

Before an Independent Hearings Panel
appointed by Christchurch City Council

under: the Resource Management Act 1991

in the matter of: the hearing of submissions on Plan Change 14 (Housing
and Business Choice) to the Christchurch District Plan

and: **Christchurch International Airport Limited**
Submitter 852

Statement of Christopher Day (Acoustics) in relation to the Tonkin
+ Taylor memorandum

Dated: 24 April 2024

REFERENCE: JM Appleyard (jo.appleyard@chapmantripp.com)
AM Lee (annabelle.lee@chapmantripp.com)

chapmantripp.com
T +64 3 353 4130
F +64 3 365 4587

PO Box 2510
Christchurch 8140
New Zealand

Auckland
Wellington
Christchurch



STATEMENT OF CHRISTOPHER DAY

- 1 I have reviewed the Tonkin +Taylor memorandum (the memo) which states a preference for the annual average approach (AA) over the outer envelope (OE). This is included at Appendix A.
- 2 I have also reviewed the evidence and submissions for the Selwyn process which are included at Appendix B and C. This covering statement provides a summary of my review.
- 3 The memo contains a number of inaccuracies and errors as follows.
 - 3.1 In **paragraph 1**, the memo states that the runway splits were derived from a 10 year period. This is incorrect - a 20 year period of data was analysed to establish the busiest 3 months.
 - 3.2 In the final sentence of **paragraph 2** the memo says, "The outer envelope contour is a theoretical contour that would never be achieved." Firstly, all future noise prediction contours are theoretical, including the AA. Secondly it is not correct to say "that would never be achieved". The heaviest wind usage (worst case) usage of north west (NW) runway has happened previously (it was in the data) so there is no reason why this would not happen in the future.
 - 3.3 What might be meant by the statement "would never be achieved" is that all four worst cases would never occur simultaneously. This is correct, but is irrelevant as this not what the contours are saying. The specific objective of the OE concept is to ensure that the contours represent what could happen in any three months. When the highest usage on the NW runway occurs, the residents under the NW approach are not interested whether it is busy on the main runway (which it won't be). Residents under the main runway tracks will get their busy period at a different time. In each case it represents their worst case affects and Christchurch Airport has to comply with the noise boundary in each of these three month periods. The AA contour is also a theoretical contour that will never happen exactly in that shape on one particular day.
 - 3.4 In **paragraph 3** the memo states that "in New Zealand and Australia average contours are the norm". This is correct and the memo correctly identifies in the previous sentence that NZS 6805 uses the average over a period of three months.
 - 3.5 Later on in **paragraph 3** the memo says 'some airports which have consistent movements have little difference between the OE and AA'. This is correct but doesn't apply at Christchurch where the usage of the NW runway is highly variable.
 - 3.6 The **final paragraph** says "For consistency with NZS 6805 and standard practice annual average contours are

appropriate." These two points are both incorrect. Firstly NZS 6805 recommends three months contours not annual and secondly the standard practice around other New Zealand airports is to use the three month average (except for Auckland).

- 4 In my opinion, if the Expert Panel has used this information to express a preference for the AA, the preference has been misinformed.

Dated: 24 April 2024

Christopher Day



MEMORANDUM

Date: July 14, 2022
To: Tammy Phillips
Ecan
From: Darran Humpheson
Subject: ANNUAL AVERAGE CONTOUR VERSUS OUTER ENVELOPE CONTOUR

The Christchurch International Airport Limited (CIAL) provided two sets of noise contours: an Annual Average Contour based on the average runway splits derived from a 10 year period and an Outer Envelope Contour which comprises the busiest usage recorded on each runway from the same 10 year period. The Outer Envelope Contour is a composite of the four max use contours (Runways 02, 11, 20 and 29).

The Annual Average Contour is based on the annual average movement numbers and does not reflect the normal busy 3 month period (no peaking factor applied). Whereas the Outer Envelope Contour is based on the worst case 3 month period. It uses appropriate peaking factors to increase the annual movement numbers to the busy 3 month period at Christchurch International Airport. The Outer Envelope Contour not only uses the highest 3 month usage for each runway, but it also applies the peak factor to establish a 'worst case' 3 month contour. The Outer Envelope Contour also includes a 10% addition to account for potential climate change effect on Runway 11/29 due to increased prevalence of nor-west wind conditions. The Outer Envelope Contour is a theoretical contour that would never be achieved.

The New Zealand Standard for airport noise management and land use planning (NZS 6805:1992) recommends that the average sound exposure is established over a period of 3 months or such other period as agreed between the operator and the local authority. In New Zealand and Australia, average contours are the norm, with or without a peaking factor applied to represent a busy period. For some airports which have reasonably consistent movements regardless of the time of the year, there is minimal differences between a busy 3 month contour and that derived from an annual average.

According to the International Organization for Standardization's ISO 15666-2021, *Acoustics — Assessment of noise annoyance by means of social and socio-acoustic surveys*, community noise exposure studies will determine community response to noise by establishing their annoyance response over the past 12 months. It is unusual for a social study to enquire about a respondents worst experience. As land based control contours use community response (noise annoyance) thresholds, the contours themselves should also be derived from situations that would normally be experienced by a community and not a hypothetical situation.

