
Queenstown Class C Airspace Application of Separation

This document outlines the application of separations within Queenstown airspace by Airways in the event that the Director of Civil Aviation changes the classification to Class C

Version 1.0
15 April 2014

1 Introduction

This Airways document explains how ATC (Airways) would provide required separations within Queenstown controlled airspace in the event that the Director of Civil Aviation changes the classification of the airspace from existing Class D to Class C.

If the CAA does change the classification of Queenstown airspace to Class C, it will be Airways requirement to manage the airspace in accordance with the new classification.

Airways was asked to produce this document explaining how ATC would manage the airspace if it was changed to Class C. Nothing in this document can be taken as Airways being in support of or in opposition to a change in classification to Class C.

Civil Aviation Rule Part 71.105 and Part 71.107 lays out the separation and traffic information requirements applicable to Class C and Class D airspace. Those rule parts are available from the CAA website.

The prime difference between Class C and Class D airspace is that;

- within Class C airspace, ATC must have a form of separation in place between IFR flights and VFR flights; whereas
- in Class D airspace separation is not required between IFR flights and VFR flights but traffic information must be passed by ATC.

In the event that the Director of Civil Aviation does change the classification of Queenstown controlled airspace to Class C then ATC will need to have a form of separation in place between IFR flights and VFR flights.

Various VFR operations take place within Queenstown controlled airspace (both the QN control zone and the QN control areas).

This document is divided into various sections – each section dealing with a particular type of VFR operation.

The sections are;

Section	Description	Page
2	VFR Milford Traffic – NZQN RWY 23 Operations and NZQN RWY 05 Operations	4
3	Helicopter Operations within QN CTR	16
4	G755 Coronet Peak	17
5	G753 Crown Terrace	22
6	G756 Skyline	24
7	Wanaka Parachuting	25
8	Glenorchy Parachuting	27
9	Jardines Parachuting	29
10	Figure Eight Airline Traffic Circuit	31
11	Other Proposed Changes to VFR Procedures	32
12	Upper Airspace Changes	33

If a person or operator requires further information regarding separation requirements applicable to their particular operation or if their particular operation is not covered by this document then please direct your enquiries to;

Clayton Lightfoot

Chief Controller

Queenstown Tower

Private Bag 50075

Queenstown

Phone: 03 450 9525

Mobile: 027 4699627

Email: clayton.lightfoot@airways.co.nz

Any other correspondence relating to this document should be to Clayton Lightfoot at the contact details given above.

2 VFR Milford Flow Traffic

2.1 NZ QN Runway 23

The Queenstown – Milford arrival flow was set-up many years ago to reduce the amount of opposite direction traffic to and from Milford. When Queenstown runway 23 is in use, VFR departures to Milford route out via Moonlight and Skippers Saddles and generally return via the published VFR South Arrival which was created to assist with this flow.

VFR Departures to Milford

Under Class C, ATC would need to formally separate Milford Flow VFR departures from IFR flights.

Airways intends to manage this by retaining the existing outbound flow via Moonlight and Skippers Saddles applying a combination of visual and geographic separation between these VFR flights and IFR flights.

VFR Arrivals from Milford

Under Class C, ATC would need to formally separate VFR aircraft flying the South arrival from the IFR tracks, including the entry into the figure 8 and the missed approach for runway 23.

Airways has considered this situation and propose that the South Arrival is amended to be at or below 2,200ft AMSL from a new visual reporting point 'Gully' and Hidden Island to the aerodrome and the IFR departures and missed approach off runway 23 are required to climb to reach 2,700ft AMSL or above by a point in the Frankton Arm. Thus, the IFR departures would be vertically separated from the South Arrival by at least 500ft before coming within 1.5 NM horizontally. Refer *Figure 1* next page.

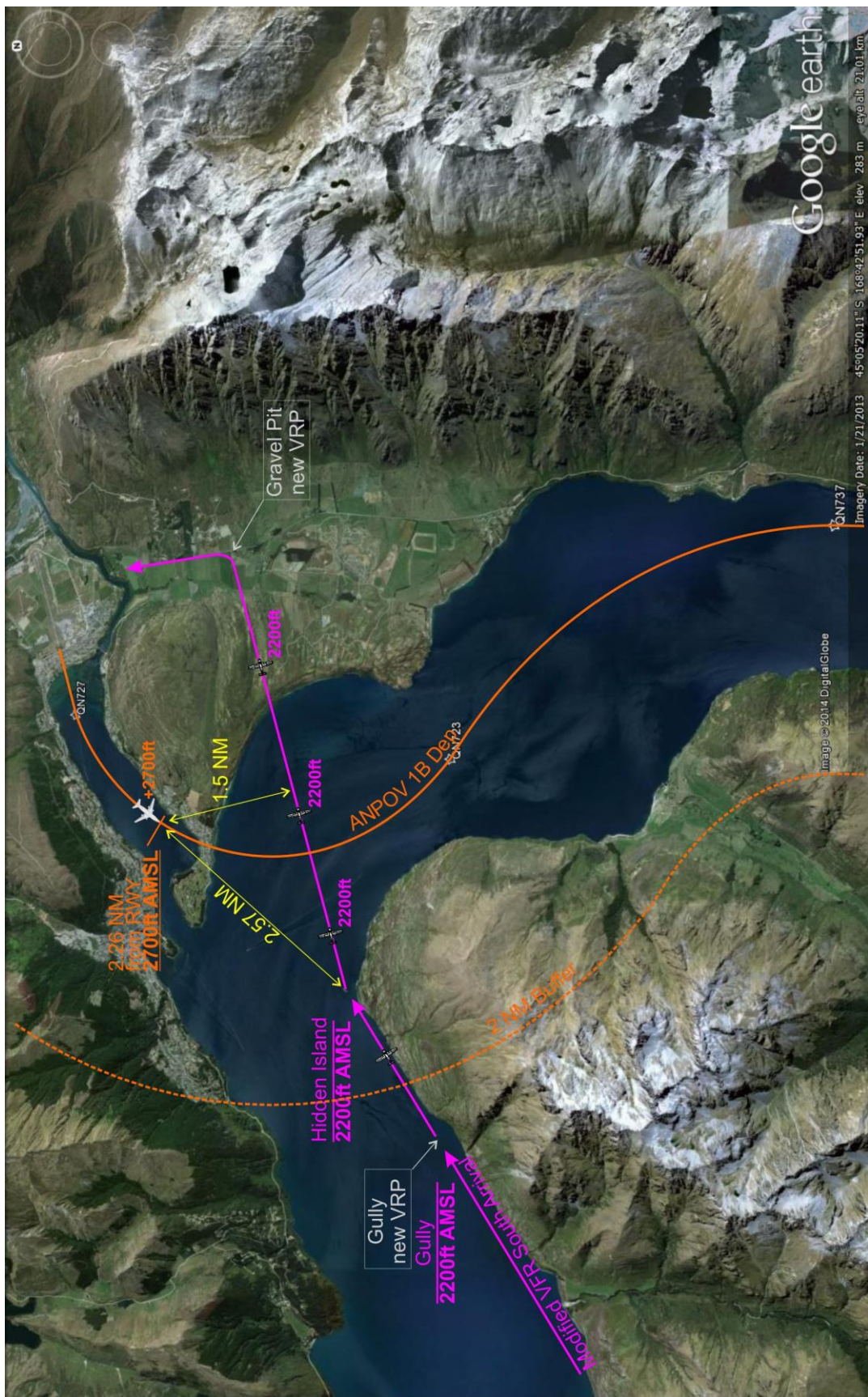


Figure 1 – Proposed separation of Milford arrivals from runway 23 RNAV (RNP) departures and missed approach.

Airways has discussed this with the 'Milford flow' operators – our understanding is that they are not happy with the lower level (2200 ft rather than existing 3500 ft) over the lake but agree that it is probably preferable to holding west of Hidden Island or routing all Milford arrivals and departures via Skippers Saddle and Moonlight Saddle.

Airways believe that helicopter operators would not be able to accept the lower level (2200 ft) over the lake. Airways would handle these helicopter operations by either;

- holding them on the ground until another form of separation (e.g. visual separation) is in place or separation no longer required; or
- route the helicopter via alternative routes that are geographically separated from the IFR unless another form of separation (e.g. visual separation) is in place or separation no longer required.

Airways has discussed this concept with Air New Zealand (jets), QANTAS, JetStar and Virgin Australia and all agree that their jets could achieve the climb requirement to reach 2700 ft AMSL by the specified point. These airlines have provided Airways with evidence that the requirement can be achieved and Airways has some evidence from Skyline¹ to confirm this.

Some research and discussions would still need to take place to determine how best to implement the requirement – options include incorporating the requirement into the published SID and missed approach or including the requirement on the NZQN Arrival/Departure page.

Airways has also discussed this concept with Mt. Cook Airlines and their information is that most times their ATR will be able to achieve 2700 ft by the specified point but at high weights they may not achieve it.

All of the departures flown by the ATR off runway 23 involve an initial climb in VMC along the Frankton Arm and then around Deer Park hill. To provide separation between these departing ATRs and the Milford VFR traffic on the South Arrival, the ATR would be instructed to reach 2700 ft or above by abeam Kelvin Heights near the southern end of the Frankton Arm. Refer *Figure 2* next page.

In the event that a pilot advised that they could not achieve that requirement then either;

- composite visual separation would be applied if the situation was suitable; or
- the VFR traffic would be held west of Gully VRP; or
- the ATR's departure held until the VFR traffic was clear.

¹ Skyline. Various references in this document are made to Skyline. Skyline is the surveillance system (radar screens) used by Airways.

