A locality map of Boonah Airfield is provided at Figure 2 (source: Google Earth, Qld Globe). It is located outside of controlled airspace.

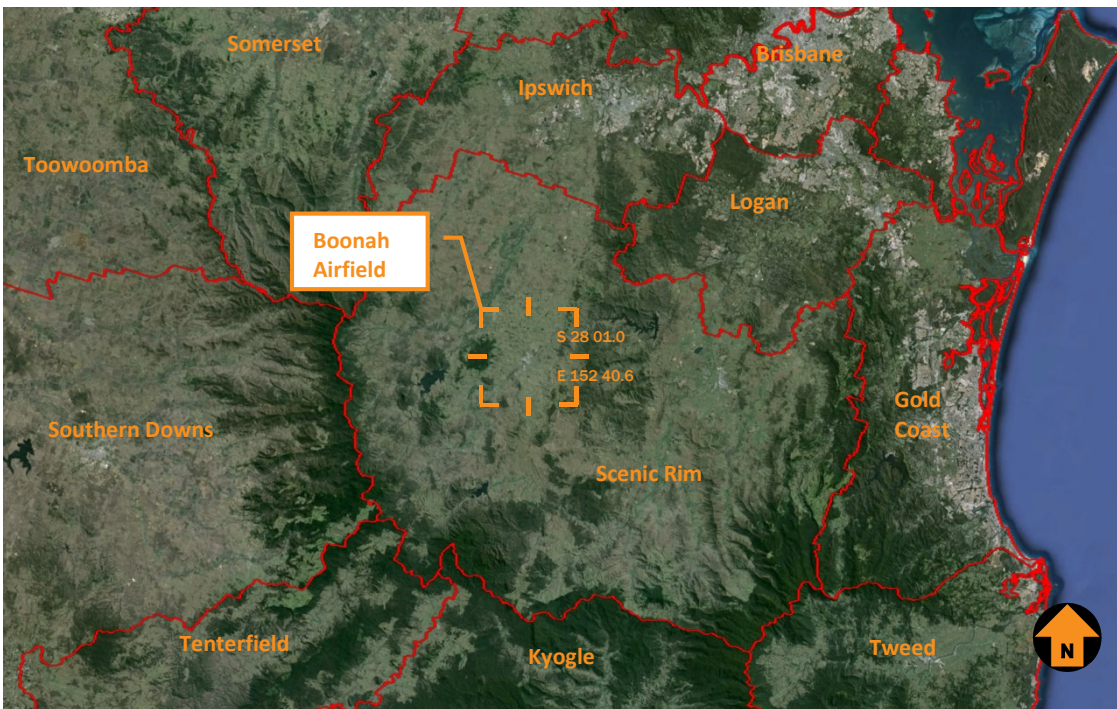


Figure 2 Local government area map

The aerodrome is located 1.2 nm (2.3 km) to the south of the Boonah Township, as shown in the locality map provided at Figure 3 (source: Google Earth). There are residential houses located immediately to the northeast and industrial buildings on the southwestern side of the aerodrome.

