
Queenstown and Invercargill

Proposed amendments to controlled airspace

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Introduction

Airways Corporation of New Zealand (Airways) has submitted a petition to CAA to amend:

- enroute controlled airspace between Queenstown and Invercargill aerodromes;
- the terminal control areas surrounding Invercargill aerodrome; and
- reduce the size of the Invercargill control zone.

The Director has designated controlled airspace to protect the routes of IFR aircraft (primarily scheduled passenger transport services) arriving and departing from Queenstown and Invercargill aerodromes.

An instrument approach consists of five segments – the arrival, initial, intermediate, final and missed approach segments. The missed approach procedure is complete when an aircraft is in a position to either commence another approach, enter a holding pattern or divert to another aerodrome.

Proposed changes

Airways has applied the following containment criteria when designing the airspace:

VOR approach inbound legs	VOR splay
RNAV approach inbound legs	VOR splay
Missed approach tracks - VOR and RNAV	2 NM buffer between nominal track and airspace boundary
RNAV SID and STAR tracks	2 NM buffer between nominal track and airspace boundary
Holding patterns except ROCKS	Basic area of holding pattern plus 1 NM
ROCKS holding pattern	Basic area of holding pattern plus 1 NM but limited to 5 NM beyond the 25 NM DME fix for the HP outbound leg

Airways request the following changes:

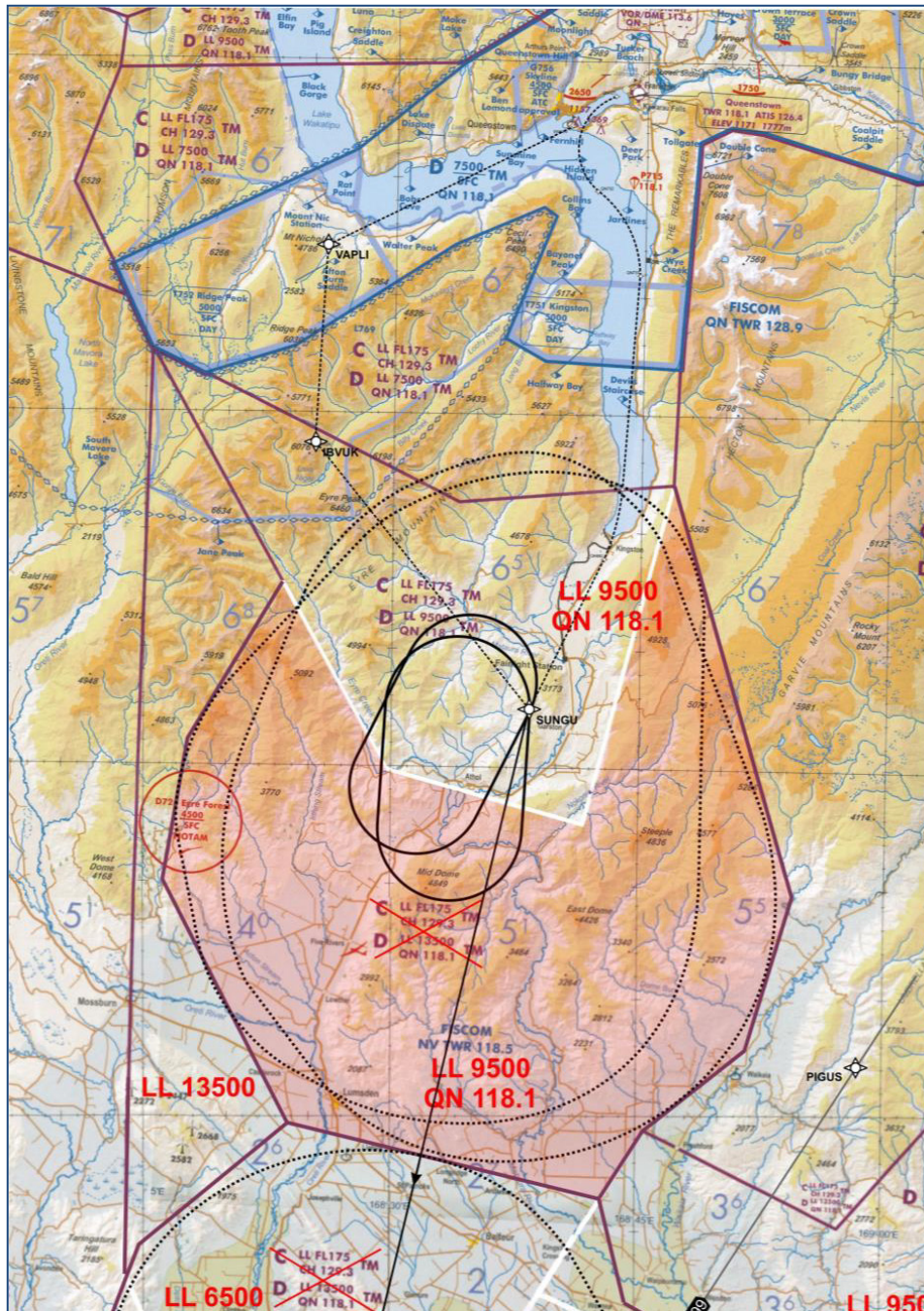
1. Queenstown CTA – SUNGU holding pattern airspace