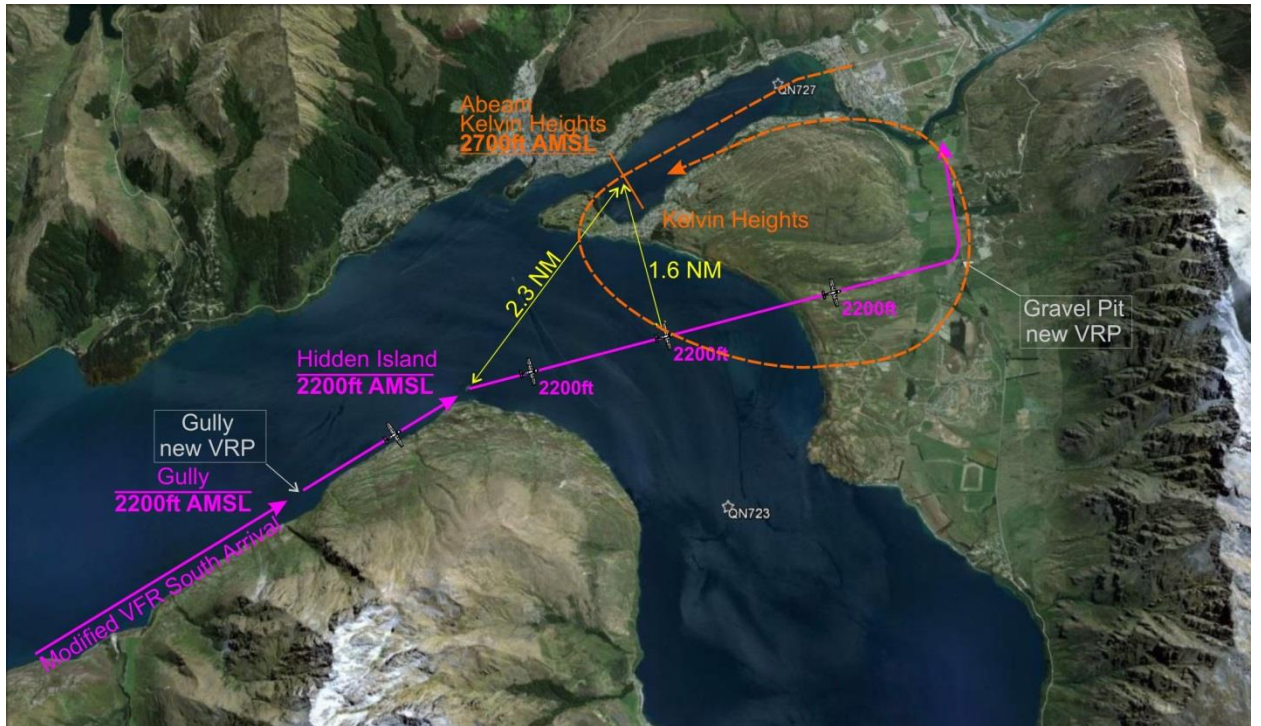


Figure 2- Proposed separation of Milford arrivals from runway 23 RNAV (GNSS) departures.

Points regarding this proposal;

1. The South Arrival is laterally displaced from the initial track of the IFR departure by not less than 1.5 NM to the point at which vertical separation is established.
2. An advantage of this proposal is that the path of the Milford arrival flow via the South Arrival is the same as existing - thus not requiring complete 'rebuild' of the existing VFR flows to and from Milford.
3. A disadvantage to the VFR aircraft is the lower level from Hidden Island to the aerodrome.
4. Helicopter operators would not accept the lower level at Hidden Island over the water and would either hold on the ground or look for alternative tracking outside the buffers.
5. Deer Park hill is a natural physical feature lying between the VFR South Arrival and the initial departure track of the instrument departures. Airways maintain that this hill will add to the surety that the VFR arrival flow will be horizontally clear of the IFR departures.

The aforementioned proposal would be subject to a safety assessment/safety case.

More detail about this proposal follows;

The VFR South Arrival would be amended to be:

① South Arr Enter the zone and track via Mount Nic Station, Walter Peak, Gully, Hidden Is, south of Deer Park to Tollgate Gravel Pit remaining north of and clear of Jardines PDS, 7500 ft or below.

Be 3500 2200 ft or below passing Hidden Island Gully, report crossing shoreline south of Deer Park, then:

For RWY 14 — join left-hand downwind not below 2700 ft until east of highway

For RWY 23 — cross overhead, join right-hand downwind, not below 2700 ft until east of highway

For RWY 05 — cross overhead, join left-hand downwind, not below 2700 ft until east of highway

For RWY 32 — make straight-in approach

Note the proposed deletion of "Tollgate" VRP and addition of a new VRP "Gravel Pit". "Gravel Pit" is the intersection of SH6 and Woolshed Road. (Need a better name than Gravel Pit?) The purpose of Gravel Pit is to route the South Arrival via a more defined point than just the existing "south of Deer Park" to provide the 1.5 NM lateral displacement from the track of the IFRs prior to vertical separation being established.

Also note the addition of new VRP "Gully" which is located just outside a 2 NM buffer from the ANPOV1B departure. This new VRP would be established for the purposes of providing geographical separation against the ANPOV1B departure. It may be that the existing Hidden Island VRP could be disestablished with the introduction of new Gully VRP – although the South Arrival would still need to track via the Hidden Island geographical feature.

RNAV (RNP) ANPOV 1B Departure (off RWY 23)

RNAV (RNP) IPNOR 1B Departure (off RWY 23)

Refer *Figure 1*, a point would be established on the ANPOV1B/IPNOR1B 2.26 NM from the upwind threshold. This point is 2.57 NM away from Hidden Island and 1.5 NM laterally from the South Arrival. Flights would be required to reach 2700ft AMSL by this point.

RNAV (RNP) Y RWY 23 Missed Approach

Refer *Figure 1*. The missed approach for the RNP Y RWY 23 follows the same path as the ANPOV 1B departure. The proposal is to manage a missed approach in the same manner as for the departures – i.e. to reach 2700ft AMSL or above by a point 2.26 NM from the upwind threshold. Such a point would probably need to be incorporated into the missed approach procedure.

RNAV (GNSS) ANPOV 1D Departure (off RWY 23)
RNAV (GNSS) IPNOR 1D Departure (off RWY 23)
RNAV (GNSS) SUNGU 1Q Departure (off RWY 23)
NAV (GNSS) SUNGU 1S Departure (off RWY 23)
Frankton 4 Departure (off RWY 23)

Refer *Figure 2*. The visual segment of these departures would include a requirement to reach 2700ft AMSL or above by abeam Kelvin Heights – Kelvin Heights being within the Frankton Arm.

If the above proposal was unacceptable to CAA the alternatives are:

1. Holding all fixed wing inbound west of Hidden Island when there is an arrival or departure.

Airways believes that the local fixed wing Milford flow operators would consider this to be unacceptable and dangerous.

2. Bring all traffic to and from Milford in and out via Skippers Saddle and Moonlight Saddle, therefore having all VFR traffic, both fixed wing and helicopter, operating in a confined space to the north of the aerodrome. This becomes even more confined if there is IFR traffic on the GNSS approaches and departures.

Airways believes that the local fixed wing and helicopter operators would consider this to be unacceptable.

2.2 Feedback from Local Users

Airways believes that local fixed wing operators will have concerns with the lower level over the lake, but a much better option than the alternatives.

Airways believes that helicopter operators would not accept the lower level at Hidden Island over the water and would either hold on the ground or look for alternative tracking outside the buffers.

2.3 Feedback from Airlines

a. Andy Tasker, Virgin Australia

Hi Clayton,

Attached is our last 100 departures min Alt at 2.26nm is 2981’.

Regards Andy

ALT at 50' DER + 48 Sec (2.26nm)

3183	3339	3662	3420
3104	3713	3317	3269
3252	3562	3252	3174
3294	3667	3629	3387
3625	3845	3380	3390
3234	3200	3197	3405
3292	3414	3509	3401
3197	3251	3125	3289
2982	3306	3180	3489
3248	3084	3888	3708
3413	3213	3740	3564
3223	3691	3557	3506
3223	3667	3564	3445
3366	3667	4657	3375
3039	3428	3389	3311
3140	3377	3394	3429
3411	3335	3111	3732
3944	3337	3183	3467
3534	3352	3750	3514
3309	3233	3589	3194
3437	3375	3134	3731
3316	3249	3166	3481
3097	3494	3226	3294
3243	2995	3148	3186
3387	2981	3195	3276

b. Malcolm Taylor, Air New Zealand A320

Malcolm McAllister has run some numbers (see below). In essence, at Flap 3, 78.0 tonnes, ISA +20 deg C, nil wind, 160kt CAS, climbing from 1170 to 6000 the A320 can maintain a climb gradient of 7.32 degrees. I haven't done the maths, but I think that is comfortably above 12%, and it would be a rare day that we are at 75.0 T, certainly not on a missed approach.

