

Under **Fast-track Approvals Act 2024**

In the matter of an application for approvals in relation to the Ryans Road Industrial Development

By **Carter Group Limited**
Applicant

Supplementary statement of evidence of Simon McPherson (Safeguarding Officer, Cyrrus Limited)

17 February 2026

Submitter's solicitors:

J M Appleyard | M E Davidson

Anderson Lloyd

Floor 2, The Regent Building, 33 Cathedral Square, Christchurch 8011

PO Box 13831, Armagh, Christchurch 8141

DX Box WX10009

p + 64 3 379 0037

jo.appleyard@al.nz | meg.davidson@al.nz

Supplementary statement of Simon McPherson (Safeguarding Officer, Cyrrus Limited)

Introduction

- 1 My name is Simon McPherson.
- 2 I am a Safeguarding Officer at Cyrrus Limited, a specialist aviation consultancy based in Thirsk, North Yorkshire. I graduated in 1989 with a BEng in Electrical Engineering and since then have worked in the aviation sector, including 20 years' experience as a flight inspector of airport and en route air navigation equipment both in the UK and across Europe, Africa and the Middle East. At Cyrrus I am responsible for all aspects of aviation safeguarding, from studying the effects of proposed developments on an airport's operation to assessing the impact of wind farms on radar.
- 3 I have some prior familiarity with operations at Christchurch International Airport, having completed an earlier technical assessment for the airport.
- 4 I was involved in the preparation of the **Technical Safeguarding Assessment of Air Navigation** for the **Ryans Road Industrial Development**, which was submitted as part of the Applicant's response to submissions on the application (Appendix 18).

Code of practice for expert witnesses

- 5 I have prepared this statement of evidence in my capacity as an expert, and I acknowledge that I have read and understand the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. I have complied with it when preparing this statement of evidence. I have also complied with it when preparing the assessment described at paragraph 3 above. Other than where I state that I am relying on the evidence of another person, my 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 that I express.

Purpose and scope of this supplementary evidence

- 6 I have been asked by the Applicant to prepare this supplementary statement of evidence in response to the supplementary submission of Airways New Zealand dated 18 December 2025.
- 7 This supplementary statement is confined to matters within my area of expertise and addresses those aspects of the Airways New Zealand

supplementary submission that relate to air navigation safeguarding and aviation safety effects. Specifically, this supplementary statement addresses the following matters raised by Airways, including:

- (a) The appropriateness and adequacy of the aviation safeguarding assessments prepared in support of the application, including the methodology adopted and the conclusions reached;
- (b) Comments and critiques raised by Airways New Zealand in relation to aviation safety effects, including but not limited to:
 - (i) non-cumulative effects bias in the assessment;
 - (ii) reliance on a "2° Building Rotation" mitigation;
 - (iii) Instrument Landing System (ILS) glidepath disturbances;
 - (iv) Distance Measuring Equipment (DME) loss of information / reliance on "velocity memory"; and
 - (v) Radar impacts.
- (c) My overall conclusion as to the acceptability of the aviation safety effects of the proposal, taking into account the assessment work undertaken and the matters raised by Airways.

Appropriateness and Adequacy of the Air Safeguarding Assessments provided by the Applicant

- 8 Cyrrus is a recognised expert in the aviation safeguarding field and has completed numerous similar assessments for other large international airports. The modelling methodologies used by Cyrrus for assessing impacts on air navigation systems are recognised as industry best-practice.
- 9 In accordance with standard modelling methodology, the development has been modelled assuming the maximum allowable heights and numbers of buildings and the ILS modelling has made worst-case assumptions with regards to the reflectivity of the development surfaces in order to maximise potential adverse effects.
- 10 Where appropriate, the surrounding area has been taken into account, for example when modelling DME and DVOR line of sight coverage. The ILS modelling assesses the development in isolation but then combines the modelled interference with the existing interference as measured by flight inspection (as provided by Airways NZ) to assess the overall potential impact.

- 11 Rotating proposed buildings to reduce their impact is a widely accepted and effective mitigation that can be implemented at the development design stage.

Non-cumulative effects bias

- 12 The desk-based assessment is focussed on the proposed development parameters. It is unreasonable, unrealistic and beyond scope to expect an assessment of “all cumulative and foreseeable developments in the wider precinct”.
- 13 We note that the maximum envelope of the development has been modelled, meaning changes within this envelope and the proposed conditions governing the development will have acceptable effects. Conversely, any changes or development beyond those modelled parameters would require further modelling and assessment. Beyond the project site, development outcomes are unknown and speculative and can be expected to require their own assessment and modelling at the time they are proposed.