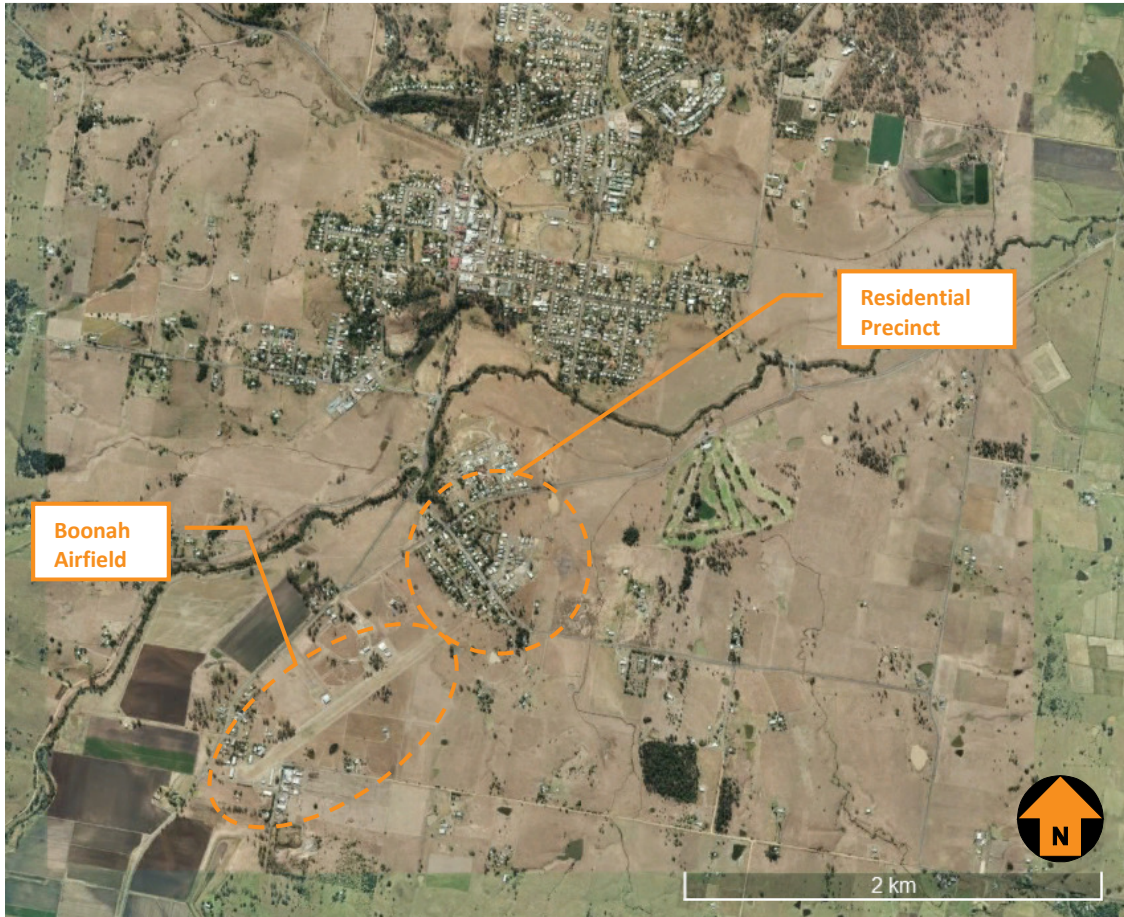


Figure 3 Boonah Airfield locality map

3.2. Current management arrangements

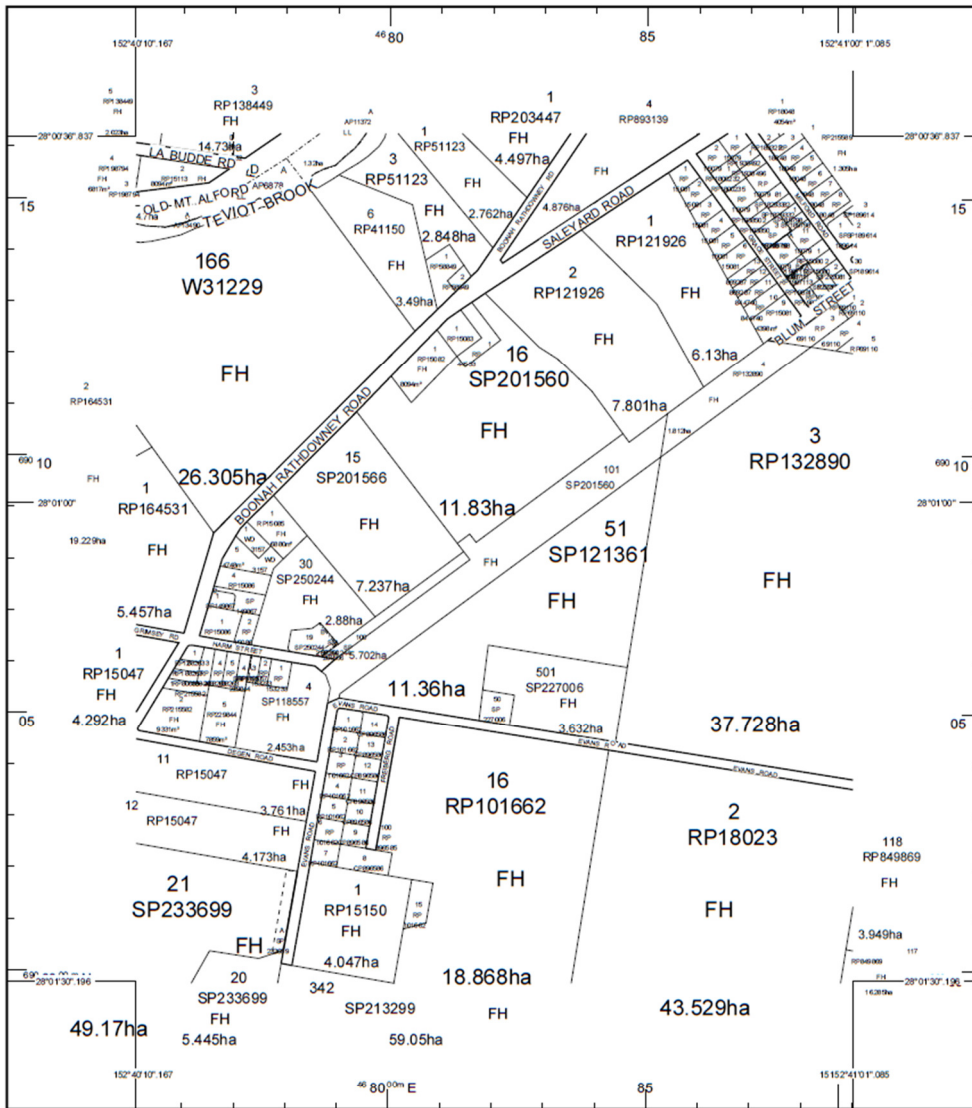
3.2.1. Access management

BAI manages the Boonah Airfield and has leases for two land parcels from SRRC: 4/SP118557 and 5/RP229844, which are located on the southwest side of the runway. The remaining land parcels that comprise the operational areas of Boonah Airfield are owned/leased by SRRC or other entities. A committee, on which a position is reserved for an SRRC member, is required to manage the sites leased by BAI. Anecdotally, the SRRC member does not actively participate in the BAI committee. BAI has indicated that input and cooperation from the local Council is essential for a productive working relationship.

A land parcel map overlaid with a Google Earth satellite image of Boonah Airfield is provided at Figure 4 and a land parcel map with lot information is provided at Figure 5 (source: Google Earth, Qld Globe).



Figure 4 Boonah Airfield land parcel map



STANDARD MAP NUMBER
9441-4142

HORIZONTAL DATUM: GDA94 ZONE: 56 SCALE: 1:1000

MAP WINDOW POSITION & NEAREST LOCATION



| SUBJECT PARCEL DESCRIPTION | |
|----------------------------|---------------------|
| DCDB Lot/Plan | 101/SP201560 |
| Area/Volume | 5.702ha |
| Tenure | FREEHOLD |
| Local Government | SCENIC RIM REGIONAL |
| Locality | DUGANDAN |
| Parish | COOCHIN |
| County | WARD |
| Segment/Parcel | 15080446 |

| CLIENT SERVICE STANDARDS | |
|---|------------|
| PRINTED (dd/mm/yyyy) | 21/09/2015 |
| DCDB | 19/09/2015 |
| Users of the information recorded in this document (the Information) accept all responsibility and risk associated with the use of the Information and should seek independent professional advice in relation to dealings with property. | |
| Despite Department of Natural Resources and Mines (DNRM)'s best efforts, DNRM makes no representations or warranties in relation to the Information, and, to the extent permitted by law, exclude or limit all warranties relating to correctness, accuracy, reliability, completeness or currency and all liability for any direct, indirect and consequential costs, losses, damages and expenses incurred in any way (including but not limited to that arising from negligence) in connection with any use of or reliance on the Information. | |
| For further information on SmartMap products visit http://www.qld.gov.au/property/mapping/smartmap | |

SmartMap

An External Product of SmartMap Information Services
Based upon an extraction from the Digital Cadastral Data Base



Queensland Government
(c) The State of Queensland, (Department of Natural Resources and Mines) 2015.

Figure 5 Boonah Airfield land parcel description

As these figures show, the land occupied by Boonah Airfield is made up of several land parcels, a large portion of which are owned by different entities. The land parcels occupied by the airfield are tabulated in Table 2. The Owner/Lessee details have not been verified against Titles Office data.

Table 2 Land parcel descriptions

| <i>Land Parcel</i> | <i>Area (ha)</i> | <i>Owner</i> | <i>Lessee</i> | <i>Description</i> |
|--|------------------|-----------------------------------|------------------------------|--|
| 2/RP121926 | 7.801 | James Bartholomew | - | A 27m x 180m strip adjacent to the runway is used for glider launch & recovery |
| 16/SP201560 | 11.83 | Michael Maddocks | Gliding Now** | Private hangars |
| 15/SP201566 | 7.24 | Legin Investments P/L | Ultimate Aerobatics** | Private hangars, some aircraft wings overhang this land when taxiing |
| 30/SP250244 | 2.88 | Boonah Aero Space Enterprises P/L | - | Some aircraft wings overhang this land when taxiing |
| 4/RP132890 | 1.812 | SRRRC | BAI* | Northern end of runway |
| 101/SP201560 | 5.70 | SRRRC | BAI* | Central section of runway |
| 100/SP201566 | 0.667 | SRRRC | BAI* | Taxiway |
| Lease area D on SP191416 (Part 4/SP118557) | 0.657 | SRRRC | Boonah Gliding Club Inc.* | Hangar and clubhouse |
| Lease area C on SP191416 (Part 4/SP118557) | 0.152 | SRRRC | The Flying Tigers Club Inc.* | Hangar and clubhouse |
| Balance 4/SP118557 | 1.64 (of 2.45) | SRRRC | BAI* | Southern end of runway and aprons |
| Lease area A on SP191416 (Part 5/RP229844) | 0.104 | SRRRC | Black Eagle Aviation P/L* | Hangar and flying school |
| Lease area B on SP191416 (Part 5/RP229844) | 0.100 | SRRRC | Mark Hamilton* | Hangar |
| Balance 5/RP229844 | 0.556 (of 0.760) | SRRRC | BAI* | Southern runway apron |
| 2/RP215582 | 0.93 | Mark Hamilton | - | Private hangars and aircraft maintenance |
| 3/SP118557 | 0.10 | SRRRC | - | Parking of vehicles |
| Road at end of Harm Street | Not defined | State land | - | Aircraft parking, taxiway |

* These lease agreements are issued for the period 30 September 2010 to 29 September 2020 with 5 year renewal option. Due to an administrative error, not all lots are listed on the lease agreement with BAI.

** Copies of these lease agreements have not been sighted.

The former Boonah Shire Council rearranged boundaries to create 3/SP118557 for sale as a residential lot with frontage to Harm Street. However the proposed sale was deferred pending resolution of drainage issues in this area. The land is shown on the Zoning Map on Page 14 as part of the Residential Precinct but is currently used for vehicle parking by airfield patrons.