FOR APPROVED DATA REFER TO FLIGHT MANUAL

CLIMB AT 1.30 VS1G

WEIGHT : 78000. KG ISA + 20.0 DG.C

100.0 % OF TON POWER

ALT.	ALTG	WGHT	MACH	CAS	TAS	WIND	TIME	FUEL	DIST	RATE	GRDT	ALPH	CL	CD	WFE	FN	EPR
(FT)	(FT)	(KG)	()	(KT)	(KT)	(KT)	(MN)	(KG)	(NM)	(FTMN)	(DEG.)	(DEG.)	()	()	(KG/H)	(DAN)	()
1170.	1252.	78000.	0.248	160.9	169.3	0.0	0.00	0.	0.0	2519.8	9.05	6.74	1.40126	0.10995	8796.	17948.	1.427
2000.	2140.	77951.	0.252	161.0	171.4	0.0	0.34	49.	0.9	2429.9	8.62	6.74	1.40154	0.10998	8761.	17800.	1.441
3000.	3210.	77891.	0.257	161.1	174.1	0.0	0.75	109.	2.1	2379.5	8.31	6.75	1.40164	0.11000	8594.	17387.	1.450
4000.	4282.	77830.	0.262	161.2	176.9	0.0	1.18	170.	3.4	2319.0	7.97	6.76	1.40185	0.11003	8417.	16936.	1.459
5000.	5353.	77770.	0.267	161.4	179.7	0.0	1.61	230.	4.6	2253.4	7.63	6.78	1.40203	0.11006	8229.	16471.	1.467
6000.	6425.	77709.	0.272	161.5	182.6	0.0	2.06	291.	6.0	2196.0	7.32	6.78	1.40184	0.11005	8066.	16054.	1.477

ABSTRACT OUTPUT FOR RATE OF CLIMB LIMIT NOT AVAILABLE DUE TO TOO MANY COMPUTATION WEIGHT VALUES

From this data (green highlight), you can see that the aircraft will be at 3000ft at 2.1Nm. This is inside the requirements for 2700ft by 2.26 Nm as per the diagram above.

c. Glenn Hillman, Qantas

Aaron Loi, one of our Performance Engineers has responded with some performance figures. I have summarised this to answer the questions you have asked.

1. Rwy 23 Departures, requirement to reach 2700ft AMSL by 2.26NM.

This represents an 11.1% climb gradient (using the ICAO SID criteria of 16ft over the DER).

$$[(2700' - 1160' - 16') / (2.26\text{NM} \times 6076')] \times 100 = 11.1\%$$

Performance Engineering advise the following indicative performance, which would satisfy this requirement.

Airframe: 737-800WSFP1 Engine: CFM56-7B-26 Airport: NZQN RWY23 Departures Wind: 0 KT Flap Position: 5 AC Bleed: Auto (On) AI Bleed: Off CG: FWD Gross Weight: 72500KG	
OAT (degrees celsius)	Climb Gradient (%) to 2700ft AMSL
0	15.1
5	15.1
10	15.0
15	15.0
20	14.9
25	14.9
30	14.2
35	13.2

2.4 Airways Supporting Evidence

Normal jet departures off RWY 23, photos from Skyline display.



Figure 3 – Photo of Skyline information showing the level of the jet near the end of the Frankton Arm. The green datablock has the mode C altitude information – first figures on second line (A040)



Figure 4 – Photo of Skyline information showing the level of the jet near the end of the Frankton Arm. The green datablock has the mode C altitude information – first figures on second line (A044)

2.5 New Wye Creek VFR Arrival

Airways is also proposing a new VFR arrival procedure for runway 23 that tracks via Hidden Island and Wye Creek, east of SH6 and new VRP "Gravel Pit".

The purpose of this is to manage circuit integration and create missed approach/go-around protection by extending the arrival track between Hidden Island and "Gravel Pit". This will also keep VFR aircraft clear of Jardines PDS. Airways believes that use of this arrival procedure when necessary is preferable to orbiting the multiple aircraft in the Milford flow west of Gully.

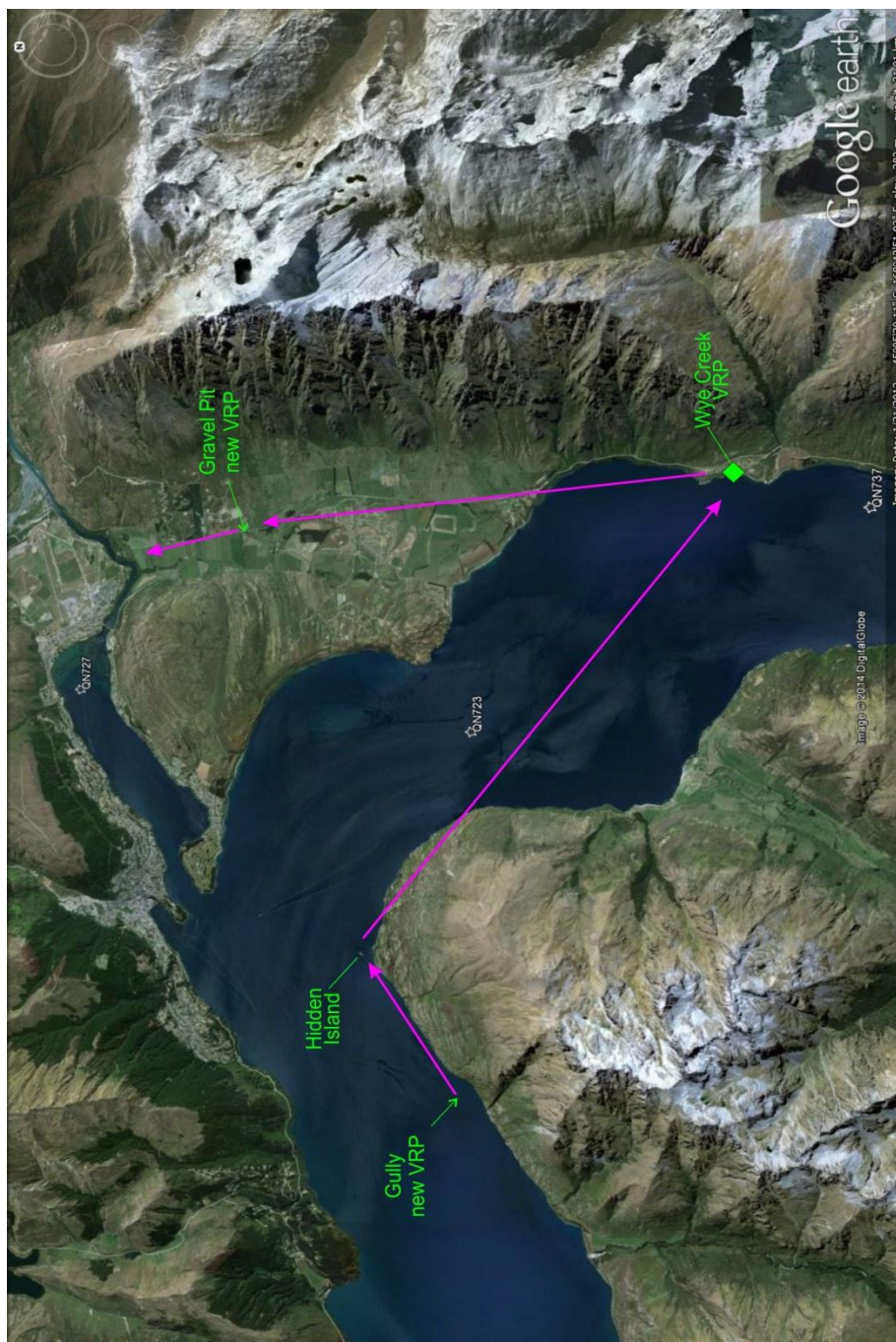


Figure 5 - Proposed new additional VFR arrival procedure.

2.6 VFR Milford Flow Traffic – NZQN Runway 05 Operations

VFR Departures to Milford

Airways intends to manage this by retaining the existing outbound flow via Moonlight and applying a combination of visual and geographic separation between these VFR flights and IFR flights.

VFR Arrivals from Milford

The existing VFR North arrival would be deleted.

VFR arrivals for runway 05 would be routed from Mt. Nic/Rat Point VRPs straight in for RWY 05 in front of arriving IFR flights applying visual separation. Where it was not going to be possible to have enough room in front of the IFR arrival, then the VFR aircraft would be held either outside the CTR or in T752 until the VFR traffic was able to sight and follow the IFR aircraft. Airways anticipate that any such holding should be limited to 3 to 4 minutes. Airways hopes to be able to develop with users a new procedure to be applied where necessary to extend the VFR tracking behind Mt Nic to position behind IFR flights on approach.

3 Helicopter Operations with QN CTR

Frequent and varied helicopter operations, predominantly commercial tourist operations, take place within the QN CTR. These operations are often to and from landing sites within the CTR.

ATC intends to separate these VFR helicopter flights from IFR flights by application of visual, vertical or geographical separation. Where no form of separation can be applied, the helicopter operation would need to hold on the ground (if within the CTR) or hold outside the CTR until a form of separation can be applied.

Airways will do what we can to have the geographical separation buffers from the IFR procedures made as narrow as possible.

Moving some regular helicopter landing sites to be within a sector geographically separated from the IFR procedures is likely to assist with minimising delays to some helicopter operations.

4 NZG755 Coronet Peak



Figure 6 - VNC depicting G755 Coronet Peak.

NZG755 Coronet Peak is a GAA SFC to 5500ft Active by Day. Being active by Day, it is active all day every day without reference to ATC and ATC has no authority regarding activation of the area.

Discussions between Airways and the regular operators (mainly paragliding) has revealed that any reduction in the size of G755 would have a major impact (if not complete prevention) on the operations within G755. It is also noted that the 5500ft upper limit of G755 is about level with the top of Coronet Peak – any lowering of the upper limit would have severe impact on their operations.

It is noted that the southern, significant to the IFR flights, boundary of G755 lies along Malaghans Road – a prominent geographical feature that is easily identified by G755 operators. From ASI data provided by Airways safety office, Airways is not aware of any infringements of this boundary within the last 5 years.

A number of instrument approach and departure procedures pass nearby to G755. Of those procedures, most pass nearby during the visual segment of the procedure. Advice from CAA is that during visual manoeuvring it is the pilot's responsibility for containment on these visual manoeuvres so see no issue here.