Airways has petitioned CAA to lower the Queenstown control area (CTA) to the south of Queenstown to 9500 ft to provide airspace containment for IFR flights in the SUNGU holding patterns at 10,000 ft and above.

This airspace would be classified as Class C as part of the re-classification of the Queenstown control areas and control zone (CTR).

Refer to Figure 1.

Figure 1 – Proposed amendment to Queenstown CTA



Airways' petition states:

One SUNGU holding pattern is associated with the Queenstown RNAV STAR RWY 05, RNAV STAR RWY 23 and RNAV (GNSS) G missed approach and the other is associated with the Queenstown RNAV (RNP) Y RWY 05 and RNAV (RNP) Y RWY 23 missed approaches.

The diagram [Figure 1] depicts the proposed lowered controlled airspace highlighted light red. The white line is the deleted part of the existing CTA LL 9500 ft boundary. The two SUNGU holding patterns are depicted along with their protection areas shown as dotted lines. Also depicted are missed approach tracks to SUNGU and the track SUNGU to ANOPA/NV.

The purposes of lowering the CTA in that area are to:

1. provide controlled airspace containment for the IFR holding patterns at SUNGU reporting point down to 10,000 ft; and
2. improve efficiency of air traffic management of IFR flights to and from Queenstown including better usage of the bad-weather Queenstown to Christchurch QNCH4 route (intended for turbo-props) which tracks via SUNGU; and
3. along with the requested Invercargill CTA changes, allow IFR flights that have flown a missed approach at Queenstown to divert to Invercargill at 10,000 ft or above within controlled airspace; and
4. along with the requested Invercargill CTA changes, provide controlled airspace containment for IFR flights operating between QN and NV on the QN – SUNGU – NV IFR route Q787 down to 10,000 ft.

Reasons for lowering the airspace are:

1. Airline operations at QN generally require containment inside controlled airspace, therefore, aircraft holding at SUNGU currently need to be at FL150 or above. With the airspace lowered to 9500 ft in that area, the IFR airline flights would be able to hold at SUNGU at 10,000 ft or above and the instrument approach charts could be amended to reflect that.

With lowered airspace, aircraft wouldn't need to climb to FL150 on the missed approach – they could stop their climb at 10,000 ft and this would benefit the IFR flights needing to hold at SUNGU following a missed approach to RWY 23 or RWY 05.

Recent Queenstown IFR movement data indicates that there are around 6,300 IFR flights arriving at Queenstown per year.

2. When successive IFR aircraft are flying the missed approach to SUNGU they need to climb to FL150 or above. In these situations, the leading aircraft cannot terminate the missed approach path and return towards Queenstown for another approach until it climbs to and reaches FL160 – 1000 ft above the level the following aircraft is climbing to.

With the lowered airspace and the missed approach holding level lowered to 10,000 ft, the leading aircraft could terminate the missed approach once at or through 11,000 ft – 1000 ft above the level the following aircraft is climbing to. Therefore, when there is following traffic, aircraft on a missed approach can return to Queenstown for another approach 4-8 minutes sooner than with the existing airspace design.