An area of road at end of Harm Street has been fenced into the airfield and is available for use as part of the taxi-way and for parking of aircraft. No attempt has been made to permanently close that road area due to the obvious costs of survey, purchase from the State and removal of underground services.

Due to an administrative error, the land parcels occupied by the Boonah Airfield runway are not incorporated in the BAI lease, which consequently limits the powers of BAI's By Laws to only part of the aerodrome area. There are no SRRC Local Laws that address access control at the aerodrome. Additionally, the glider preparation and staging area when runway 22 is in use is the area that is owned by a neighbouring land owner and the continued use of this area is only possible because of the owner's 'goodwill'. As a result of the abovementioned factors, uncertainty surrounding the rights of access from neighbours and operations will continue without establishing appropriate use of the applicable land parcels and rights of access.

3.2.2. Operational management

SRRC has no Local Law that addresses matters related to Boonah Airfield; however, BAI prepared By Laws, the powers of which are intended to apply to its leased sites. There are currently 42 BAI By Laws, which are additional to regulations associated with holding a CASA flight crew license, or current pilot approvals issued by a controlling national body, the limitations expressed in ERSA and those required by the law. The By Laws do not relieve members from the responsibility of complying with any operational regulation implicit in their license or pilot authorisation. These By Laws are enforced by applying a penalty for breach of the laws, which may include a fine of up to \$500 and suspension of user privileges.

The provisions of the By Laws relate to the following matters:

- Aircraft – By Laws 1 to 10;
- Boonah operators – By Laws 11 to 20;
- Motor vehicles and pedestrians – By Laws 21 to 29;
- Animals – By Laws 30 to 31;
- [General matters] – By Laws 32 to 38;
- Local operating procedures – Boonah Airfield – By Law 39;
- Airfield access for adjoining land with business or hangarage operations – By Law 40;
- Aircraft and pilot access fees – By Law 41; and

- Joint aircraft ownership – By Law 42.

The budget for BAI to manage the aerodrome is approximately \$20 000 per year, all of which is used on aerodrome maintenance activities including mowing. By Law 40 (1) requires persons to pay an annual access fee of \$200 for every aircraft hangered or stored on or within land adjoining the aerodrome. Additionally, By Law 40 (3) requires businesses operating at Boonah Airfield to pay an annual maintenance fee of \$500.

The BAI By Laws do not define the boundary of the Boonah Airfield property. No By Laws exist that regulate the remaining land parcels occupied by Boonah Airfield except for any local laws of SRRC where the land parcel is not owned by a private entity.

Local traffic regulations and noise abatement procedures are implemented and published in the En Route Supplement Australia (ERSA) facilities (FAC) page for Boonah Airfield as well as in the BAI By Laws. The content of information published in ERSA is less than the relevant information provided in the By Laws. According to BAI By Law 3, *'Fly in visitors are welcome and if parking for less than seven days, do not require approval'*. There is potential for aircraft operators to be unaware of important operational restrictions/requirements as the BAI By Laws are not published in the public domain.

A copy of the ERSA page is provided at Figure 6 (source: Airservices Australia).

BOONAH **ELEV 330**

FULL NOTAM SERVICE NOT AVBL

| | | |
|--|------------|--------------|
| QLD | UTC +10 | YBOA |
| S 28 01.0 | E 152 40.6 | VAR 11 DEG E |
| AD OPR Boonah Aviation Inc, PO Box 385, Boonah, QLD, 4310. PH 0403 319 124 | | UNCR |
| (Mike Sykes). | | |

REMARKS
Landing fee of \$10.00 will apply to all commercial ACFT.

ATS COMMUNICATIONS FACILITIES
FIA BRISBANE CENTRE 119.5 On ground

LOCAL TRAFFIC REGULATIONS

1. Standard HR for ACFT (other than gliders and circuit training) will be first light to last light (Exception: no departures RWY 04 before 0700 Local).
2. Glider HR: 0800 Local to last light.
3. Flight training and circuit flying HR: 0700 Local to last light MON to SAT and 0900 Local to last light on SUN.
4. Visiting ACFT not permitted to do straight-in approaches.
5. Tug and glider combination DEP RWY 04 may turn right.

CTAF 122.75

NOISE ABATEMENT PROCEDURES
Note: Compliance with the following Noise Abatement Procedures does not affect a pilot's responsibility to operate in accordance with Civil Aviation Regulations and procedures.

1. Preferred RWY 22.
2. Visiting ACFT not permitted to do TGL on RWY 04.
3. Sensitive areas to N of RWY 04 and W to be avoided at all times.
4. DEP FM RWY 04 are required to make 90 left turn at 500FT AGL to avoid overflying populated areas.
5. When operating on RWY 04 maintain circuit height to avoid overflying church W of RWY 04.

ADDITIONAL INFORMATION

1. Gliding and recreational ACFT OPS.
2. Winch launching and aero-tow for glider OPS.
3. Warning: Kangaroo hazard exists.
4. Ultralight OPS and training.
5. See map at www.scenicrim.qld.gov.au for noise sensitive areas.

CHARTS RELATED TO THE AERODROME
WAC 3357




Figure 6 Boonah Airfield ERSA-FAC

BAI By Law 39 addresses the local operating procedures for Boonah Airfield, which states the following:

39. Refer to the Local Operating Procedures for the airfield, which form part of the By Laws. Also available in ERSA.

An extract of the referred Local Operating Procedures in the BAI By Laws is provided at Figure 7. Note that local traffic regulations addressing use of radios and the runway crest in the BAI By Laws are not included in the ERSA.

LOCAL TRAFFIC REGULATIONS

1. Standard hours for aircraft (other than gliders and circuit training) will be first light to last light. Exception: no departures Runway 04 before 0700 local
2. Glider hours: 0800 local to last light
3. Flight Training and circuit flying hours: 0700 to last light Monday to Saturday and 0900 local to last light on Sunday
4. Visiting aircraft not permitted to do straight in approaches
5. Tug and glider combination departing 04 may turn right
6. Due to runway crest aircraft must broadcast intentions on the CTAF before operating on the runway
7. Subject to traffic or operational constraints the following are the preferred departure arrival constraints:
Departures – Preferred RWY 22 due to noise abatement
Arrivals – Preferred RWY 04 due to noise abatement
8. Visiting aircraft not permitted to do TGL on runway 04
9. Backtracking/Taxiing to be on taxiway only except where not operationally possible and the pilot has visually checked that there is no other traffic in the circuit
10. Radio Calls required when backtracking or taxiing
11. When lining up make contact with the tug pilot if uncertain of his intentions (C150-VH-WWP) if gliders are operating
12. All gliding operations must be in conjunction with Boonah Gliding Club

ADDITIONAL INFORMATION

1. Landing fee of \$10.00 will apply to all commercial aircraft
2. Be aware of Gliders for possible unusual circuits and gliding operations
3. Winch launching and aero tow for glider operations
4. Hazards: Kangaroos; birdlife; cattle
5. Gliding operations mainly weekends however ops can be intermittent during the week
6. All aircraft MUST give way to gliders in the circuit
7. Be aware of mowing of airstrip during the week without notice. Crosses may be laid down on the runway south end.
8. Taxiway maximum aircraft wingspan eighteen (18) metre

Charts related to the aerodrome– WAC 3357: ERSA

Figure 7 Extract of Local operating procedures - Boonah Airfield

3.2.3. Reporting management

BAI By Law 10 addresses the arrangement for reporting safety occurrences, which is copied below:

10. Where an accident occurs or is narrowly avoided, every pilot, driver or witness is encouraged to report their experience to the safety officer of their club or to BAI so that procedures or practices can be examined or modified. Safety is the concern of all.