The remaining instrument procedures that pass nearby to G755 are;

- Missed approach segment of RNAV (RNP) RWY 05
- RNAV (RNP) ANPOV 1A departure
- RNAV (RNP) IPNOR 1A departure

Regarding these 3 instrument procedures, information from Air New Zealand jets is that an A320 would reach 6,000ft (500ft above G755) 6 NM from RWY 05. So, the A320 would be vertically above (by 500ft) G755 prior to reaching G755.

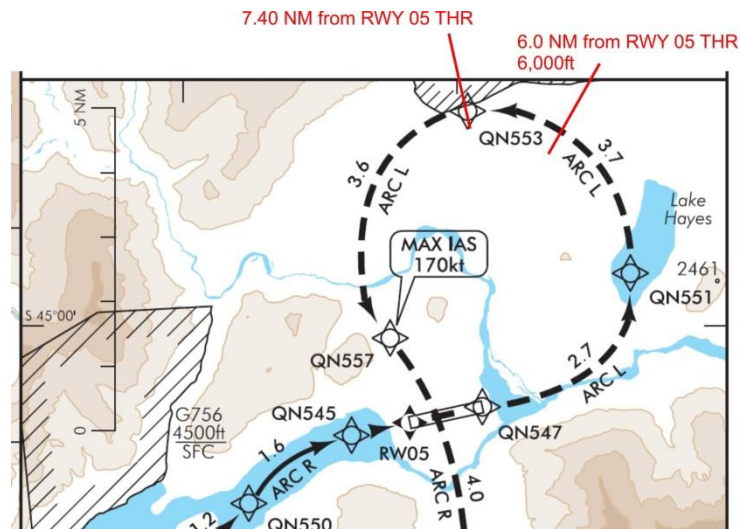


Figure 7 - RNAV (RNP) RWY 05 missed approach track with level indications. G755 being the hatched area at the top of the diagram.

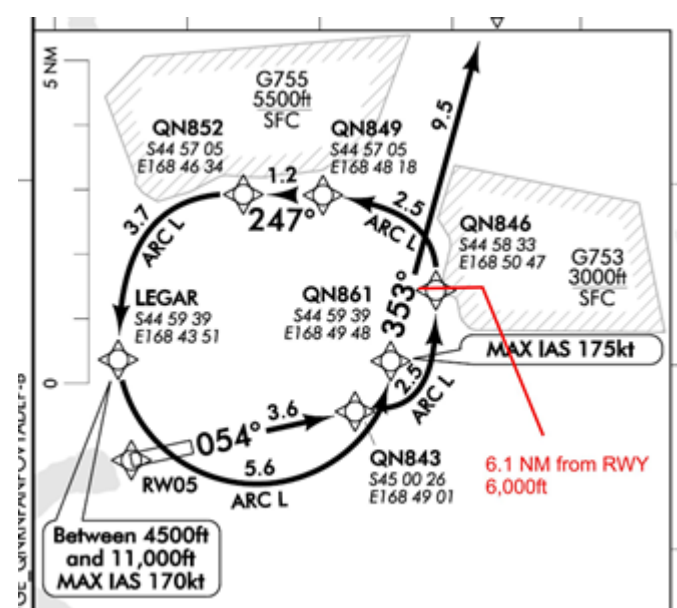


Figure 8 - RNAV (RNP) ANPOV 1A departure with level indication.

Information from Virgin Australia, QANTAS and Jetstar is in agreement with and supports the Air New Zealand information that the airlines jets will be above G755 by the point nearest to G755.

Airways has also collected some Skyline information regarding climbing above G755. This information supports the Air New Zealand information that jets flying those procedures are at least 500ft above G755 before reaching the G755 boundary. The supporting information from airlines and Airways Skyline is given below.

In the AIPNZ, each of the procedures includes depiction of G755 along with a statement relating to the operation of G755.

Airways is not aware of any rule that requires ATC to provide separation between IFR flights and GAA that are active by day.

Based on the airline and Airways information that jets climb to be above G755, along with the AIPNZ information about G755, Airways position is that G755 should remain unchanged from its present dimensions and activation by Day and that no new separation criteria need be applied in regards to G755. This position is subject to airlines accepting climb requirements inserted into the instrument procedures to ensure the jets climb above G755.

In the event that CAA change the activation of G755 to Active by Approval of ATC, Airways will need to consider the reasons for the change and take any necessary actions to address those reasons.

Supporting information from airlines and Airways Skyline is below.

a. Malcolm Taylor, Air New Zealand A320

Runway 05 missed approach.

- The missed approach track is a wider turn than the 05 departure track and the point of concern is the corner of GAA755 (Coronet Peak).
- The top of the GAA is 5500ft so we would need to cross QN553 at 6000ft.
- I calculate the track miles to QN553 as 7.4nm from RW05 waypoint.
- If DA RNAV Y 05 is 1560ft less 50ft for GA = 1510. Height gain 4490ft over 7.4nm = 10% gradient.

Malcolm McAllister has run some numbers (see below). In essence, at Flap 3, 78.0 tonnes, ISA +20 deg C, nil wind, 160kt CAS, climbing from 1170 to 6000 the A320 can maintain a climb gradient of 7.32 degrees. I haven't done the maths, but I think that is comfortably above 12%, and it would be a rare day that we are at 75.0 T, certainly not on a missed approach.

Data from the above ANZ sheet (blue highlight) would indicate that 6000ft would be reached at 6 NM. This is well inside the calculated distance to the GAA of 7.4 NM.

b. Andy Tasker, Virgin Australia

In response to the questions.

1. Can you confirm that under normal two engine operations that you will be above (500ft above the top of the GAA level) G753 (at the crown terrace) and G755 (Coronet Peak) on the 05 ANPOV and IPNOR departures.
2. Can you confirm that under normal two engine operations that you will be above (500ft above the top of the GAA level) G755 (Coronet Peak) on the RWY 05 missed approach.

Hi Clayton,

Sorry to take so long. We can comply with the stated requirements in all of your questions however the G755 6000A will require us to modify our thrust reduction altitude which in the wider scheme of things could simplify procedures for us anyway.

Regards Andy

c. Glenn Hillman, Qantas

Missed Approach Performance for Rwy 05 approaches to demonstrate vertical separation from paragliding activities in 'GAA' G755 (SFC – 5500ft).

The requirement to reach 6000ft AMSL by QN553 represents an approximate climb gradient of 11.8% (from the worst case scenario – the RNP 0.10 minima).

$$[(6000' - 1430') / (6.4\text{NM} \times 6076')] \times 100 = 11.8\%$$

Performance Engineering advise: the aircraft is capable of achieving a missed approach climb gradient of at least 14.0%.

At Waypoint QN849 (G755) - 6700ft AMSL

d. Nick Findlay, Jetstar

In response to the questions.

1. Can you confirm that under normal two engine operations that you will be above (500ft above the top of the GAA level) G753 (at the crown terrace) and G755 (Coronet Peak) on the 05 ANPOV and IPNOR departures.
2. Can you confirm that under normal two engine operations that you will be above (500ft above the top of the GAA level) G755 (Coronet Peak) on the RWY 05 missed approach.

Yes to both Clayton.

Cheers,

Nick

e. Airways

Normal Jet departures off RWY 05, photos from Skyline display. Airways has further such evidence available if wanted.



Figure 9 - Photo of Skyline information showing the level of Jetstar220 on departure. The yellow datablock JST220 has the mode C altitude information – first figures on second line (A045).



Figure 10 - Photo of Skyline information showing the level of Jetstar220 on departure. The yellow datablock JST220 has the mode C altitude information – first figures on second line (A069).

5 NZG753 Crown Terrace

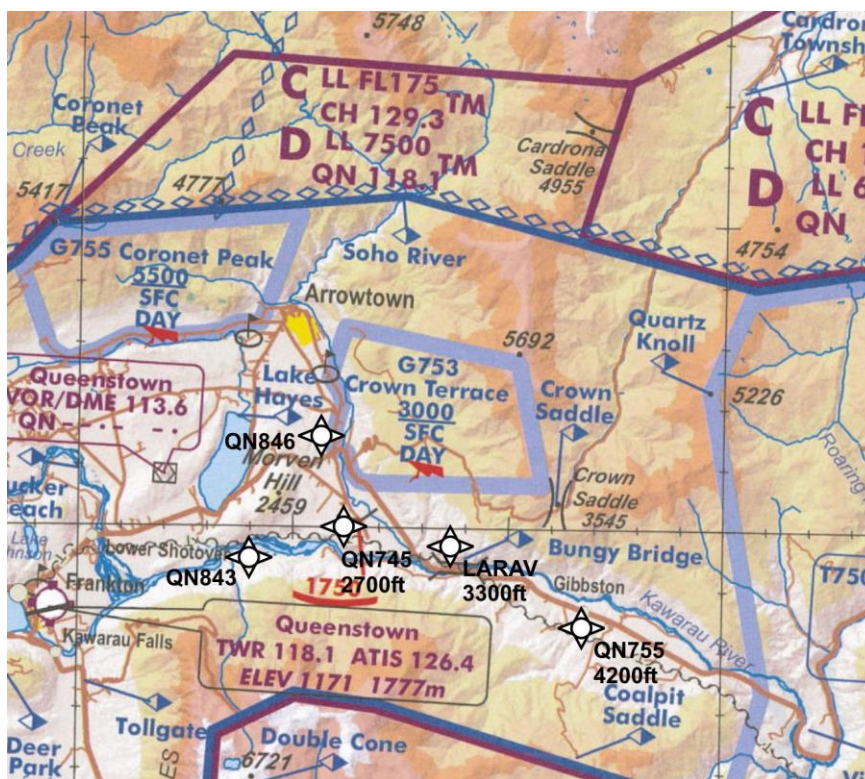


Figure 11 - VNC depicting G753 Crown Terrace with significant reporting points from RNAV (RNP) Y RWY 23 approach and ANPOV/IPNOR departures marked.