3. *Where multiple IFR flights are waiting to fly an approach to QN in weather conditions where a missed approach is possible, the gap between the aircraft needs to be such that separation will be assured throughout the approach and the missed approach including holding at SUNGU.*

Lowering the airspace to 9500 ft and therefore being able to hold aircraft at SUNGU down to 10,000 ft will allow a reduction in the gap required for separation between the aircraft flying an approach – particularly when the leading aircraft is a turboprop and the following aircraft is a jet.

Currently, to ensure that separation will remain in place between successive aircraft that could fly the missed approach, the following aircraft can't commence the missed approach before the leading aircraft is above the level the following aircraft will climb to (FL150). For example, with an ATR leading and on a missed approach, ATC currently needs the ATR to be at FL160 prior to a subsequent jet reaching the missed approach point. This means that there is a 12 minute minimum spacing between the ATR and jet.

If the holding pattern was lowered, the ATR would only have to be at 11,000 ft before the jet reaches the missed approach point because the jet would be climbing to only 10,000 ft in the event of a missed approach. Therefore the gap between the aircraft could be lessened to 9 minutes. Although this seems small (3 minutes) it does add up as QN has 6-8 ATRs per day so there could be an overall reduction in delays for following arriving aircraft of up to 24 minutes per day.

4. *The same gap principle applies with ATR departures ahead of jet arrivals. Currently ATC need a 15 minute minimum gap (due to the circling element and therefore they are not always in a continuous climb) to get ATR traffic on a SUNGUI1S, SUNGUI1Q or Frankton 4 departure away in front of a jet on approach to RWY 23. By reducing the missed approach altitude the minimum gap can be reduced to 10 minutes, a 5 minute reduction.*
5. *Currently ATRs avoid if possible the SUNGUI1S, SUNGUI1Q or Frankton 4 departures to join the QNCH4 route due to the required 15 minute gaps and the subsequent delays incurred to the airline schedules. This has been to the detriment of some of the ATR operations as a number have had issues such as severe icing, experiencing severe turbulence, requesting emergency climb and other safety related issues whilst flying alternative departures and routes. When the gap between the departing ATR ahead of an arriving jet is reduced then delays due to the use of the departures onto the QNCH4 route are less. So, with lowered airspace, the departures and QNCH4 route are more likely to be used – thus more often avoiding the adverse weather conditions that would be experienced on the alternative departures and routes.*
6. *By lowering the airspace in this area, along with the requested changes to the NV CTA, aircraft flying the QN to NV Q787 route and aircraft diverting to NV would be able to do so at 10,000 ft or above within controlled airspace. This would benefit those aircraft, which currently need to climb to FL150/FL160 for airspace containment on that route.*

Information provided by Mt. Cook Airlines regarding their operations is that they diverted from QN 49 times in 2013, 46 times in 2014 and, as at July, 26 times in 2015. Most, if not all of those diversions were to Invercargill.

7. *In some situations where two or more aircraft are in the SUNGU holding pattern, if one of the aircraft diverts to Invercargill and this aircraft is higher than other aircraft in the SUNGU hold then the diverting aircraft will need to remain at FL160 (or higher) until it is at a point where it is horizontally separated from the lower aircraft in the SUNGU hold at FL150. That separation point is 27 NM from Invercargill. Once horizontally separated, the diverting aircraft can then commence descent to Invercargill. The descent from FL160 commencing at 27 NM from Invercargill requires a very steep descent profile. Descending in the ANOPA holding pattern to avoid the steep descent is not possible as the ANOPA holding pattern is not separated from the SUNGU holding pattern.*

By lowering the airspace to 9500 ft and therefore aircraft being able to hold at levels down to 10,000 ft helps to alleviate the steep descent profile into Invercargill in the situation described above.