Additionally, BAI By Law 37 addresses the arrangement for handling complaints, which is copied below:

37. Complaints or information regarding incidents, operations or community matters, or recommendations, may be submitted in writing to BAI and will receive the attention of the management committee. Please complete the approved form available from the Secretary

In this material include details of time, place, aircraft or incident, persons concerned, their contact details and all relevant information including the author of the report.

Submit and address these matters through: -

The CFI of any operator or sub-lessee at Boonah Airfield, or

The President, Boonah Aviation Incorporated at: P.O BOX 385 BOONAH QLD 4310

OR VIA EMAIL AT president.boonahaviation@hotmail.com

BAI has indicated that only one noise complaint was made in the last six months, due to the BGC glider tug aircraft undergoing a periodic check flight for maintenance purposes.

A history of safety occurrences at Boonah Airfield was provided by Leo White, on behalf of BAI, in an email dated 6 September 2015. A summary of the safety occurrences at Boonah Airfield is provided in Table 3.

During the period of this review, one near miss occurred between a powered aircraft taking off and a stationary glider on the runway, after which a discussion with the involved individuals was made. Upon enquiry, it would appear that this incident was not reported to GFA or CASA/ATSB by BAI or a Boonah Airfield user. Reporting and follow-up actions to safety occurrences are key elements in achieving an acceptable level of aviation safety. Based on the data that is available, the effectiveness of safety measures with respect to the current reporting arrangements and the follow-up actions that have been taken in response to the occurrences are unclear.

Table 3 Safety occurrences

| <i>No.</i> | <i>Date</i> | <i>Factors</i> | <i>Consequence</i> | <i>Response</i> |
|------------|----------------------|---|--|--|
| 1 | 2015, July or August | <p>Glider in circuit for landing broadcasted intentions to land long on runway 22 to stop near the runway's end.</p> <p>After the glider passed over the threshold of runway 22, the pilot of a powered aircraft, requiring full runway length, broadcasted a lining up call and lined up for take-off on runway 22 and then commenced the take-off roll.</p> <p>Once the powered aircraft cleared the hump, the glider was seen in the middle of the field without its pilot, as it was not able to land long in accordance with previous broadcasted intentions. The line-up broadcast was not heard by the glider pilot.</p> <p>The powered aircraft pilot manoeuvred for collision avoidance.</p> | Nil | Discussions afterwards with persons involved. |
| 2 | 2015, April 25 or 26 | Very low beat up (high risk manoeuvre) | Nil | BAI By Law 37 was activated. |
| 3 | 2015 early | Glider collides with motor vehicle in hangar | Glider written off | Unknown |
| 4 | 2014/15 | Glider collides with fence | Aircraft probably written off, fence was damaged | Pilot received counselling and remedial training |
| 5 | 2000/01 | <p>Self-launching glider and a Cherokee aircraft simultaneously taking off in opposite directions.</p> <p>Pilot in command of glider veered left for collision avoidance, with wing tip overhanging the fence.</p> <p>The Cherokee seen to pass below slight starboard of the glider.</p> | Nil | Unknown |

| No. | Date | Factors | Consequence | Response |
|-----|---------|--|-------------|--|
| 6 | No date | Propeller strike with BGC towplane and Maddocks' dog. The owner sometimes brings the dog on the airfield and can be irate about removing it. | Unknown | BAI By Law 31 applies. |
| 7 | No date | Kangaroo hazard when the aerodrome is not busy. | NA | A radio call to Ultimate Aerobatics on the CTAF can get assistance from a volunteer in a motor vehicle to clear the strip.(Both experienced once by one pilot over one year) |
| 8 | No date | Trees on the southern side of Degen Road were a hazard for runway 04 users checking inbound traffic. | Unknown | The trees were trimmed by BAI in April 2015. |

3.2.4. Engagement with aerodrome users

BAI By Laws outline a requirement for local operators to hold an approval to operate in order to conduct their operations at Boonah Airfield. The By Laws also outline certain criteria to be satisfied in order to be granted the approval. For example, By Law 4, copied below, makes an exception for operators with an authorisation received prior to 1 May 2014:

*4. Excepting existing operators, sub-lessees and their clients, user groups or clubs established on and operating from the airfield with authorisation on the first day of May 2014, any other application for airport use requires an **Approval to Operate** based upon a written application submitted to BAI. Such an application needs to specify the identities and qualifications of all proponents, instructors and intended users, include a proposed operation manual and provide an expert independent risk assessment by a CASA approved person of all facets of the proposed operation in the Boonah airfield environment. This assessment must address all relevant or possible issues such noise, traffic mix, air traffic saturation and safety for all users. The dimensions of the airfield, taxiways, other spaces, controlled airspace, other users and nearby residential, church or commercial properties must be considered in the assessment accompanying any application. This will be made available to all users for comment.*

BAI By Law (36) disallows multiple gliding clubs to be based at Boonah Airfield, which is copied below:

36. No Boonah based gliding operations shall take place at this airfield except through membership of and managed by the Boonah Gliding Club Inc.

GN has been seeking authorisation to operate as a second gliding club at Boonah Airfield (independently of BGC). BAI has indicated that its reasoning for not enabling the approval of GN to operate independently is for safety as the complexity of the operations at Boonah would increase. However, GN has indicated that, as an independent gliding club, there will be little or no effective change in the current aircraft operations.

On 16 May 2014, GFA confirmed that GN successfully passed its operations safety audit and is now operational. GN members currently hold a membership with BGC, which enables GN to operate. GN has satisfied all other legal requirements to operate as a club and has made commitments for achieving a functional working relationship with all other aerodrome operators, including the use of the BGC glider tug aircraft and a minimum account balance with BGC of \$500 for its services.

On 8 April 2015, SRRC sent an email the relevant stakeholders, including GN and BAI representatives, the following email:

Good afternoon Gents

The issues raised by both Gliding Now and Boonah Aviation are matters that Council is seeking further advice. Council accepts there is some ambiguity in relation to responsibilities on the airfield. Matters that have been raised by both groups were recently taken to Council for consideration, with Council reluctant to agree to an additional club until a review is undertaken. Notwithstanding this advice, Council would be hopeful an interim framework could be established by stakeholders that allow gliders to have access to the airfield on reasonable terms.

Face to face stakeholder consultation and a reported safety occurrence indicates inter-club relations and attitudes should improve to be more supportive of an effective safety culture (for example, not adhering to safety related BAI By Laws addressing domestic animal access).

Regardless of the club membership arrangements and assuming all entities have satisfied legal requirements to operate, effective and functional working relationships between all operators at Boonah Airfield are achievable. Working relationships are critical for achieving an effective safety culture and requires commitment from all operators.

3.3. Stakeholder and community safety

3.3.1. Aerodrome facilities

Boonah Airfield is considered an aeroplane landing area (ALA) under the guidance provided in CAAP 92-1(1) *Guidelines for Aeroplane Landing Areas*. The aerodrome is equipped with one main grass runway (04/22) with an elevation of 330 ft above mean sea level (AMSL) and a slope of 2% down to the north.

No obstacle survey information is available for aircraft operator perusal.

Runway distances are labelled in the schematic drawing of Boonah Airfield (see Figure 8). A similar drawing is available on the Boonah Gliding Club website.



Figure 9 Taxiway – facing southwest



Figure 10 Taxiway - facing northeast

There are three wind direction indicators (WDI) at Boonah Airfield, which are shown in Figure 11 and Figure 12. Local aerodrome users have advised that the WDI often give contrary wind direction indications, which has previously led to traffic conflicts on the runway. Aircraft were observed taking off and landing from opposite directions at various times during the site visit on 16 August 2015.