NZG753 Crown Terrace is a GAA SFC to 3000ft Active by Day. Being active by Day, it is active all day every day without reference to ATC and ATC has no authority regarding activation of the area.

In the AIPNZ, each of the IFR procedures includes depiction of G753 along with a statement relating to the operation of G753.

Regarding IFR departure procedures, the RNAV (RNP) ANPOV1A and IPNOR1A departures pass close to G753. Air New Zealand jets has advised that 4000ft would be reached at 3.4 NM. This is well inside the first way point of the departure QN843 which is at 3.6 NM. This is 2.5 NM from the closest point of G753 at QN846. QANTAS advised that their jets would be at 4600 ft at QN846. Other airlines information also agrees that their jets would be climbing above G753. Skyline information supports this - refer *Figures 9 and 10*.

All the remaining IFR departure procedures off runway 05 pass close to G753 during the visual segment of the departure. Advice from CAA is that during visual manoeuvring it is the pilot's responsibility for containment on these visual manoeuvres so see no issue here.

Regarding IFR instrument approaches, with one exception, the existing IFR approach paths pass G753 at least 500ft above the upper limit. The exception is the RNAV (RNP) Y RWY 23 approach which passes less than 1 NM from G753 whilst being less than 500ft vertically above. At point QN745, the approach profile is 2700ft, 300ft lower than the upper limit of G753.

Discussions between Airways and the regular operators (mainly paragliding) has revealed that the majority of paragliding operations in G753, including a launch and landing site, take place in the south-western corner of G753. Any moving of the southern boundary further away from the final approach track of the RNAV (RNP) Y RWY 23 approach would have a severe impact on paragliding operations – if not stopping them completely. Likewise, any reduction in the upper limit of G753 would have a severe impact of the paragliding operations – if not stopping them completely. Airways believes that moving launch and landing sites further north away from the G753 boundary and limiting the upper level of flights near the southern boundary would help to increase the gap between G753 and the RNAV (RNP) Y RWY 23 approach.

Airways is not aware of any rule that requires ATC to provide separation between IFR flights and GAA that are active by day.

Should CAA determine that a formal separation needs to be in place, Airways sees no method of applying a formal, existing separation between G753 and the RNAV (RNP) Y RWY 23 approach.

To examine some possible courses of action to address a need for some form of separation/segregation;

- Change G753 so that it can be closed whenever the RNAV (RNP) Y RWY 23 approach is to be flown. There would be logistical issues with doing this – it would be difficult to establish reliable comms with all paragliders for one. Also, Airways believe that the resulting start-stop nature of activation would be a significant issue to the operators.
- Raise the profile of the RNAV (RNP) Y RWY 23 approach so that it crosses QN745 at 3500ft or above. Or perhaps crossing QN745 at 3000ft, level with the top of G753 would be acceptable? Airways expects that there would be significant opposition from airlines about any such move to raise the profile of the approach.
- Manage the GAA in a similar fashion to G756 Skyline. That is;
 - make the GAA Active by ATC Approval, thus there is some control over who can operate in the GAA – although Airways believes there would be issues with this; and
 - establish an MOU with the operators approved to be in the GAA. Primary purposes of the MOU being to highlight to paraglider pilots the situation and to provide an acceptable level of confidence that the paragliding operations will be contained within the boundaries.

In the event that CAA change the activation of G753 to Active by Approval of ATC, Airways will need to consider the reasons for the change and take any necessary actions to address those reasons.

6 NZG756 Skyline



Figure 12 - VNC depicting G756 Skyline.

NZG756 Skyline is a GAA SFC to 4500ft Active by Approval of ATC.

The operation of G756 was carefully considered around the time of the introduction of new RNAV (RNP) instrument procedures in November 2012. The result of these deliberations was that operations (predominantly paragliding by a commercial operator) could be continued in G756 provided G756 became active by approval of ATC and operations within G756 were in accordance with an MOU between operators and ATC.

G756 did become active by approval of ATC and an MOU between operators and ATC (Airways) was established. This method of operation was accepted by CAA.

G756 is depicted on instrument charts in the AIPNZ along with a statement relating to the operation of G756.

This arrangement has worked safely and effectively since introduction in November 2012. Airways is not aware of any issues or safety events regarding G756 operations since the arrangement has been in place.

The Airways position is that under Class C, subject to CAA acceptance, the operation of G756 nearby to the instrument flight procedures would remain unchanged from the existing arrangement – that is;

1. active by approval of ATC; and
2. subject to the existing requirements specified in the MOU between Airways and the operators.

7 Wanaka Parachuting

The commercial parachuting operation at Wanaka is currently contained within a defined parachuting area to the northeast of Wanaka aerodrome (NZWF). These operations routinely go up to FL170.

The parachuting area lies between;

- the instrument arrival track to Queenstown via ELRUV and EKVOX (e.g. ELRUV2B arrival); and
- the instrument departure track from Queenstown via ANPOV/EPDEX and TIMJO (e.g. ANPOV1A dep).

Assessment by Airways instrument procedures designers (ADD) is that the existing parachuting area is not laterally separated from the arrival and departure tracks mentioned above, nor the holding pattern at EKVOX.

It appears that if the boundaries of the parachuting area were to be at least 4 NM away from the instrument track then lateral separation would exist. However, it also appears that no lateral separation would be possible from the EKVOX holding pattern.

Airways has discussed this with the parachute operator and the proposed method operation of Wanaka parachuting is to establish 3 new parachuting areas with boundaries that would be laterally separated from either the arrival track, the departure track or both the arrival and the departure tracks. See *Figure 13*.

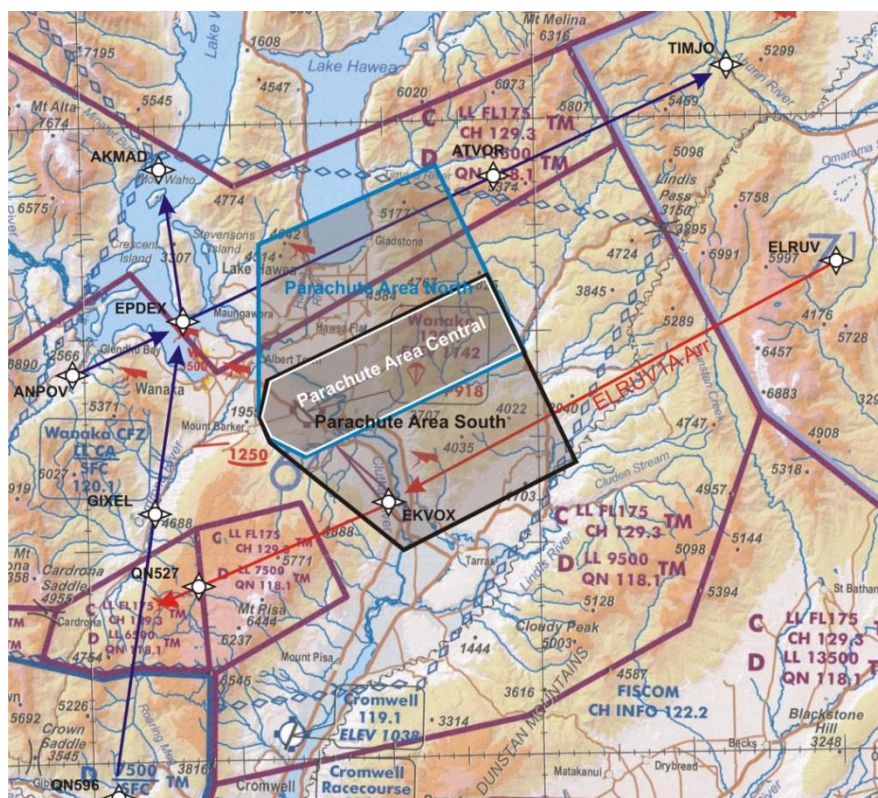


Figure 13 - Proposed new Wanaka parachute areas.

Parachute Area North would be laterally separated from the arrival track through ELRUV-EKVOX so can be used when there are only arrivals.

Parachute Area South would be laterally separated from the departure track through EPDEX – ATVOR so can be used when there are only departures.

Parachute Area Central would be the narrow overlapping area that is laterally separated from both the departure tracks and the arrival tracks so can be used when there are both arrivals and departures.

It is stressed here that the actual boundaries of these 3 proposed parachuting areas are yet to be confirmed by ADD as being laterally separated from the arrival/departure tracks - some variation from that depicted in the diagram is possible.

Vertical or visual separation would need to be applied between parachute operations and the EKVOX holding pattern.

In the event that Queenstown airspace is to be changed to Class C, Airways would initiate a review of lateral separation criteria with a view to having the lateral separation buffers reduced by some degree. Such a review would take into account that these parachute areas will only be used by professional pilots flying GNSS equipped aircraft. It is hoped that with smaller lateral separation buffers the areas can be enlarged by some degree.

In the event that no practical and useable parachute area can be established that would be laterally separated from the arrival or departure tracks then ATC would probably be limited to applying vertical separation, or visual separation where this is possible, between the parachute operation and arriving/departing IFR flights.

8 Glenorchy Parachuting

The commercial parachuting operation at Glenorchy is currently contained within a defined parachuting area to the north, east and west of Glenorchy aerodrome (NZGY). These operations routinely go up to FL170.

The lower limit of controlled airspace in this area is 13,500ft.