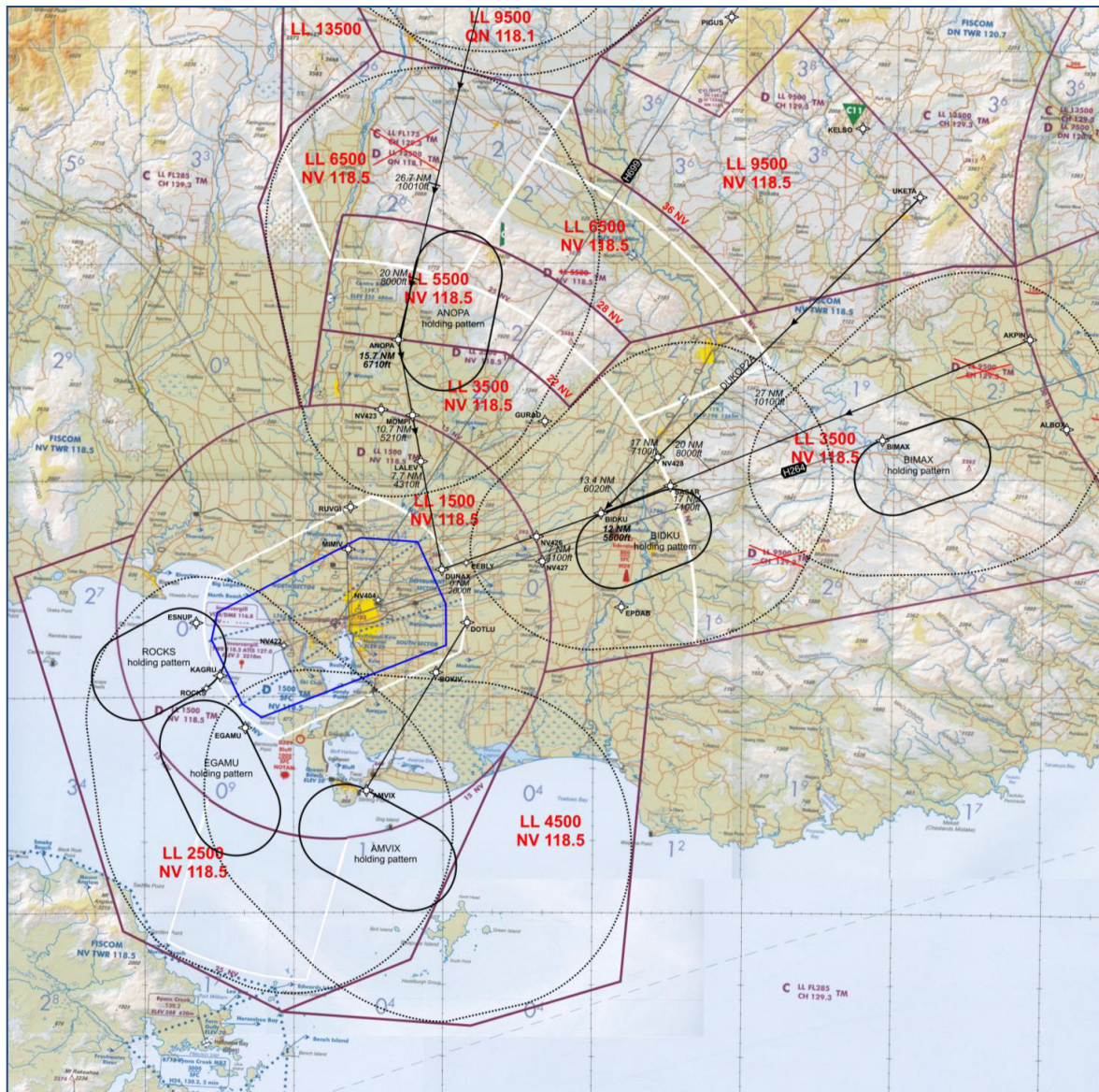
2. Invercargill CTA changes

Airways has petitioned CAA to change the Invercargill CTA as depicted in Figure 2 below. The white lines are the existing CTA boundary lines which would be deleted. The diagram also depicts the proposed change to the Invercargill CTR which is detailed in Section 3 of this document.

The dashed black lines show the holding pattern containment areas for the five holding patterns associated with Invercargill instrument procedures and the holding pattern BIMAX.

NOTE: This is a later version and differs from that detailed in Airways' Second Consultation Document. Airways now requests that the CTA between Invercargill and Dunedin is lowered to 3500 ft rather than to 4500 ft as in the Second Consultation Document and has not been specifically consulted with interested parties.

