

**BEFORE THE COMMISSIONERS APPOINTED BY  
THE QUEENSTOWN LAKES DISTRICT COUNCIL**

Submitter 31021

**IN THE MATTER**

of Queenstown Lakes District  
Council Proposed District Plan  
Stage 3

**Corbridge Estate Limited  
Partnership**

**Submitter**

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**BRIEF OF EVIDENCE OF MICHAEL JAMES SMITH**

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## BRIEF OF EVIDENCE OF MICHAEL JAMES SMITH

### INTRODUCTION

1. My full name is Michael James Smith, I am an acoustic engineer residing at Christchurch, and director of Altissimo Consulting Ltd.
2. I have practised in the field of acoustics since 2006. I am a full member of Engineering New Zealand (MEngNZ), the Acoustical Society of New Zealand (MASNZ) and the Australian Acoustical Society (MAAS). I hold the degrees of Bachelor of Engineering (Mechanical) and Bachelor of Mathematical and Computer Sciences from the University of Adelaide.
3. I regularly assess the effects of major infrastructure on adjacent sensitive land uses. I have also given evidence for the both the NZ Transport Agency and Christchurch City Council supporting controls on sensitive land use near roads and airports respectively.
4. I have read the Expert Witness Code of Conduct set out in the Environment Court's Practice Note 2014 and agree to comply with it. I have complied with the Code of Conduct in preparing this evidence and I agree to comply with it while giving oral evidence before the hearing committee. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.
5. Corbridge Estate Limited Partnership is seeking their land be rezoned to Rural Visitor Zone. Alongside this Corbridge seek to include a structure plan to guide development of a Golf Course and various visitor accommodation and residential offerings within the zone. The full detail of the proposal is outlined in the evidence of others, particularly Mr Curley.
6. Acoustics is a matter that requires consideration in this case due to the fact that the Wanaka Airport Noise Control Boundary overlays a portion of the site and the site is adjacent to the state highway. Compatibility with these noise sources is required to be considered both in terms of

effects on users of the Rural Visitor Zone, and potential reverse sensitivity effects on the adjacent infrastructure.

7. I have been asked by Corbridge to provide this brief of evidence in relation to:
  - (a) Scope and effect of the noise control boundaries;
  - (b) Noise levels at the site from Wanaka Airport;
  - (c) Noise from the adjacent state highway;
  - (d) Comment on the overall compatibility of the zone and surrounding infrastructure; and
  - (e) Measures to mitigate potential noise effects.

#### **EXECUTIVE SUMMARY**

8. The potential effects of noise from Wanaka Airport and State Highway 6 on the Corbridge site have been considered. Aircraft noise will be audible when overflying the site, however not at levels that are incompatible with recreation activities.
9. The proposal ensures that noise sensitive activities are located outside of the Wanaka Airport Outer Control Boundary and the State Highway Setback.
10. Noise levels within buildings will be acceptable, and not result in sleep disturbance. I do not consider there to be a need for additional noise insulation to achieve appropriate internal noise levels.

#### **NOISE CONTROL BOUNDARIES**

11. The district plan contains a single "Outer Control Boundary" (OCB) for Wanaka Airport. Within the OCB, all "Activities Sensitive to Aircraft Noise" (ASAN) are prohibited. Visitor accommodation and residential activity is considered to be an ASAN.

12. The application of an OCB is broadly consistent with NZS 6805<sup>1</sup> and other airports around New Zealand. The purpose of the prohibition of ASANs within the OCB is two-fold: to protect people from amenity and health effects from aircraft noise; and to protect airport operators from reverse sensitivity effects.
13. The Outer Control Boundary is based on the on the predicted day/night sound levels of 55 L<sub>dn</sub> from future airport operations in 2036<sup>2</sup>. This contour is based on 74,000 commercial passengers per year, and a total of 37,500 aircraft movements. A significant number of these aircraft movements are expected to be from General Aviation.
14. To be an effective land-use control, the OCB is required to be a reasonable representation of the 'ultimate' capacity of the airport. If the contours are too small, encroachment of sensitive activities can occur. If the contours are too conservative, this can lead to inefficient use of resources. The scenario used to determine the OCB includes a larger runway and inclusion of a small number of jet aircraft movements. It is my understanding that there are not currently any jet aircraft movements at Wanaka Airport.
15. The OCB includes approximately 24 hectares of the Corbridge site, on the eastern boundary. The structure plan being proposed by Corbridge avoids locating any ASAN's within the area affected by the OCB. The area of the Corbridge site affected by the OCB is proposed to contain Golf Course and Open Space Areas.

### **CURRENT NOISE EXPOSURE FROM WANAKA AIRPORT**

16. As of 2019, there are 50,000 aircraft and helicopter movements per year from the Wanaka Airport<sup>3</sup>. A breakdown of aircraft types was requested from QAC but this was deemed commercially sensitive and

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<sup>1</sup> New Zealand Standard NZS 6805:1992

<sup>2</sup> p2.12-2.16 Report and recommendations of the hearing panel on proposed plan change 26, and the notices of requirement for designations 64 & 65 in the Queenstown Lakes District Plan

<sup>3</sup> <https://www.queenstownairport.co.nz/assets/documents/Annual-Profile-2018-2019.pdf>

not provided. Their public documents state that current movements are predominantly from Cessna, Beechcraft, Piper and smaller aircraft.