Assessment by Airways instrument procedures designers (ADD) is that the existing parachuting area within controlled airspace (above 13,500ft) is not laterally separated from the arrival track UBDAM – LADIP - AVGER. The SUNGU1A arrival is also not laterally separated from the area nor is the holding pattern at UBDAM.

It appears that if the boundaries of the parachuting area were to be at least 4 NM (may need a bit more than 4 NM in some parts) away from the instrument track then lateral separation would exist. However, it appears that no lateral separation from the UBDAM holding pattern is currently possible.

Airways has discussed this with the parachute operator and the proposed method operation of Glenorchy parachuting is to amend the boundaries of the parachute area so that it would be laterally separated from the IFR tracks. See *Figure 14* below.

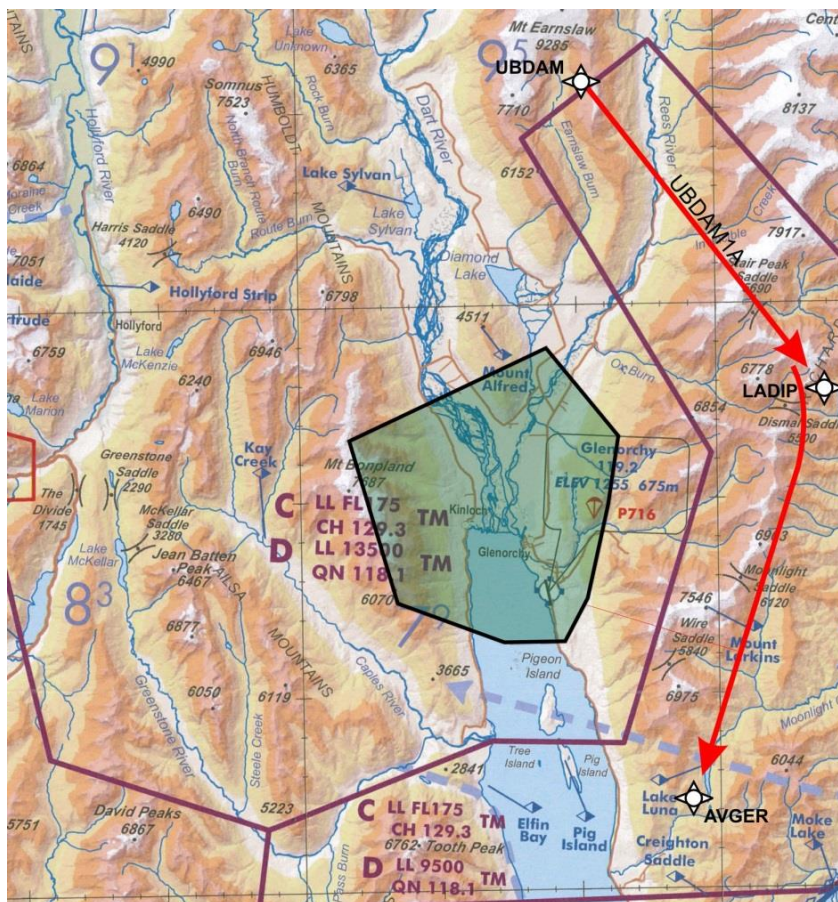


Figure 14 - Glenorchy parachuting area.

It is stressed here that the actual boundaries of this amended parachuting area are yet to be confirmed by ADD as being laterally separated from the arrival track (some variation from that depicted in the diagram is possible).

Vertical or visual separation would need to be applied between parachute operations and the UBDAM holding pattern.

In the event that Queenstown airspace is to be changed to Class C, Airways would initiate a review of lateral separation criteria with a view to having the lateral separation buffers reduced by some degree. Such a review would take into account that these parachute areas will only be used by professional pilots flying GNSS equipped aircraft. It is hoped that with smaller lateral separation buffers the areas can be enlarged by some degree.

In the event that no practical and useable parachute area can be established that would be laterally separated from the arrival track then ATC would probably be limited to applying vertical separation, or visual separation where this is possible, between the parachute operation and arriving IFR flights.

9 Jardines Parachuting

Parachute aircraft climbs

The intention is for most of the parachute aircraft to climb in a revised Cecil Peak area to the west of the southern arm of Lake Wakatipu when runway 23 is in use.

With a requirement in place for IFR departures off runway 23 to be 2700ft or above by 2.26 NM /abeam Kelvin Heights, the parachute aircraft will be instructed to maintain 2200 ft or below as it crosses from the airfield at Jardines to the western side of the southern arm remaining south of Hidden Island.

This same principal is suggested for a proposed climb area south of Jardines for separation against the figure eight or circling departures.

Once it is established in an area that is geographically separated from the IFR departure and missed approach tracks the aircraft will be able to climb above 2200ft. It is anticipated that often an earlier climb will be possible once vertical or visual separation is in place.

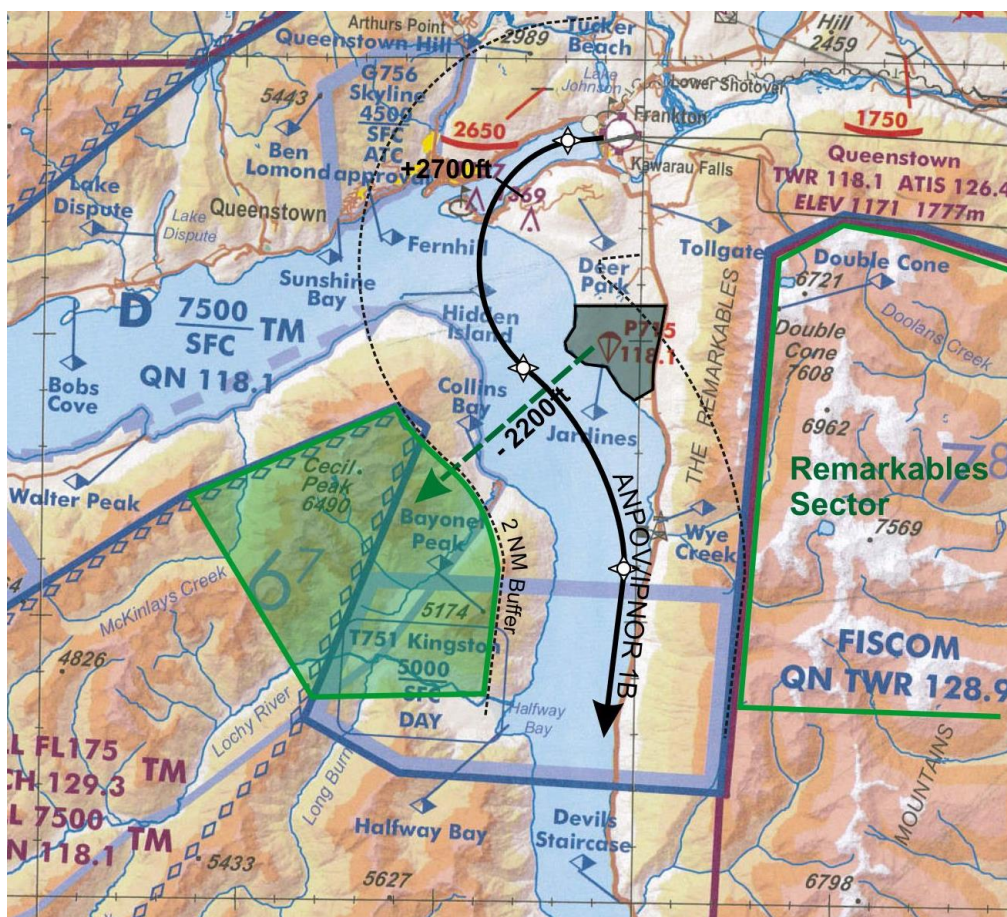


Figure 15 - Jardines parachuting areas.

At Queenstown, geographical separation is only possible up to 11,000 ft. Above 11,000 ft the climb area will need to be laterally separated from the departure and missed approach tracks. The lateral separation buffer is generally greater than that for geographical separation so above 11,000 ft the climb area will need to be further away from the IFR tracks. In the event that Queenstown airspace is to be changed to Class C, Airways would initiate a review of lateral separation criteria with a view to having the lateral separation buffers reduced by some degree. Such a review would take into account that this parachute area will only be used by professional pilots flying GNSS equipped aircraft. It is hoped that with smaller lateral separation buffers the area can be enlarged by some degree.

Once vertical or visual separation is in place the parachute aircraft can leave the climb area and return to overhead Jardines for the parachute drop. In discussions with Nzone, the parachute operator, they expressed a desire for some additional vertical restrictions to be placed in some of the IFR procedures to assist with the quicker application of vertical separation.

A revised Remarkables sector to the east of Jardines would be available for when conditions suit and to separate from runway 05 IFR departures. This sector would be in uncontrolled airspace until above 13,500ft. When using this area, the parachute aircraft would be held vertically underneath the IFR aircraft until established in the Remarkables Sector.

Parachute descents at Jardines

Airways already has in place separation requirements applicable to parachute drops and IFR procedures at Queenstown. A copy these separation requirements is given in Appendix 1.

The Airways position is that these existing separation requirements are acceptable for the provision of separation between the specified IFR flights and descending parachutists in the event that QN airspace is classified Class C.

Parachute aircraft descents

Where the parachute aircraft rapidly descends with the parachutists, then the existing separation requirements given in Appendix 1 would be applied.

Where the parachute aircraft does not descend with the parachutists (e.g. repositions for another drop), then vertical, lateral or visual separation would be applied in respect of IFR flights.