Figure 2 – Proposed amendments to Invercargill control areas



Reasons for amending the CTA

1. This request provides for correct containment of the Invercargill IFR departure, arrival and approach procedures including the following holding patterns;

- ANOPA (north of NV) at 7000 ft and above
- BIDKU (northeast of NV) at 5000 ft and above
- AMVIX (southeast of NV) at 5000 ft and above

- *EGAMU (southwest of NV) at 3000 ft and above*
- *ROCKS, a VOR holding pattern, (southwest of NV) at 3000 ft and above*

For this request, the VOR holding pattern at PEBLY (to the northeast of NV) would be disestablished and the VOR/DME RWY 04 missed approach amended to utilise the holding pattern overhead NV.

- 2. The requested lowered NV CTA along with the requested lowered QN CTA for the SUNGU holding pattern would also provide for airspace containment for IFR flights between QN and NV at 10,000 ft and above. This would benefit aircraft that are diverting to NV following a missed approach at QN and other IFR flights operating between QN and NV who currently need to climb to FL150/FL160 for airspace containment on that route. Information provided by Mt. Cook Airlines regarding their operations is that they diverted from QN 49 times in 2013, 46 times in 2014 and, as at July, 26 times in 2015. Most, if not all of those diversions were to Invercargill.*
- 3. The request would also alleviate an issue with the current airspace which is that IFR flights flying QN to NV need to be 14,000 ft or above for airspace containment until they are within 25 NM of NV. This results in a steep descent profile for an approach to NV RWY 22. Lowering the airspace to 9500 ft in the SUNGU area and the 6500 ft step at 40 NM from NV and the 5500 ft step at 28 NM helps to alleviate that issue.*
- 4. This requested CTA would also address the existing lack of containment of the DUKOP2B arrival to Invercargill.*

The diagram [Figure 2] depicts the current airspace and the DUKOP2B arrival for NV RWY 22 which is often used by IFR flights arriving from Christchurch. The profile levels at the default 300 ft per NM from DUNAX (the IAF/IF) at 2000 ft are also shown – i.e. at 27 NM from DUNAX the profile is 10,100 ft and at 17 NM from DUNAX 7100 ft.

The portion of the arrival indicated by the red circle is outside/beneath controlled airspace – the profile is 7100 ft to around 9400 ft which is beneath the 9500 ft CTA.

The requested airspace removes that lack of containment of the DUKOP2B arrival.

- 5. The requested CTA amendment would provide airspace containment for IFR flights to and from Dunedin (or further north) climbing/descending from cruising levels at 10,000 ft or above.*

For IFR flights flying between Invercargill and Dunedin at or above 10,000 ft, the existing NV CTA does not provide airspace containment for part of the NV RWY 22 arrival and NV RWY 04 departure and subsequent route at the default profile of 300 ft per NM.

The diagram below depicts the current airspace, the AKPIN1B arrival to Invercargill and the EPDAB1P departure and subsequent route to Dunedin. The 300 ft per NM profile levels are also shown. As indicated by the red box, between 25 NM NV and 30 - 35 NM NV, the profile of those tracks is below 9500 ft, the lower limit of the CTA.

The requested airspace removes that lack of containment of the AKPIN1B arrival and EPDAB1P departure and subsequent route to Dunedin.

6. *This request includes the lowering of CTA down to 3,500 ft between Invercargill and Dunedin.*

A number of IFR flights operate between DN and NV – these including commercial operations and IFR training operations. Typically, these flights operate between 4,000 ft and 7000 ft however, winter icing conditions common in this area often require these flights to operate at MSA 4000 ft. The lowered CTA to 3500 ft would facilitate the provision of traffic information to those IFR flights regarding VFR flights. One local operator has advised that they are very much in favour of lowering the airspace in this area to 3500 ft – stating that it makes safety- sense. Refer Feedback received – second round of consultation, response 20 on page 42.

Air traffic management issues have recently been identified regarding IFR flights between Dunedin and Invercargill. These issues mainly stem from the integration of IFR flights outside controlled airspace with IFR flights inside controlled airspace. The lowered CTA would address those issues.

This airspace would also contain the IFR holding pattern at BIMAX. The protection areas for the holding patterns at BIDKU and BIMAX overlap so the lowered CTA would facilitate ATC being able to manage use of those holding patterns so that conflicts are avoided. Also, with the BIMAX holding pattern contained within controlled airspace, ATC would be able to use the BIMAX hold when needed for air traffic management purposes.

7. *With the current airspace, the missed approach holding pattern at AMVIX (near Bluff) is not contained – nor are the holding patterns at EGAMU and ROCKS (both to the south-west of NV).*

The requested airspace would provide for correct containment of those holding patterns.