Figure 11 Wind direction indicator - runway 22 threshold



Figure 12 Wind direction indicators - midfield and runway 04 threshold

A hump in the runway exists at Boonah Airfield. The hump has previously resulted in safety occurrences during aircraft take-off and landing operations. Aircraft may become stationary on the runway in an obscured point to pilots' line of sight when lined up on runway 22. Figure 13 and Figure 14 shows a runway hump exists approximately 600 m to 800 m from the runway 22 threshold. When aircraft are lined up for take-off on runway 22, other aircraft (or objects) stationary on the runway beyond the hump can be obscured from the lined up pilot's line of sight (see Table 3 occurrence numbers 1 and 5).



Figure 13 Photo taken in the staging area looking along runway 22

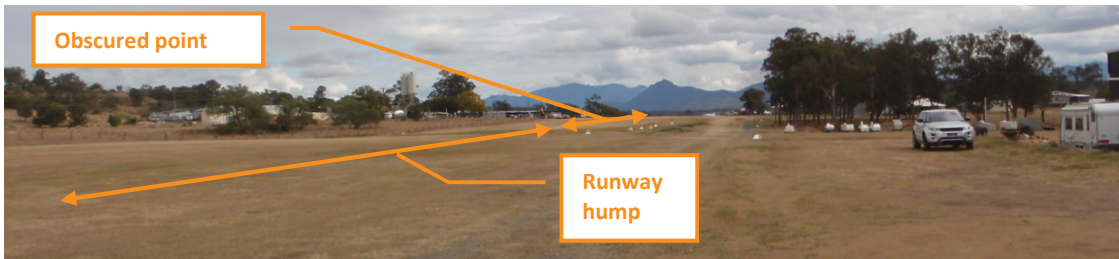


Figure 14 Photo taken on the taxiway approximately 100 m northwest of the Ultimate Aerobatic hangar

The aerodrome is provided with fences at most segments of its perimeter. During the site visit undertaken on 16 August 2015, local users advised the fence along the runway to the left of runway 22 was hit by an aircraft taking off (also see Table 3 occurrence number 4). There is a necessity for access control to address hazards associated with animal stock entering the aerodrome area from neighbouring properties. It is likely that fences remain the appropriate method of access control and appropriate operational training and runway design is required to mitigate risks of fence collisions.

3.3.2. Radio use

Local traffic regulation 6 as stated in the BAI By Laws requires aircraft to broadcast intentions on the CTAF before operating on the runway. However, some aircraft that operate at the aerodrome are not equipped with a suitable radio, which reduces the risk mitigation effectiveness of this regulation. The use of radios is especially important due to the hazards related to the contrary wind direction indications and the runway hump.

3.3.3. Aircraft use

BAI By Laws 1 to 10 address aircraft matters. Commercial, training, group or club operations require prior authorisation from BAI. Itinerants parking their aircraft for less than seven days do not require approval.

An Approval to Operate by BAI requires the user to conduct a risk and impact assessment (prepared by an independent CASA approved person), which is to be attached to the application; and the application to be reviewed in consideration of existing operations at the aerodrome. Approvals are valid for two years.

No aircraft having a wingspan greater than 18 m shall operate at Boonah Airfield unless previously approved.

BAI By Laws 11 to 20 address operators at Boonah Airfield. BAI encourages the reporting of personal experiences of safety accidents, incidences and near misses so that procedures or practices can be reviewed.

BAI requires each operator to submit its own standard operating procedures or practices for approval. A summary of these procedures or practices is made publically available to other users of Boonah Airfield.

The current scope of aircraft operations at Boonah Airfield is summarised in Table 5.

Table 5 Boonah Airfield aviation operations

| <i>Operator</i> | <i>Operation</i> | <i>Aircraft</i> | <i>Frequency</i> |
|------------------------------|------------------|----------------------|------------------------------------|
| BGC (GN) | Recreational | Gliders, powered tug | Daily, mostly weekends |
| Ausport Flying Tigers | RA-Aus, | Fixed wing <5700 kg | Daily, mostly weekends |
| Ultimate Aerobatics | Recreational | Gliders, fixed wing | Daily, mostly weekends |
| Army | Military | Rotary wing | Generally less than once per month |
| QFES | Fire and rescue | Rotary wing | Generally less than once per month |
| Other | Aeromedical | Rotary wing | Generally less than once per month |
| Itinerant | Private, charter | Fixed wing <5700 kg | Daily, mostly weekends |

Examples of the aircraft that operate at Boonah Airfield include gliders for training, aerobatics and race competitions, Cessna 200 series aircraft, scaled replica WW1 and WW2 aircraft, Jabiru aircraft and others. Currently, BGC and GN both operate gliders with wingspans greater than 20 m.

Figure 15 and Figure 16 show powered and glider aircraft in operation at the aerodrome.



Figure 15 Aircraft preparing for take-off - runway 22 threshold



Figure 16 Aerobatic glider landed and stopped on runway 22

3.3.4. Access control

Motor vehicles and pedestrians at the aerodrome is addressed in BAI By Laws 21 to 29. No vehicular access to the aircraft movement areas is permitted unless a reasonable cause exists. Only pedestrians who are members of BAI (and their families), members of sub-lease organisations, operators with lawful airfield access and their clients and persons having lawful reason or excuse may enter upon the airfield at any time. A number of additional conditions must be adhered while accessing Boonah Airfield.

Access control at Boonah Airfield, other than the BAI By Laws, include fences and gates at the aerodrome perimeters. A photo at Figure 17 shows the existing fence to the left of runway 22.



Figure 17 Fence on the left side of runway 22

Figure 18 shows a photo taken on the left side of runway 04 facing northwest, in front of the wind direction indicator near the Ultimate Aerobatics hangar. The fence in the photo is up to 1.7 m high, approximately 50 m from the runway centre line and approximately 27 m from the runway edge. A similar fence structure exists on the opposite side of the runway, although in a relatively degraded condition.



Figure 18 Fence on the left side of runway 04 near the Ultimate Aerobatics hangar

Perhaps due to user preference, segments of the perimeter do not have fences or signs. Consequently, these segments are not serviced by any access control measures. Figure 19 shows a photo taken near the runway 04 threshold facing southwest, approximately at the runway 04 final segment of the circuit where aircraft would approach from the right and land to the left of the photo. The photo shows two motor vehicles using a segment of Degen Road, which is a public road. In the absence of a fence or other form of barrier, there is no effective treatment that would discourage rogue behaviour by people or animals with unauthorised access.



Figure 19 Runway 04 threshold facing southwest

BAI By Laws 30 and 31 address matters associated with domestic and non-domestic animals accessing the aerodrome. These By Laws are copied below:

30. Kangaroos and stray cattle are hazards to aviation on the airfield and their removal is encouraged

31. No domestic animals whatsoever are allowed on the airfield unless restrained and accompanied by a lawful airfield user.

Meeting minutes taken in 2006 and 2007 indicated adjacent land owners' domestic pets and animal stock would transgress onto the aerodrome aircraft movement areas. There were mentions of researching improved fencing methods, for example electrical fencing, in order to address the issue (including discouraging wild animals such as kangaroos from accessing the aerodrome). However, it is unclear if measurable action was taken.

The current practices for mitigating animal hazards are:

- Ad hoc wildlife harassment (kangaroos); and
- The existing fencing has little effect in stopping kangaroos from accessing the aerodrome. Furthermore, the fences are structured such that animals sufficiently small can crawl through the wire.