17. There are currently no scheduled commercial flights to Wanaka, since Air New Zealand stopped their services in 2013.
18. Designation 64 requires actual noise contours to be produced every two years, and submitted to the Wanaka Airport Liaison Committee. The most recent (2018) contours were provided to me by Queenstown Airport Corporation, as calculated by Marshall Day Acoustics<sup>4</sup>. A copy of this is provided in Figure 1 in Annex A to my evidence.
19. The 2018 55  $L_{dn}$  contour is largely contained within the airport boundary. On this basis, aircraft sound levels at the Corbridge site are likely to be between 45-50  $L_{dn}$  currently.
20. There are preferred approach and departure flight paths published in the Aeronautical Information Publication<sup>5</sup> for the Wanaka Airport. The only path that crosses the Corbridge site is on the extended runway centreline. Aircraft will generally join or separate from this flight path over the Clutha before leading to either the Outlet of Lake Wanaka and southwest towards the Cardrona Valley.
21. In addition to the day-night average levels, I have considered the noise levels from individual aircraft movements along the flightpath crossing the Corbridge site. When flying directly overhead at 1000 feet above ground level, the maximum sound level from a Cessna or Piper is likely to be between 55-65 dB  $L_{AFmax}$ .
22. This is a comparable sound level to a vehicle pass-by at 10 metres on a 50km/h residential street, although present for longer as it would take approximately 15-30 seconds for a plane to cross the site. Sound at this level will be clearly audible in open spaces and identifiable as an aircraft. Occasionally, people may be distracted by individual aircraft movements, but overall I consider sound from general aviation at these levels compatible with a recreation environment.

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<sup>4</sup> Marshall Day Acoustics (2019), Wanaka Airport – 2018 Noise Compliance Contours

<sup>5</sup> Civil Aviation Authority (2015). VFR Preferred Arrival/Departure Routes for RWY11 and 29.

23. As the lateral distance from the flightpath increases, aircraft sound levels will progressively reduce. For example, a lateral separation of 300 m will result in aircraft noise levels of 45-55 dB  $L_{AFmax}$ . While still audible at these levels, I consider effects beyond this distance to be minimal. I have shown this distance in Figure 1.
24. The 2018 noise modelling takes into consideration the actual aircraft movements, runway direction based on wind condition, and flightpaths to determine the 55 dB  $L_{dn}$  contour. As discussed in Paragraph 19, this contour does not cross the Corbridge site. Sound levels from individual aircraft have been estimated at different distances to supplement this modelling and put received sound levels into context.

### **NOISE FROM THE STATE HIGHWAY**

25. The site is adjacent to State Highway 6 (Wanaka Luggate Highway) which carries 5000 vehicles per day, of which 7% are heavy vehicles. The posted speed limit is 100 km/h. It is classified Arterial under the One Road Network Classification.
26. Waka Kotahi NZ Transport Agency has policies<sup>6</sup> to ensure noise-sensitive activities are sufficiently set back from roads to avoid effects on those uses, and to only allow such activities where they do not compromise the land transport network.
27. To give these policies effect, the Transport Agency seeks to have buffers around road included in district plans. The distance of these buffers is set to achieve external noise levels of 57 dB  $L_{Aeq(24h)}$ .
28. This noise level will occur at approximately 60m from the road, and only has a minor impact on the Corbridge site. The activity areas proposed by Corbridge have a considerably greater separation from the road.
29. The 57 dB  $L_{Aeq(24h)}$  level is not a 'no effects' level and generally does not provide a high level of acoustic amenity, and road-traffic noise would still be a significant part of the environment. I understand that

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<sup>6</sup> NZ Transport Agency (2015) Effects of noise sensitive land use

there will be no noise sensitive activities able to take place within this area.

30. The 55 dB  $L_{Aeq(24h)}$  contour from the road is shown in Figure 1.

### Discussion

31. When considering the effects of development adjacent infrastructure, sleep disturbance and associated health effects is generally the key concern. This is not the case for Corbridge, where there are no flights at night, and even if there were in the future, noise levels at visitor accommodation will be outside the OCB and the quality of building construction will result in internal sound levels well below sleep disturbance criteria.
32. Outdoor amenity is the primary issue for this site. Some European studies suggest 100% of visitors would perceive acoustic environment as excellent when the daytime level ( $L_{day}$ ) is 45 dB, with this decreasing to 50% at 55 dB<sup>7</sup>. As discussed in paragraphs 19 and 30, both aircraft and road-traffic noise levels are expected to be between 45 and 55 dB<sup>8</sup>.
33. People's sensitivity to noise will vary depending on whether they are undertaking active or passive recreation. People's experience of "quiet" and tranquillity is not solely related to sound levels, but also depends on other area qualities such as landscape and air quality, and the expectations of the visitors.