If the airspace changes go ahead, Airways intends to amend the NV VOR/DME RWY 22 approach such that the missed approach returns to overhead NV to hold and therefore the current missed approach holding pattern at PEBLY can be disestablished.

Like the existing NV CTA, the requested additional NV CTA would be class D airspace. Within class D airspace, ATC provide traffic information to IFR flights about VFR and to VFR flights about IFR and VFR flights. Except for Special VFR flights, separation is not provided between IFR and VFR flights in class D airspace. Therefore, Airways expects that the additional NV CTA would result in minimal, if any, additional restrictions to VFR flights in the Invercargill area.

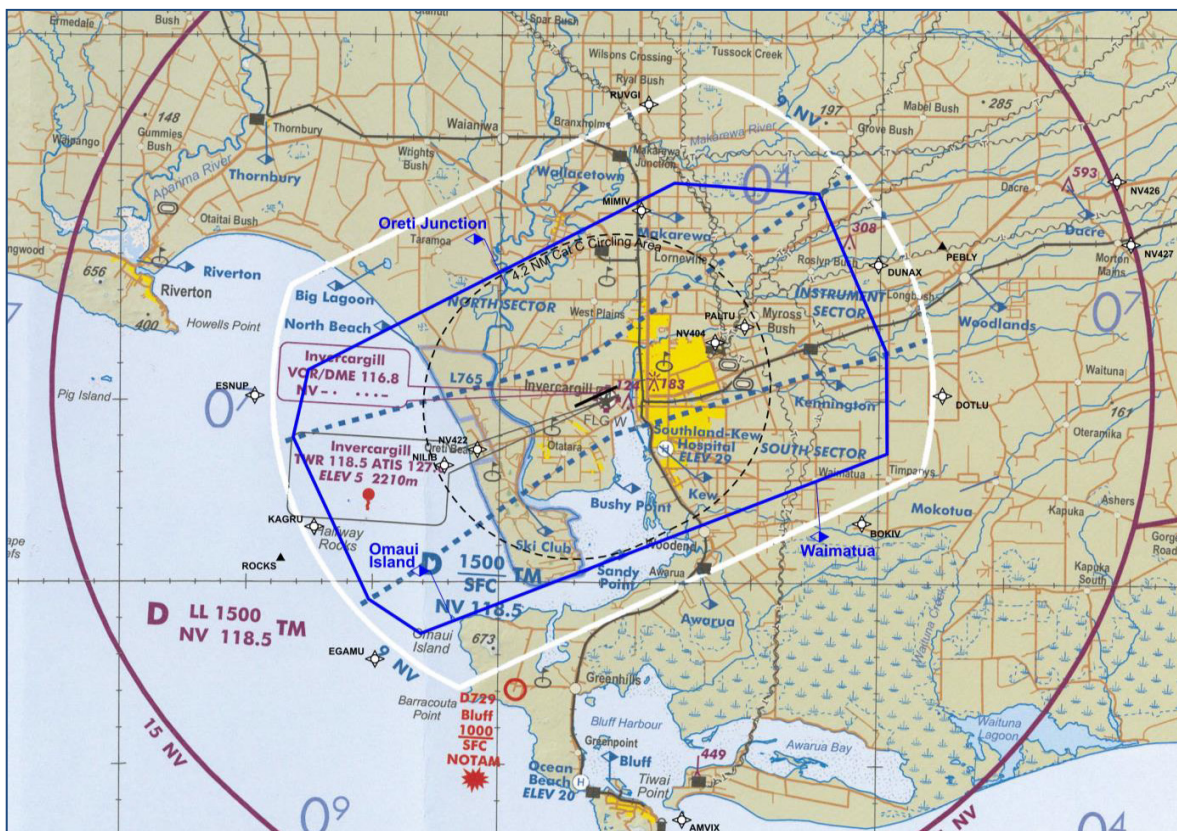
However, correctly containing the instrument procedures and holding patterns within controlled airspace will facilitate ATC being able to provide traffic information to the IFR flights flying those procedures about nearby VFR flights and to the VFR flights about the nearby IFR flights. Airways sees this as an enhancement of safety.