Previously, a domestic dog owned by a user of the aerodrome was struck by a propeller of a self-launching glider as it was not handled in accordance with the BAI By Laws. It is unknown whether the incident occurred on BAI's leased sites or on another site.

3.4. Facility and insurance risk

3.4.1. Extent of liability

BAI has a lease for two land parcels located at the southwestern extremity of the aerodrome and the BAI By Laws only have power applicable to these land parcels. The remaining land parcels are owned/leased by other entities, including SRRC and private land owners. SRRC is insured for a maximum of \$250 million with associated conditions. The insurance policy does not specify the property boundaries of the aerodrome. However, the insurance does cover the scope of operations at the aerodrome, but the insurer must be notified prior to special events such as exhibitions, air shows and/or air meets.

There is uncertainty with respect to liability where private land is used for Boonah Airfield purposes. For example, if a claim was made on private property, which has been allowed to be used by aerodrome users, the extent of liability is unclear (whether it is the liability of the land owner or SRRC).

3.4.2. Legal obligations

As an incorporated association, BAI is subject to the Associations Incorporation Act 1981 and Associations Incorporation Regulation 1999.

The Incorporated Associations Smart Business Guide, published by Queensland Government, states the following:

- Your management committee is legally required to:

- Review insurance requirements each year and report the results at the annual general meeting;
- Tell members the risks if no public liability insurance is taken out;
- Tell people applying to be members, and nominees for election to the management committee, whether your incorporated association has public liability insurance and how much coverage it has; and
- Tell any person or entity who your incorporated association deals with if it does not have public liability insurance.

BAI submitted that it has not examined the terms of the policy nor received any professional briefing regarding its adequacy.

3.5. Community expectations

3.5.1. Noise abatement

The noise abatement procedures in the ERSA and the BAI By Laws are the following:

- Standard flying times – First light to last light. Exception: no departures on runway 04 before 0700;
- Flight training and circuit flying – Mon to Sat: 0700 to last light. Sun: 0900 to last light;
- Gliders – 0800 to last light;
- Glider and tug combination – Departing 04 may turn right;
- Departure and arrival procedures differ between ERSA and BAI By Laws:
 - BAI By Laws: Departures: preferred runway 22. Arrivals: preferred runway 04; and
 - ERSA: Preferred runway 22;
- Touch and go landings – Not permitted on runway 04 for visiting aircraft;
- Sensitive areas to avoid – north of runway 04 and west (mentioned in ERSA only);
- Departing runway 04 – turn left 90 degrees at 500 ft AGL (mentioned in ERSA only); and
- Circuits runway 04 – maintain circuit height to avoid overflying church west of runway (mentioned in ERSA only).

There are no published illustrations of the flight paths, areas to avoid overflying and other noise abatement considerations.

3.5.2. Complaints handling

BAI has indicated that only one noise complaint was made in the last six months, due to the BGC glider tug aircraft undergoing a periodic check flight for maintenance purposes. It has been indicated by BAI that the community seems to have greater tolerance to noise on weekends, which is when aircraft operations are primarily conducted.

There is no formal methodology to managing complaints. BAI suggested it would welcome a web based input, report or complaint communication system accessible via a link on the SRRC website, but expressed reservations about being able to provide the time and human resources required to manage such a service.

3.6. Potential future directions of the facility

The potential future directions of the facility are outlined in the following sections:

3.6.1. Option 1: Status quo

This option involves not taking any action and so there will be no change.

Advantages are that there will be no need for users and stakeholders to commit to change. Additionally, SRRC remains free of aerodrome operation costs and to have minimal involvement.

Disadvantages are associated with low confidence and certainty among users and stakeholders in the future of Boonah Airfield because of the existing planning scheme and operational risks identified herein. The following factors apply:

- planning scheme mechanisms that are supportive of Boonah Airfield operations remain insufficient;
- continued development incompatible with Boonah Airfield will have an adverse and multidimensional cumulative effect. Examples of dimensions of the effect may be:
 - added constraints because of community expectations (e.g. noise abatement); or
 - more obstacles appearing in close vicinity of the aerodrome;
- the operational risks identified herein, particularly the unacceptable ones, remain untreated. The untreated risks would result in a scenario with the following sequence of events:
 1. the exacerbation of existing hazardous conditions as the operations at the aerodrome intensify,
 2. an increase in frequency of safety occurrences;
 3. the likelihood of a major or catastrophic safety occurrence increases; and
 4. an increasing number of risks becoming unacceptable.

Costs involved with this option are associated with the added constraints that will lead to further complications as well as the untreated risks that will likely lead to a major or catastrophic safety occurrence.

3.6.2. Option 2: Improvement

This option involves the review of the planning scheme so that planning mechanisms are in place that better protect Boonah Airfield operations. Additionally, this option involves the treating of risks identified herein.

Advantages are that there will be greater certainty and confidence among users and stakeholders in Boonah Airfield's future. There will be adequate planning mechanisms in place to support Boonah Airfield operations, including airspace protection and compatible surrounding development. The risks identified, particularly the unacceptable ones, will be treated, reducing likelihoods of adverse outcomes.

Disadvantages are that users and stakeholders will need to commit to change in order to effectively improve operations at Boonah Airfield. In addition, SRRC will require its involvement to be increased with respect to planning, strategy and management of the aerodrome.

The costs associated with this options would be the increase in allocations of resources, including personnel and time.

3.6.3. Option 3: Closure

This option involves the ceasing of Boonah Airfield operations, the land to be used for another purpose and no construction of a replacement aerodrome.

Advantages are that SRRC will not need to allocate resources in supporting the aerodrome operations, with the exception of amending relevant documentation such as the planning scheme. Additionally, the following existing issues will not be a factor:

- incompatible surrounding developments;
- identified risks; and
- uncertainty of the future.

Disadvantages are the following:

- a significant loss will likely be experienced for locally based aviation enthusiasts who frequently use Boonah Airfield;
- aircraft operators/clubs that are significant to their industry are based at Boonah Airfield. Closing the aerodrome will require the locally based operators to either relocate their base to another aerodrome or stop their operations;
- air travel will no longer be an option for visitors of Boonah; and
- emergency and aeromedical aircraft operators will no longer have Boonah Airfield as an option for their operations.

Costs associated with this option would be due to a decrease in visitations to Boonah and associated visitor expenditure losses. The reason for the losses is because there are operators at Boonah Airfield with a large number of members and that have a large number of visitors.

3.6.4. Option 4: Relocation

This option involves Boonah Airfield operations to cease, the land to be used for another purpose and the construction of a replacement aerodrome in the vicinity of Boonah or at least within the local government area (LGA).

Advantages are the following:

- there is the opportunity to select a site optimal for the envisioned aerodrome operations;
- minimal or no loss of visitations to Boonah will be experienced;
- locally based aviation enthusiasts will still have a local aerodrome to support their operations; and

- the following existing issues will not be a factor:
 1. incompatible surrounding developments;
 2. identified risks; and
 3. uncertainty of the future.

Disadvantages are that construction of the aerodrome will have associated costs and that SRRC will require its involvement to be increased with respect to planning, strategy and management of the aerodrome.

Costs associated with this option would be construction associated costs and costs due to increased allocations of resources, including personnel and time.

A summary of the above options is provided in Table 6.