10 Figure of Eight Airline Traffic Circuit.

Due to the requirement of the GNSS aircraft to manoeuvre to set heading and to land off the RNAV GNSS there are no plans at this stage to disestablish the existing Queenstown Figure 8 circuit pattern as published in AIPNZ NZQN AD 2 – 51.3

However, with the amendments to the VFR South Arrival in place as described in section 2.1 the Figure 8 procedure could be amended to delete the requirements relating to being above or below 2700 ft – i.e. the IFR aircraft could climb to 4000 ft in the figure 8 pattern at any time.

To provide for separation between IFR flights in the Figure 8 pattern and VFR flights in the control zone, it may be necessary to develop a sector within which the Figure 8 pattern is to be confined along with other sectors for the VFR flights that are geographically separated from the Figure 8 sector.

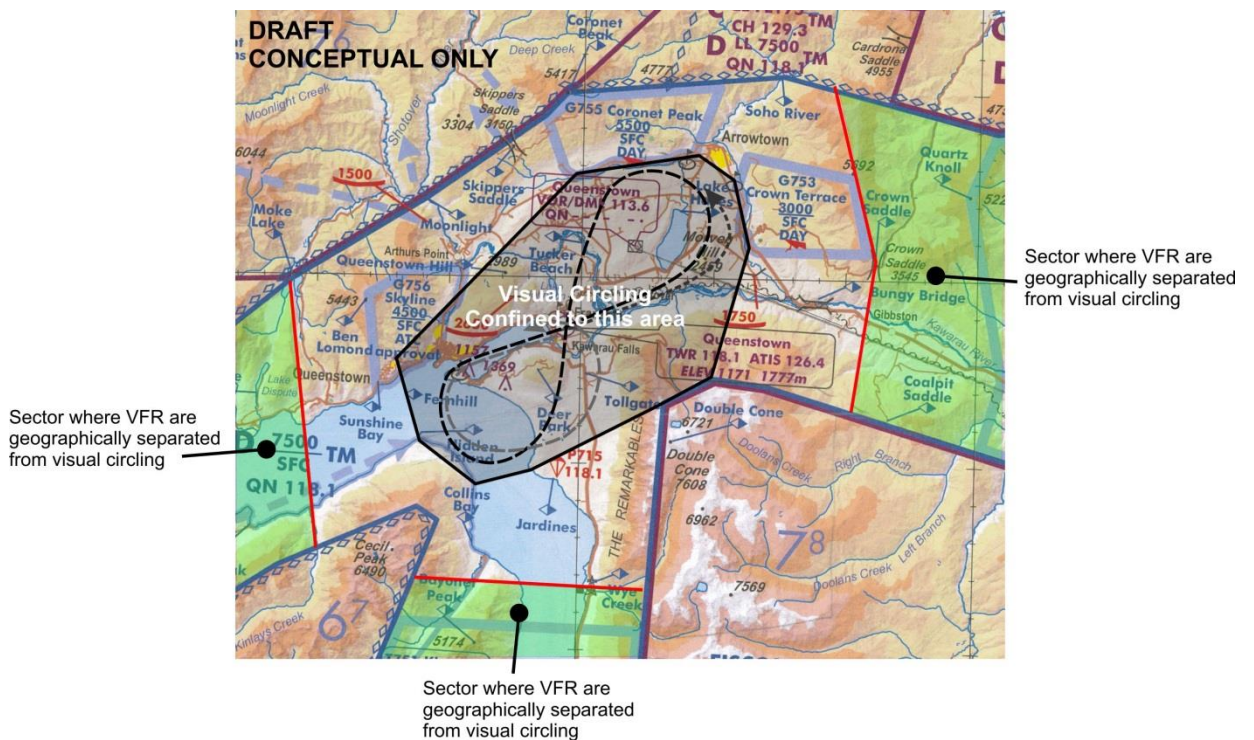


Figure 16 - Possible geographical separations from visual circling.

In time, Airways would like to review the RNAV GNSS IFR procedures with a view to reducing the area needed for visual manoeuvring (including the Figure 8 pattern) associated with the procedures.

11 Other Proposed Changes to VFR Procedures

1. Possible Devils Staircase VFR arrival procedure may be needed.
2. Maximum altitude areas below the approaches to developed to provide for the application of vertical separation underneath the approach.

12 Upper Airspace Changes

Should the Queenstown control areas (CTA) classification change to Class C then a form of separation will need to be in place between controlled VFR flights and IFR flights.

Airways information is that, within existing Queenstown control areas (CTA), the vast majority of VFR operations above 10,000 ft take place to the northeast of Queenstown in the Dunstan area.

If the classification of this airspace becomes Class C then the CTA in the Dunstan area would be controlled by Christchurch Area Radar Control who would be able to apply radar separation where possible. Refer *Figure 17* next page.

For the CTA that remains under Queenstown Approach Control (QN Tower), application of vertical separation would be the primary means of separating controlled VFR flights from IFR flights. Visual separation would also be available where aircraft have each other in sight. Lateral separations may also be able to be established that could be applied but Airways would need some time to investigate and develop these.

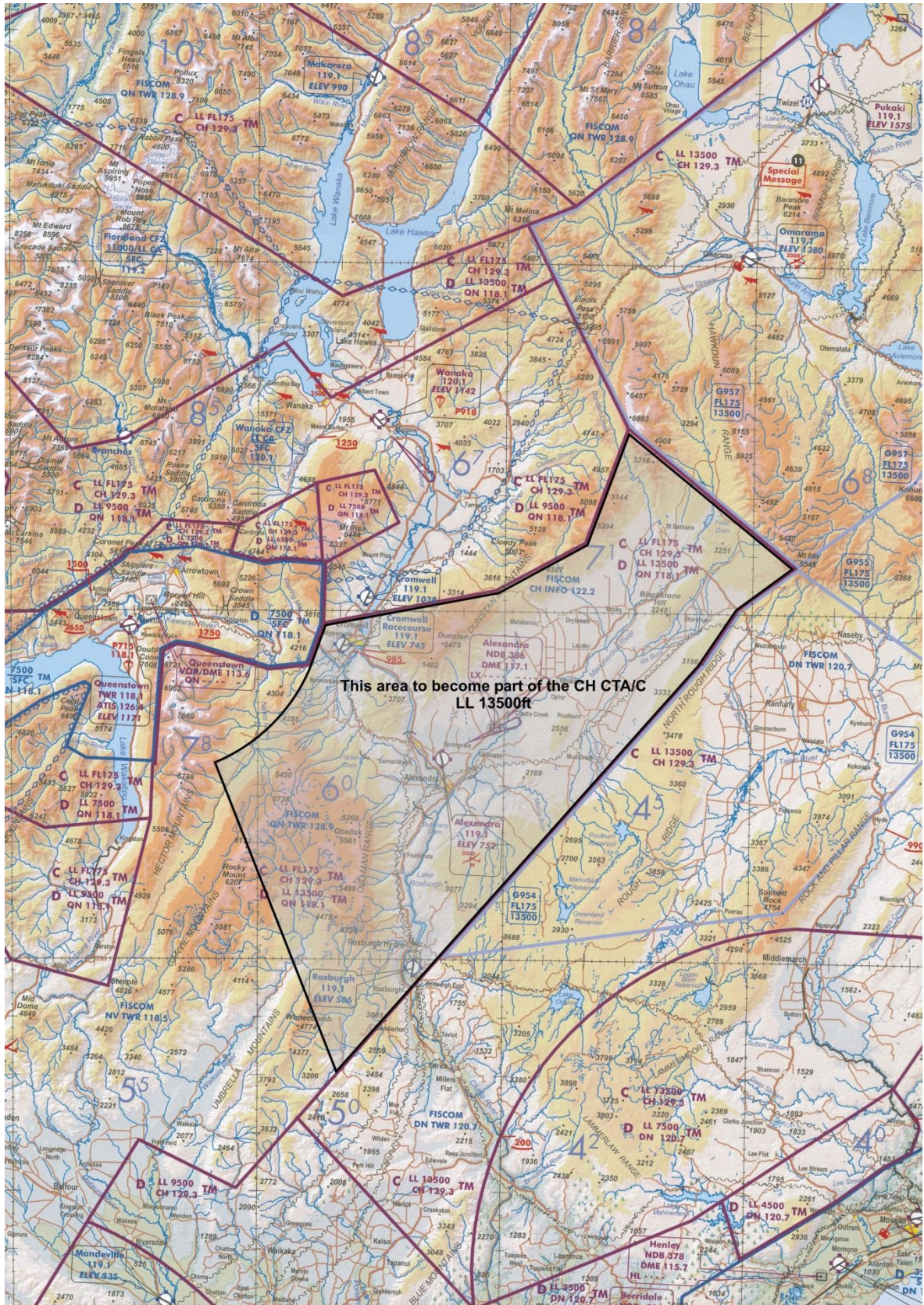


Figure 17 - Proposed airspace change in the Dunstan area to Christchurch Area Control.

Appendix 1 Existing Separation Requirements for Parachuting at Jardines

Memorandum

To: Clayton Lightfoot, Chief Controller, Queenstown Tower
All Queenstown Air Traffic Controllers

From: Mark Stretch, Head of Policy, Standards and Safety Improvement

Date: 14 November 2013

Subject: **Separation Requirements for Parachute Operations at Jardines**

This Memorandum replaces the Memorandum on the same subject dated 20 March 2013. Changes are addition of new/amended SUNGU SIDs, new requirement regarding procedures not referred to by this Memorandum and editorial.

QN ATC shall apply the separation requirements specified in this Memorandum between IFR flights and parachuting within the Jardines PDA and PDS.

This separation requirement over-rides the existing MATS RAC 3-58 s3.6.2 1st bullet point which shall no longer be applied by QN ATC in regard to the Jardines PDA and PDS.