NOTE: The requested changes to the NV CTA including the lowering of the CTA between Invercargill and Dunedin mentioned in this petition stem from a review of the NV airspace. It is planned to review the Dunedin (DN) airspace during 2016. The DN airspace review may result in a request for the lowered CTA between NV and DN to be split into two airspaces – the southern portion being NV CTA and the northern portion being DN CTA. Also, the south-eastern boundary of the lowered CTA may need adjustment once the various DN holding patterns have been reviewed for correct airspace containment.

3. Reduce size of Invercargill CTR

Airways has requested that the Invercargill CTR is amended as per the blue line as depicted in Figure 3 below. The white line is the existing CTR boundary and the dashed black line is the Cat C circling protection area.

Figure 3 – Amended Invercargill control zone



In their petition, Airways state:

The upper limit of the CTR would remain at 1500 ft.

The requested CTR would be sufficient to;

- *provide containment of the existing IFR approach and departure procedures; and*
- *provide containment of the IFR circling approach areas for Cat A, B and C aircraft but not for Cat D aircraft.*

- *contain jet aircraft entering/operating in/leaving the NV circuit.*

The primary purpose of reducing the size of the NV CTR is to reclassify as class G (uncontrolled) airspace that is no longer needed for containment of instrument flight procedures and/or the management of air traffic at Invercargill aerodrome.

Associated with the changed CTR boundary, Airways is requesting three new visual reporting points (VRP) – Oreti Junction, Omaui Island and Waimatua – along with the disestablishment of the existing Mokotua VRP. (Also note the Sandy Point VRP symbol would need to be moved.)

Consultation undertaken by Airways

During late August and September 2015 Airways carried out consultation regarding possible changes to controlled airspace between Queenstown and Invercargill (NV), other changes to the Invercargill control area (NV CTA) and changes to the Invercargill control zone (NV CTR). A copy of that Consultation Document was also emailed to CAA (Paula Moore) on 20/8/2015.

Airways received a number of responses to its request for feedback. In summary the responses were:

- *One respondent (Gliding New Zealand) was strongly opposed to the proposals to lower the CTA and proposed changes to instrument flight procedures to avoid/reduce the need for lowered CTA.*
- *Three respondents were supportive of the proposal to lower the CTA between QN and NV.*
- *A number of respondents had no issues with the proposals.*
- *One respondent proposed that the NV CTA should be further amended to ensure all IFR arrivals, holding patterns and departures are contained by controlled airspace.*
- *One respondent did not support the reduction in size of the NV CTR to less than that needed for containment of IFR Cat C circling.*

Following consideration of the feedback received and other issues that had since arisen, Airways amended the proposal so that it would;

1. *provide for full containment of the ANOPA and BIDKU holding patterns and the three holding patterns to the south of Invercargill; and*
2. *provide for CTR containment for Cat C circling; and*
3. *lower the CTA between Invercargill and Dunedin to 4500 ft (which would also contain the BIMAX holding pattern)*

A second consultation document dated 20 November 2015 was sent to interested parties.

The proposal was also raised at the Airways National Customer Liaison Meeting (NCLM) held in Christchurch 26 November 2015.

The feedback Airways received to the Second Consultation Document was;

- 1. At the NCLM, Gliding New Zealand expressed their opposition to the proposal.*
- 2. At the NCLM, other operators did not express opposition.*
- 3. Gliding New Zealand (Trevor Mollard) met with Airways on 30 November 2015 to discuss the proposal – reiterating opposition.*
- 4. Three written responses with no opposition expressed.*
- 5. One written response very much in favour of the CTA lowered to 3500 ft between NV and DN*

Airways considered all the feedback received and has determined to submit this petition.

The feedback from the first round of consultation regarding lack of full containment of NV holding patterns is addressed – petition now provides for full containment.

The feedback from the first round of consultation regarding lack of containment of NV Cat C circling area is addressed – petition now provides for full containment.