Table 6 Future directions of the facility

| <i>Option</i> | <i>Description</i> | <i>Advantages</i> | <i>Disadvantages</i> | <i>Costs</i> |
|---------------|--------------------|--|---|---|
| 1 | Status quo | No need for users and stakeholders to change. SRRC has minimal involvement and incurs minimal costs. | Low certainty and confidence among users and stakeholders in the future aerodrome operational status. Insufficient planning mechanisms to protect future aerodrome operations. Risks identified herein remain untreated and ultimately exacerbated. | Costs associated with managing the accumulating constraints and additional complications. Costs associated with a major or catastrophic safety occurrence. |
| 2 | Improvement | Greater certainty and confidence among users and stakeholders in the aerodrome's future. Sufficient planning mechanisms to protect future aerodrome operations. Risks identified herein are treated and reduced. | Users and stakeholders require commitment to change. SRRC will require increased involvement with respect to planning, strategy and management of the aerodrome. | Increased allocations of resources, including personnel and time. |

| <i>Option</i> | <i>Description</i> | <i>Advantages</i> | <i>Disadvantages</i> | <i>Costs</i> |
|---------------|--------------------|---|--|--|
| 3 | Closure | <p>The following existing issues will not be a factor:</p> <ul style="list-style-type: none"> • Incompatible surrounding developments; • Identified risks; and • uncertainty of the future. <p>No involvement required by SRRC.</p> | <p>A significant loss for local aviation enthusiasts will be experienced.</p> <p>Large operators based at the aerodrome will stop operations or need to relocate.</p> <p>Air travel will no longer be an option for visitors of Boonah.</p> <p>Emergency and aeromedical aircraft operators will no longer have Boonah Airfield as an option for their operations.</p> | <p>Losses due to reduced visitation expenditure in the Boonah area.</p> |
| 4 | Relocation | <p>The following existing issues will not be a factor:</p> <ul style="list-style-type: none"> • Incompatible surrounding developments; • Identified risks; and • uncertainty of the future. <p>An optimal site can be selected for the new aerodrome.</p> <p>Minimal or no loss of visitations will be experienced.</p> <p>Local aviation enthusiasts will still have a local aerodrome to support their operations.</p> | <p>SRRC will require its involvement to be increased with respect to planning, strategy and management of the aerodrome.</p> | <p>Construction associated costs.</p> <p>Increased allocations of resources, including personnel and time.</p> |

3.7. Potential future management arrangements

Four options for the future management arrangements for the facility are outlined in the following section.

3.7.1. Option 1: Status quo

This option involves taking no action and maintaining current management arrangements.

Advantages are that there will be no need for users and stakeholders to commit to change. Additionally, SRRC remains free of aerodrome operation costs and to have minimal involvement.

Disadvantages are associated with low confidence and certainty among users and stakeholders in the future of Boonah Airfield due to the ambiguity with respect to the extent of BAI's managerial powers and the implications that results from this ambiguity.

Costs associated with this option are associated with time and other resources required in addressing the persisting problems as a result of the status quo.

3.7.2. Option 2: Dissolve BAI and form separate advisory committee

This option is to dissolve BAI and form a separate advisory committee. The advisory committee would consist of members that provide adequate representation of the users and stakeholders of Boonah Airfield. This committee would serve to advise SRRC in the making of Local Laws regarding the matters associated with Boonah Airfield.

The advantages of this option are the following:

- SRRC being the owner of applicable Local Laws will remove doubt regarding the enforceability of the Local Laws; and
- lease arrangements would not be a factor with regard to the application of governing power.

The disadvantage of this option is that the advisory committee would not possess a clear legitimacy of managerial power. The committee would only serve as the link between the aerodrome operations and SRRC as the governing body for the aerodrome.

The costs involved with this option would be due to the allocation of resources in performing managerial activities by SRRC. If any advisory committee members are not volunteers, then costs would also be incurred by their salaries.

3.7.3. Option 3: Dissolve BAI and manage in-house

This option involves dissolving BAI and SRRC managing the aerodrome in-house. The managing staff would consist of SRRC employees who would serve to manage Boonah Airfield operations.

Advantages with this option are the following:

- SRRC being the owner of applicable Local Laws will remove doubt regarding the enforceability of the Local Laws;
- lease arrangements would not be a factor with regard to the application of governing power; and

- a clear legitimacy of managerial power would exist, which would depend on clearly defining the organisational structure and roles and responsibilities applicable to the positions of the organisation.

Disadvantages of this option are that no representation of the aerodrome users and stakeholders would exist. Therefore, SRRC would be required to ensure the interests of aerodrome users and other stakeholders are sufficiently represented when carrying out the managerial responsibilities of an aerodrome operator. Sufficient representation may be achieved through active engagement and consultation with aerodrome users and stakeholders.

Costs involved with this option would be associated with providing required staff members to satisfy the responsibilities as the managers of an aerodrome.

3.7.4. Option 4: Contract external management company

Option 4 is to disband BAI and contract an external management company. A similar arrangement exists for various aerodromes including Dalby, Miles and Chinchilla aerodromes.

Advantages of this option are the following:

- SRRC being the owner of applicable Local Laws will remove doubt regarding the enforceability of the Local Laws;
- lease arrangements would not be a factor with regard to the application of governing power;
- there will be a specialised organisation dedicated to managing the operations of the aerodrome; and
- a clear legitimacy of managerial power would exist, which would depend on clearly defining the organisational structure and roles and responsibilities applicable to the positions of the organisation.

Disadvantages of this option would be the uncertainty of the risks that could be associated with introducing an external organisation to manage the aerodrome.

The costs involved with this option would be associated with resource allocations in the processes for contractor selection and the implementation of the organisation into its position. In addition, there would be operating costs associated with an external contractor.

A summary of the above options is provided in Table 7.

Table 7 Future directions of the facility

| <i>Option</i> | <i>Description</i> | <i>Advantages</i> | <i>Disadvantages</i> | <i>Costs</i> |
|---------------|---|---|---|---|
| 1 | Status quo | There will be no need for users and stakeholders to commit to change. SRRC remains free of aerodrome operation costs and to have minimal involvement. | Low confidence and certainty exist among users and stakeholders in the future of Boonah Airfield due to the ambiguity with respect to the extent of BAI's managerial powers and the implications that results from this ambiguity. | Time and other resources required to be allocated to address the persisting problems. |
| 2 | Dissolve BAI and form separate advisory committee | SRRC being the owner of applicable Local Laws will remove doubt regarding the enforceability of the Local Laws. Lease arrangements would not be a factor with regard to the application of governing power. | The advisory committee would not possess a clear legitimacy of managerial power. The committee would only serve as the link between the aerodrome operations and SRRC as the governing body for the aerodrome. | Allocation of resources in performing managerial activities will be incurred by SRRC. Any non-volunteer committee members would be paid for by SRRC. |
| 3 | Dissolve BAI and manage in-house | SRRC being the owner of applicable Local Laws will remove doubt regarding the enforceability of the Local Laws. lease arrangements would not be a factor with regard to the application of governing power. a clear legitimacy of managerial power would exist, which would depend on clearly defining the organisational structure and roles and responsibilities applicable to the positions of the organisation. | No dedicated representation of the aerodrome users and stakeholders would exist. SRRC would be required to ensure the interests of aerodrome users and other stakeholders are sufficiently represented when carrying out the managerial responsibilities of an aerodrome operator. | Providing required staff members for managing the aerodrome will require allocation of resources. |

| <i>Option</i> | <i>Description</i> | <i>Advantages</i> | <i>Disadvantages</i> | <i>Costs</i> |
|---------------|--------------------------------------|---|---|---|
| 4 | Contract external management company | <p>Doubt regarding the enforceability of the Local Laws will be removed.</p> <p>Lease arrangements would not be a factor with regard to the application of governing power.</p> <p>There will be a specialised organisation dedicated to managing the operations of the aerodrome.</p> <p>A clear legitimacy of managerial power would exist, which would depend on clearly defining the organisational structure and roles and responsibilities applicable to the positions of the organisation.</p> | There is potential for uncertainty to exist regarding the risks that could be associated with introducing an external organisation to manage the aerodrome. | <p>Resource allocations will be incurred by SRRC in the process of selecting a contractor and implementing the organisation into its position.</p> <p>Ongoing operational costs associated with a employing an external contractor.</p> |

4. STAKEHOLDER CONSULTATION

Community feedback on the operation of Boonah Airfield was invited by SRRRC during the consultation period 05-19 August 2015.