2° Building Rotation

- 14 Changing the orientation of proposed buildings is a standard building design mitigation for reducing the impact of signal reflections causing multipath interference.
- 15 The assessment assumes the building material is a perfect signal reflector to maximise any potential interference effects. The final building material specifications are unlikely to simply comprise completely smooth metallic surfaces: surface discontinuities will help to scatter reflections and so reduce the magnitude of the interference predicted by the worst-case modelling.
- 16 The proposed development site actually lies outside the EUR 015 glidepath building restricted area; however, I have identified potential impacts through modelling using a specialist ILS modelling software tool and have used the same software to propose mitigation by making adjustments to the development design. This is standard industry practice for developments near an airport.
- 17 I stand by the modelling of the proposed development as detailed in the plans provided by the client. The Cyrrus report shows that various building changes were explored and that the 2-degree orientation change is an effective way to reduce the impact on the glidepath signal to an acceptable level.

- 18 Further study of the development as it is built out is not an unreasonable requirement, if it deviates from the particulars upon which our modelling is based. We understand that conditions of consent will require this.

ILS Glidepath Disturbances

- 19 The terrain between the glidepath antenna and the development is largely flat. The modelling has assumed that the glidepath has full visibility of the proposed development as a worst-case scenario. The assessment shows how the glidepath “scalping” can be reduced to a minor and acceptable level by making changes to the design of the development (2° building rotation).
- 20 The Cyrrus report does not propose degrading the ILS status from Cat 3 to Cat 1. The possibility of downgrading an ILS facility performance category is merely mentioned in the report as an example of a last resort mitigation to be considered in the technical safeguarding process when all other mitigation measures fail to safeguard the ILS performance (which is not considered likely) and is certainly not proposed or relied on as a mitigation measure for this development.

DME Loss of information

- 21 This refers to the DME associated with the DVOR. The Cyrrus report further states that aircraft are more likely to fly above the reflections, and that pilots of approaching aircraft will not be relying on DME range information in the affected area.
- 22 Aircraft flying the VOR/DME approach to runway 02 will be using the DME until just before the missed approach point which is overhead the VOR/DME and within the navaid “cone of confusion” where the DME will be showing slant range rather than ground distance. At this point, if the weather and visibility are suitable, pilots will fly a visual approach to land and will not be using DME information. If the visibility is too poor then pilots will fly a go-around procedure climbing to 4,000ft on the runway heading. In either case, pilots will not be relying on any DME information between the VOR/DME overhead and the runway 02 threshold, which is where the potential multipath may occur. In summary, DME reflections will not have any impact on approaching aircraft.

Radar Impacts

- 23 The newly installed Indra PSR is state-of-the-art equipment that, according to its marketing brochure, can “safely monitor all the aircraft in the covered

airspace while simultaneously mitigating interference, obstacles and undesired effects in any environmental conditions.”¹

- 24 It is a standard feature of modern SSR radars that they can adapt to the built environment by maintaining and updating an internal reflector file in order to discount reflections from identified fixed ground obstacles.
- 25 It is understood that there are trade-offs when radar configurations are changed, but radars are often located in the vicinity of buildings, particularly at airports where there may be large hangars and terminal buildings. All radars have in-built mitigation tools available that can be utilised without unduly compromising radar performance.
- 26 Lifting the beams is not suggested as a mitigation in the Cyrrus assessment. The radar mitigations mentioned, if required, are standard measures that would not “severely compromise radar performance”. Any reflections from building roofs will be at shallow angles and will not have any impacts on aircraft at operating altitudes, as shown by the calculation.

Conditions proposed by the Applicant

- 27 The Applicant’s proposed updated conditions relating to aviation safety are appropriate and sufficient to address the issues identified in the Cyrrus assessment.

Potential Impacts/Costs of the Proposal

- 28 In preparing this statement, I confirm that I have read *Economic Assessment of Regional Significance and Claimed Third-Party Costs – Ryans Road Industrial Development* by Maggie Hong and Greg Akehurst (**Economic Assessment**), which I understand will be provided at the same time as this statement.
- 29 No significant operational impacts on Airways are anticipated to arise from the proposal. Any mitigation measures, where considered necessary to protect navigation equipment, are expected to be limited in scope, for example radar re-configuration or updating radar reflector files. Such mitigation may involve safety cases, radar manufacturer engineering support and flight trials to confirm the efficacy of the measures, the costs of which would be far outweighed by the proposal’s economic benefits, as set out in the Economic Assessment.

¹ https://www.indragroup.com/cms-content/importacion/5.1.2_psr3d_lband_sheet_0.pdf

Conclusion

- 30 The Cyrrus report assessment concludes that any potential effects on air navigation equipment are manageable to an acceptable standard and that worst-case scenarios have been modelled. Actual effects are expected to be less than those predicted by the modelling.

Dated 17 February 2026



Simon McPherson