The Gliding New Zealand feedback from the first and second rounds of consultation expressing opposition to the lowered QN and NV CTA is noted by Airways. Airways response is;

- 1. The Airways understanding is that the airspace in question is not used by gliding on a daily basis - that it is used by them on average less than 50% of the time. On the other hand, the advantages to airlines and air traffic management the lowered airspace would bring would occur much more often.*
- 2. Regarding the lowered QN CTA, which is intended to become Class C, VFR operators are still entitled to request clearance to operate within that airspace and ATC intends to accommodate those requests in accordance with traffic priorities as published in AIPNZ ENR 1.1 – 31 section 10 Traffic Priorities.*

Additionally, Airways is considering requesting the establishment of a GAA and/or an ATS sector that would be separated from the IFR tracks from QN to SUNGU but not the SUNGU holding pattern. Such GAA/Sector may be used for the management of VFR flights – particularly when pre-arranged, organised VFR events are being conducted.

- 3. Regarding the lowered NV CTA, this airspace would be Class D within which ATC is not required to separate VFR flights from IFR flights. Therefore, Airways expects that the additional NV CTA would result in minimal, if any, additional restrictions to VFR flights in the Invercargill area.*

The feedback from the second round of consultation included one operator being very much in favour of lowering the CTA between NV and DN to 3500 ft stating that, in light of

*an incident it makes safety sense. The Airways position is that CTA lowered to 3,500 ft would benefit air traffic management more than if it was lowered to only 4,500 ft. Therefore, our consideration of the feedback has resulted in this petition requesting the CTA lowered to 3,500 ft. **NOTE that this is lower than covered in the consultation carried out by Airways.***

Summary

Overall there will be an increase in the volume of controlled airspace. As stated earlier, the Director has designated controlled airspace to protect IFR aircraft arriving and departing from Queenstown and Invercargill aerodromes. Controlled airspace enables an air traffic control service to be provided for the safety and efficiency of aircraft operations.

The changes would enable:

- Lower holding at SUNGU for IFR aircraft having completed a missed approach at Queenstown aerodrome
- Containment of turbo-prop aircraft on the Queenstown-Invercargill route at the preferred, and most efficient, level of 10,000 ft
- Containment of standard descent profile for arrivals into Invercargill from Queenstown and Christchurch
- Raising the lower limit of controlled airspace across Foveaux Strait to 2500 ft

As has been observed by Airways, most of this airspace will be classified as Class D, where separation is not provided between IFR and VFR aircraft. There should be little to change to VFR operations except the requirement to obtain a clearance for entry into the CTA, and should result in minimal change to VFR operations in the area.

IFR aircraft will receive improved traffic information about nearby VFR aircraft, and VFR aircraft about nearby IFR aircraft. This will result in improved safety for both.

Consultation List

This document will be sent directly to the following organisations:

- Air New Zealand Group – including Mt Cook and Air Nelson
- Aircraft Owners and Pilots Association
- Airways Corporation of New Zealand
- Croydon Aircraft Company
- Dunedin/Taieri User Group
- Flying New Zealand
- Foveaux User Group

- Gliding New Zealand
- Gore Aero Club
- Heli Otago
- Heliventures NZ
- Invercargill Airport Ltd
- Jetstar
- Mainland Air
- New Zealand Hang Gliding and Paragliding Association
- Otago Aero Club
- Phoenix Aviation
- QANTAS
- Queenstown Milford User Group
- Recreational Aircraft Association of New Zealand
- Royal New Zealand Air Force
- Southern Wings/Southland Aero Club
- Stewart Island Flights/South East Air
- Sport Aircraft Association New Zealand
- Sport Aviation Corp
- Southern Lakes Helicopters
- Virgin Australia

Electronic notification of the consultation will be sent to subscribers to the CAA email Notification Service for Airspace Notifications Briefing Area NZ 7, 9 and 10.

This document is also available on the CAA website at the following link:

http://www.caa.govt.nz/airspace/airspace_review.htm

Submissions

Prior to making a designation or classification of airspace, Civil Aviation Rule 71.9 requires the Director to consult with all parties that may be affected within the aviation industry.

This document forms part of the consultation process. Submissions are sought from any interested person, organisation or representative group to provide further information relevant to this proposal.

Submissions are accepted either electronically or via mail.

Please address submissions to:

Group Executive Officer
Aviation Infrastructure and Personnel
Civil Aviation Authority of New Zealand
PO Box 3555
Wellington 6140

Fax: 04 569 2024

Email: dianne.parker@caa.govt.nz

Reference – Queenstown and Invercargill proposed amendments to controlled airspace.

Closing date for submissions is **Thursday 25 February 2016**.

Further information

For further information contact:

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