### Measures to mitigate noise effects

34. The primary control in the Corbridge site will be to locate the majority of the accommodation and other buildings away from published flightpaths, outside of the OCB, and the state highway setback.
35. In some cases where buildings are near airports, it can be necessary to reduce internal sound levels by keeping windows closed and using

<sup>7</sup> European Environment Agency (2014) Good practice guide on quiet areas, Table 3.2

<sup>8</sup> Given there are no night flights, the 55 dB  $L_{dn}$  contour is equivalent to 55 dB  $L_{Aeq(24h)}$

mechanical ventilation for fresh air. However, in this case, internal sound levels with doors and windows open are expected to result in comfortable levels given the level of noise that is likely to be experienced at the site from the various noise sources. Therefore I do not think it is necessary to adopt these measures in this case.

**Michael Smith**

**Altissimo Consulting**

Date: 28 May 2020



## ANNEX 1

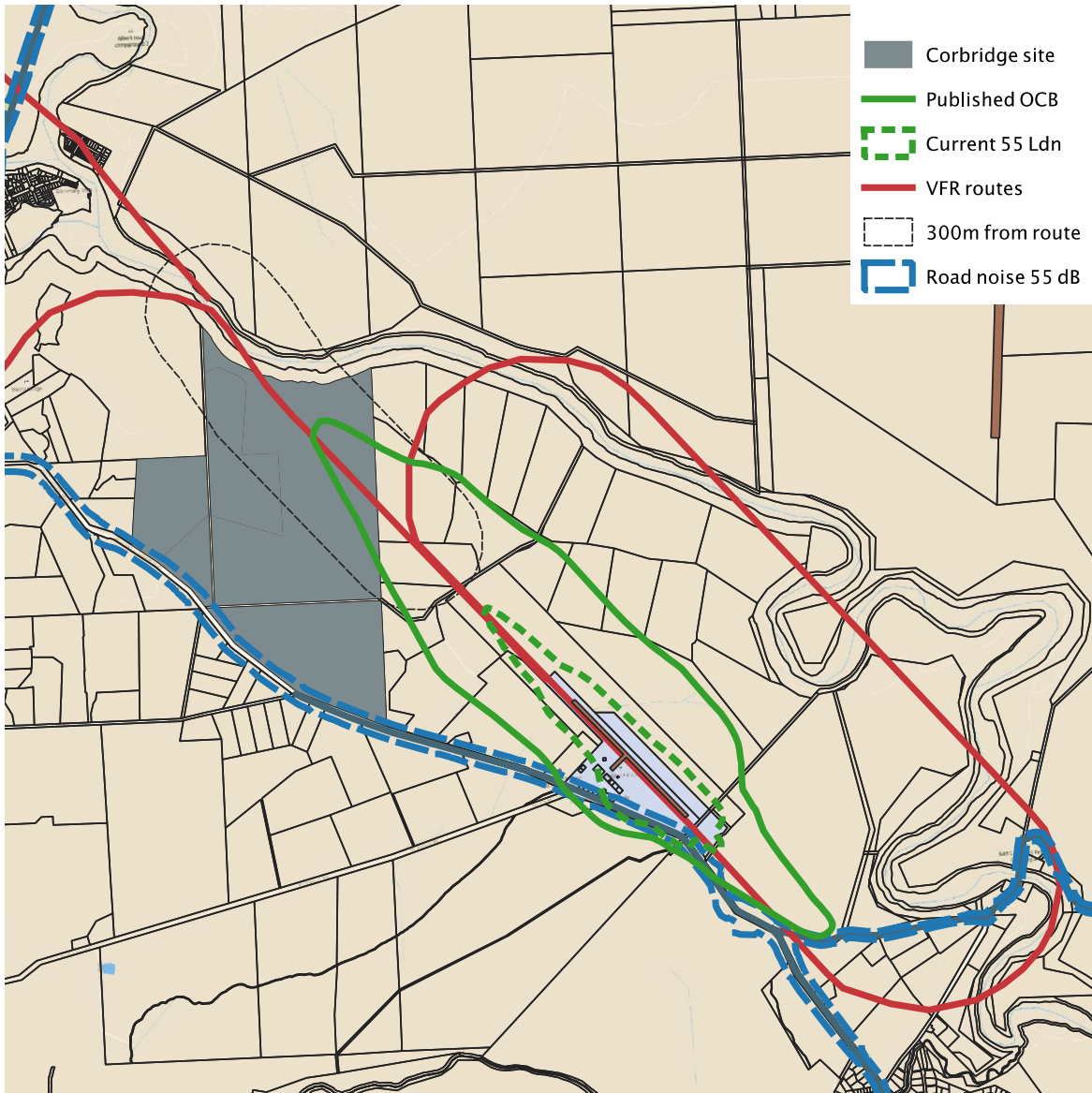


Figure 1: Aircraft noise contours and flightpaths