Keith Tonkin of Aviation Projects participated in a number of face to face interviews and a site visit on Sunday 16 August 2015.

The following consultation activities were undertaken during the community engagement phase of the engagement:

- SRRRC requested submissions via the 'Have Your Say' website page;
- a telephone conversation was held with one stakeholder;
- face to face interviews were held with some people; and
- A site visit was conducted to observe flying operations and have conversations with local operators.

A summary of findings from the consultation process is provided at Table 8.

Subsequent to the formal consultation period, several conversations were held with various parties, including SRRRC representatives and representatives of Gliding Federation of Australia.

Additional information regarding numbers of aircraft movements and aviation safety occurrences was requested from BGC. Aircraft movements data were provided, but details of safety occurrences were yet to be provided at the time of writing.

Table 8 Consultation summary of findings

| ID | Bylaws | Community Safety | Economic opportunity | Lease site | Maintain/Improve/Close | Management | Noise (Amenity) | Operational safety | Public Liability | Planning | Regulatory Compliance | Flight paths |
|-----|--------|------------------|----------------------|------------|------------------------|------------|-----------------|--------------------|------------------|----------|-----------------------|--------------|
| 1. | | | x | | I | | | | | | | |
| 2. | | | | | | x | | | | | | |
| 3. | | | x | | M | | | | | | | |
| 4. | | x | | | C | | x | | | x | | |
| 5. | | | | x | I | x | | | | | | |
| 6. | x | x | | | | | x | | | | | |
| 7. | | | x | | I | x | | x | | x | | |
| 8. | | x | | | C | x | x | | x | | | |
| 9. | | | | x | I | x | | x | | | | |
| 10. | | | | | | | x | | | | | |
| 11. | | | x | | | | | | | | | |
| 12. | | x | | | M | x | x | | | x | | x |
| 13. | | | x | | M | | | | | | | |
| 14. | | | | | M | | | x | | | | |
| 15. | | | | | M | | | x | | x | | |
| 16. | | | | | M | x | x | | | | | x |
| 17. | | | | | | x | | | | | | |
| 18. | | | | | I | | | | | | | |
| 19. | | | | | M | | | | | | | |
| 20. | | x | | | | | x | | | | | x |
| 21. | | | | | M | | x | | | | | |
| 22. | | | | | | | x | | | | | |
| 23. | | | | | M | | | | | | | |

| <i>ID</i> | <i>Bylaws</i> | <i>Community Safety</i> | <i>Economic opportunity</i> | <i>Lease site</i> | <i>Maintain/Improve/Close</i> | <i>Management</i> | <i>Noise (Amenity)</i> | <i>Operational safety</i> | <i>Public Liability</i> | <i>Planning</i> | <i>Regulatory Compliance</i> | <i>Flight paths</i> |
|-----------|---------------|-------------------------|-----------------------------|-------------------|-------------------------------|-------------------|------------------------|---------------------------|-------------------------|-----------------|------------------------------|---------------------|
| 24. | | | | | M | | | | | | | |
| 25. | x | | | x | M | x | | | x | x | x | |
| 26. | | | | x | | | x | x | x | x | | |
| 27. | | | | x | I | x | | x | x | x | x | |

5. RISK CRITERIA

5.1. Introduction

A risk management framework is comprised of likelihood and consequence descriptors, a matrix used to derive a level of risk, and actions required of management according to the level of risk.

5.2. Likelihood

Likelihood is defined in AS/NZS ISO 3100:2009 as the chance of something happening. Likelihood descriptors used in this report are as indicated in the table below.

Table 9 Likelihood Descriptors

| <i>No</i> | <i>Descriptor</i> | <i>Description</i> |
|-----------|-------------------|---|
| 1 | Rare | The event may occur only in exceptional circumstances |
| 2 | Unlikely | The event could occur at some time (not known to have occurred) |
| 3 | Possible | The event might occur at some time in the future |
| 4 | Likely | The event will probably occur in most circumstances (has occurred infrequently) |
| 5 | Almost certain | The event is expected to occur in most circumstances (has occurred frequently) |

5.3. Consequence

Consequence is defined as the outcome of an event affecting objectives, which in this case is the safe and efficient operation of aircraft, people safety, potential effect on crew, security and the environment. The consequence descriptions are outlined in Table 10.

Table 10 Consequence descriptors

| No | Descriptor | People Safety | Property | Environment | Financial (loss or gain) |
|----|---------------|---|--|--|--------------------------|
| 1 | Insignificant | Minor injury – first aid treatment | Superficial damage | No effects or effects below level of perception | <\$50,000 |
| 2 | Minor | Significant injury – outpatient treatment | Moderate repairable damage – property still performs intended functions | Minimal site impact – easily controlled. Effects raised as local issues, unlikely to influence decision making. May enhance design and mitigation measures. | \$50,000-\$500,000 |
| 3 | Moderate | Serious injury - hospitalisation | Major repairable damage – property performs intended functions with some short term rectifications | Moderate site impact, minimal local impact, and important consideration at local or regional level, possible long term cumulative effect. Not likely to be decision making issues. Design and mitigation measures may ameliorate some consequences. | \$500,000 - \$5M |
| 4 | Major | Fatal or permanent injury | Major damage rendering property ineffective in achieving design functions without major repairs | High site impact, moderate local impact, important consideration at state level. Minor long term cumulative effect. Design and mitigation measures unlikely to remove all effects. | \$5M-\$25M |
| 5 | Catastrophic | Multiple Fatalities | Damaged beyond repair | Catastrophic site impact, high local impact, national importance. Serious long term cumulative effect. Mitigation measures unlikely to remove effects. | >25M |

5.4. Risk matrix

The risk matrix, which correlates likelihood and consequence to determine a level of risk, used in this report is shown in Table 11.

Table 11 Risk Matrix

| | | CONSEQUENCE | | | | |
|------------|---------------------|--------------------|------------|---------------|------------|---------------|
| | | INSIGNIFICANT 1 | MINOR 2 | MODERATE 3 | MAJOR 4 | CATASTROPHICS |
| LIKELIHOOD | ALMOST CERTAIN 5 | 6 | 7 | 8 | 9 | 10 |
| | LIKELY 4 | 5 | 6 | 7 | 8 | 9 |
| | POSSIBLE 3 | 4 | 5 | 6 | 7 | 8 |
| | UNLIKELY 2 | 3 | 4 | 5 | 6 | 7 |
| | RARE 1 | 2 | 3 | 4 | 5 | 6 |

5.5. Actions required

Actions required according to the derived level of risk are shown in Table 12.

Table 12 Actions Required

| | | |
|------|----------------------------|--|
| 9-10 | Unacceptable Risk - | Immediate action required by either treating or avoiding risk. Refer to executive management. |
| 7-8 | Manageable Risk - | Treatment action is required to manage risk to an acceptable level. Refer to operational management. |
| 5-6 | Manageable Risk - | Treatment action possibly required to achieve As Low As Reasonably Practicable (ALARP) - conduct cost/benefit analysis. Relevant manager to consider for appropriate action. |
| 0-4 | Acceptable Risk - | Managed by routine procedures, and can be accepted with no action. |