Where a current Queenstown STAR, SID or approach is not referred to in this Memorandum, QN ATC shall ascertain what separation requirements shall be applied regarding the STAR, SID or approach from the Head of Policy, Standards and Safety Improvement.

Separation Requirements for Parachute Operations at Jardines

Unless vertical separation is in place, the following separation requirements shall be applied between the Jardines PDA/PDS and IFR flights flying the following procedures.

Except when 'visual drop behind' is used, where the separation requires that the aircraft "has passed and is moving away from the PDA and PDS" the controller shall establish this before issuing the drop clearance;

- by visual observation by ATC, or
- from information read from a surveillance screen; or
- from a report from the departing IFR flight that it has passed a reporting point that complies with "has passed and is moving away from the PDA and PDA".

'Visual drop behind' by the parachute aircraft can be used provided the following conditions are met;

- the departing IFR flight concerned has been cleared for take off; and
- the parachute aircraft has reported the IFR flight concerned in sight and can maintain visual separation; and
- if the IFR flight concerned is doing anything other than the expected departure for its type, information about the tracking of the IFR shall be given prior to issuing the 'visual drop behind' clearance.
- The phraseology for issuing the 'visual drop behind' clearance shall be "*C/S, BEHIND THE (aircraft type) CLEARED DROP BEHIND*".

Runway 23 Arrivals

All STARs to RWY 23 are separated from the PDA and PDS.

RNAV (RNP) Y RWY 23:

- The PDA and PDS shall not be active from the time an aircraft flying the published missed approach passes the MAP until the aircraft has passed and is moving away from the PDA and PDS except that;
 - a parachute drop may be permitted to commence (i.e. a "Jumpers Away" report) prior to the approaching aircraft having crossed LARAV provided;
 - the surface wind is 25 kts or less; and
 - there is no information indicating that wind shear is or may be present; and
 - the controller has reasonable assurance that the approaching aircraft will land from the approach without needing to fly the missed approach procedure for any reason including weather conditions; and
 - in the event that the approaching aircraft does carryout a missed approach, information about the parachuting, including the number of chutes, shall be passed if the PDS will still be active when the aircraft reaches Kelvin Heights.

RNAV (GNSS) G:

- A parachute drop may be permitted to commence (i.e. a "Jumpers Away" report) prior to the approaching aircraft having crossed IKABA provided;
 - the aircraft is joining for runway 23; and
 - the surface wind is 25 kts or less; and
 - there is no information indicating that wind shear is or may be present; and
 - the controller has reasonable assurance that the approaching aircraft will land from the approach without needing to fly the missed approach procedure for any reason including weather conditions; and
 - in the event that the approaching aircraft does go around and enter the figure 8 pattern, instructions shall be issued to ensure the aircraft remains clear of the PDS and information about the parachuting, including the number of chutes, shall be passed.
- For RNAV (GNSS) G Circling RWY 05, separation from the visual manoeuvring portion is applied as per the figure 8, see below.

VOR/DME B:

- A parachute drop may be permitted to commence (i.e. a "Jumpers Away" report) prior to the approaching aircraft having established inbound provided;
 - the aircraft is joining for runway 23; and
 - the surface wind is 25 kts or less; and
 - there is no information indicating that wind shear is or may be present; and
 - the controller has reasonable assurance that the approaching aircraft will land from the approach without needing to fly the missed approach procedure for any reason including weather conditions; and
 - in the event that the approaching aircraft does go around and enter the figure 8 pattern, instructions shall be issued to ensure the aircraft remains clear of the PDS and information about the parachuting, including the number of chutes, shall be passed.
- For VOR/DME B Circling RWY 05, separation from the visual manoeuvring portion is applied as per the figure 8, see below.

Visual Approach RWY 23:

- Aircraft flying a visual approach that could fly near the PDA or PDS shall be issued with instructions that ensure the aircraft's tracking will remain clear of the PDA/PDS and information about the parachuting shall be passed.

Figure-eight Pattern RWY 23:

- The PDA and PDS shall not be active whilst an aircraft is operating in the figure 8 circuit pattern until it has landed.

RWY 23 Departures

ANPOV1B Departure:

- The PDA and PDS shall not be active above 4000ft AMSL from the time the departing aircraft is cleared for take off until the aircraft has passed and is moving away from the PDA and PDS.

Confirmation that the PDS is not active above 4000ft AMSL shall be established by a pilot RTF report from the jump aircraft.

IPNOR1B Departure:

- The PDA and PDS shall not be active above 4000ft AMSL from the time the departing aircraft is cleared for take off until the aircraft has passed and is moving away from the PDA and PDS.

Confirmation that the PDS is not active above 4000ft AMSL shall be established by a pilot RTF report from the jump aircraft.

ANPOV1D Departure:

- The PDA and PDS shall not be active from the time the departing aircraft gets airborne until the aircraft has set-heading at ENKUV except that a 'visual drop behind' clearance may be issued prior to ENKUV provided;
 - the departing aircraft is above 4,600ft; and
 - reasonable assurance exists that the departing aircraft will set heading without the need to circle Deer Park a second time.

IPNOR1D Departure:

- The PDA and PDS shall not be active from the time the departing aircraft gets airborne until the aircraft has set-heading at ENKUV except that a 'visual drop behind' clearance may be issued prior to ENKUV provided;
 - the departing aircraft is above 5,300ft; and
 - reasonable assurance exists that the departing aircraft will set heading without the need to circle Deer Park a second time.

SUNGU1Q Departure:

- The PDA and PDS shall not be active from the time the departing aircraft gets airborne until the aircraft has set-heading at ENKUV except that a 'visual drop behind' clearance may be issued prior to ENKUV provided;
 - the departing aircraft is above 4,200ft; and
 - reasonable assurance exists that the departing aircraft will set heading without the need to circle Deer Park a second time.

SUNGU1S Departure:

- The PDA and PDS shall not be active from the time the departing aircraft gets airborne until the aircraft has established on the 178° track from ISLON and has passed and is moving away from the PDA and PDS.

FRANKTON 4 Departure:

- The PDA and PDS shall not be active from the time the departing aircraft gets airborne until the aircraft has passed and is moving away from the PDA and PDS and has set-heading on the QN 214 radial.
- For flights returning to the QN VOR, the PDA shall not be active until the aircraft has passed QN VOR or is vertically above the PDA.

Visual Departure RWY 23:

- Aircraft flying a visual departure that could fly near the PDS or PDA shall be issued with instructions that ensure the aircraft's tracking will remain clear of the PDA/PDS and information about the parachuting shall be passed.

RWY05 Arrivals

All STARs to RWY 05 are separated from the PDA and PDS.

RNAV (RNP) Y RWY 05:

- The PDA and PDS shall not be active from the time an aircraft flying the published missed approach crosses QN557 until the aircraft has passed and is moving away from the PDA and PDS or is vertically above the PDA/PDS.

RNAV (GNSS) F for RWY 05:

- A parachute drop may be permitted to commence (i.e. a "Jumpers Away" report) prior to the approaching aircraft having crossed IBABU provided;
 - the aircraft is joining for runway 05; and
 - the surface wind is 25 kts or less; and
 - there is no information indicating that wind shear is or may be present; and
 - the controller has reasonable assurance that the approaching aircraft will land from the approach without needing to fly the missed approach procedure for any reason including weather conditions; and
 - in the event that the approaching aircraft does go around and enter the figure 8 pattern, instructions shall be issued to ensure the aircraft remains clear of the PDS and information about the parachuting, including the number of chutes, shall be passed.

RNAV (GNSS) F for RWY 23:

- A parachute drop may be permitted to commence (i.e. a "Jumpers Away" report) prior to the approaching aircraft having crossed GUSAS provided;
 - the aircraft is joining for runway 23; and
 - the surface wind is 25 kts or less; and
 - there is no information indicating that wind shear is or may be present; and
 - the controller has reasonable assurance that the approaching aircraft will land from the approach without needing to fly the missed approach procedure for any reason including weather conditions; and
 - in the event that the approaching aircraft does go around and enter the figure 8 pattern, instructions shall be issued to ensure the aircraft remains clear of the PDS and information about the parachuting, including the number of chutes, shall be passed.

VOR/DME C:

- Separated from the PDA and PDS
- Note: separation from the visual manoeuvring portion is applied as per the figure 8, see below

Visual Approach RWY 05:

- Aircraft flying a visual approach that could fly near the PDA or PDS shall be issued with instructions that ensure the aircraft's tracking will remain clear of the PDA/PDS and information about the parachuting shall be passed.

Figure-eight Pattern RWY 05 (including visual manoeuvring from an instrument approach) :

- The PDA and PDS shall not be active whilst an aircraft is operating in the figure 8 circuit pattern until it has landed.

- ***RWY05 Departures***

ANPOV1A Departure:

- Separated from the PDA and PDS

IPNOR1A Departure:

- The PDA and PDS shall not be active from the time the departing aircraft crosses LEGAR until the aircraft has passed and is moving away from the PDA and PDS or is vertically above the PDA/PDS.

IPNOR1C Departure:

- The PDA and PDS shall not be active from the time the departing aircraft gets airborne until the aircraft has passed and is moving away from the PDA and PDS.

SUNGU1P Departure:

- The PDA and PDS shall not be active from the time the departing aircraft gets airborne until the aircraft has passed and is moving away from the PDA and PDS.

EPDEX1C Departure:

- Separated from the PDA and PDS

BRIDGE 5 Departure:

- Separated from the PDA and PDS

Visual Departure RWY 05:

- Aircraft flying a visual departure that could fly near the PDS or PDA shall be issued with instructions that ensure the aircraft's tracking will remain clear of the PDA/PDS and information about the parachuting shall be passed.



Mark Stretch
Head of Policy, Standards and Safety Improvement