For consistency with NZS 6805 and standard practice, annual average contours with or without a peaking factor applied to represent a busy three months are appropriate.

cc: Stephen Smith, Ricondo & Associates, Inc.; Joseph Huy, Ricondo & Associates, Inc.; Erik Wilkins, Ricondo & Associates Inc.; Ian Kincaid, InterVISTAS; Ben Hargreaves, REHBEIN Airport Consulting

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Before an Independent Hearings Panel
appointed by the Selwyn District Council

under: the Resource Management Act 1991

in the matter of: Submissions and further submissions in relation to the
proposed Selwyn District Plan, Parts A and B of
Variation 1

and: Rolleston Rezoning Requests

and: **Christchurch International Airport Limited**
Submitter V10065 and PCV1-0036

Summary Statement of evidence of Laurel Smith (acoustics)

Dated: 24 May 2023

REFERENCE: JM Appleyard (jo.appleyard@chapmantripp.com)

AM Lee (annabelle.lee@chapmantripp.com)

chapmantripp.com
T +64 3 353 4130
F +64 3 365 4587

PO Box 2510
Christchurch 8140
New Zealand

Auckland
Wellington
Christchurch



SUMMARY STATEMENT OF EVIDENCE OF LAUREL SMITH

- 1 This is a summary statement to clarify the basis for the Outer Envelope and Annual Average Updated Contours presented in my evidence in chief. I will also comment on legal submissions from Mr Gerard Cleary that appear to reference a memo from Mr Darran Humpheson of Tonkin + Taylor (14 July 2022) regarding the Outer Envelope and Annual Average Updated Contour options.
- 2 The Updated Contours were prepared in accordance with current best practice using NZS 6805:1992 Airport Noise Management and Land Use Planning (**NZS 6805**) as a guide.
- 3 NZS 6805 recommends that noise boundaries are based on the 24 hour L_{dn} noise exposure averaged over three months or an alternative period as agreed by the airport operator and local authority. The standard does not recommend a 12 month average, only a three month average or an alternative. I am aware of only one New Zealand airport that has noise limits defined as a 12 month average (Auckland Airport). To my knowledge the majority of other NZ airports apply a 3 month average or reference NZS 6805.
- 4 To be thorough, CIAL's expert team prepared Updated Contours using both a three month approach and an alternative 12 month approach to provide both options for the decision making process.
- 5 The Outer Envelope Updated Contour represents the three month average. The Annual Average Updated Contour represents the alternative.
- 6 For Christchurch Airport, determining the three month average aircraft operations is more complex than simply finding the busiest three months by number of aircraft movements. The direction of runway usage over a given three months is also relevant and this is somewhat complex at Christchurch due to the multiple runways and variable wind conditions.
- 7 This means the busiest three month noise exposure for a receiver located north of the airport might occur in a different three months to a receiver located west of the airport. The only way to represent the busiest three month exposure for every receiver location is to model the busiest three months for each of the four runway directions. This is what the Outer Envelope Updated Contour does.
- 8 In addition to modelling the busiest three months of runway usage in each direction, a peaking factor has been applied to the number of annual aircraft movements to account for the busy three month peak in movement numbers.

- 9 In summary, for a given location, the Outer Envelope Updated Contours represent a prediction of the future busiest 3 month noise exposure (the defined averaging period in NZS 6805).
- 10 The Annual Average Updated Contour is a simplification of the fluctuations in aircraft activity and resulting noise exposure that occur throughout a year. It is simply calculated on the 12 month average runway usage and 12 month average number of aircraft movements.
- 11 In summary, for a given location, the Annual Average Updated Contours represent a prediction of the future 12 month average noise exposure.

TONKIN + TAYLOR MEMORANDUM

- 12 I have read the memorandum dated 14 July 2022 from Tonkin + Taylor to Environment Canterbury regarding the Outer Envelope and Annual Average modelling approaches.
- 13 I have identified some statements in the memo that I do not agree with. Also, I note Mr Cleary has misquoted Mr Humpheson in paragraph 3.19 of his legal submissions. Mr Humpheson does not state that *'in New Zealand and Australia annual average contours are the norm'*. Rather he states that *'average contours are the norm'*.
- 14 Mr Clearly also refers to Mr Humpheson's description of the Outer Envelope being *'a theoretical contour that would never be achieved'*. I agree that the Outer Envelope contour, like all future predictions, is theoretical. I also agree that the contour in its entirety would not occur simultaneously as it represents four different runway operating scenarios which cannot all occur simultaneously. However, the purpose of the Outer Envelope Contour is to represent the busy 3 month noise exposure for all receiver locations, not the simultaneous busy 3 month noise exposure.
- 15 In summary, this memorandum did not form part of the peer review process final outcomes. That process was limited to the modelling inputs and methodologies and did not involve recommendations regarding which of the two options is more appropriate for planning purposes.

Dated: 24 May 2023

Laurel Smith

Before an Independent Hearings Panel
appointed by the Selwyn District Council

under: the Resource Management Act 1991

in the matter of: Submissions and further submissions in relation to
Variation 1 to the proposed Selwyn District Plan

and: Rolleston Rezoning Requests

and: **Christchurch International Airport Limited**
Submitter V1-0065 and PCV1-0036

Supplementary legal submissions on behalf of Christchurch
International Airport Limited

Dated: 24 May 2023

Reference: J M Appleyard (jo.appleyard@chapmantripp.com)
A M Lee (annabelle.lee@chapmantripp.com)

chapmantripp.com
T +64 3 353 4130
F +64 4 472 7111

PO Box 2510
Christchurch 8140
New Zealand

Auckland
Wellington
Christchurch



SUPPLEMENTARY LEGAL SUBMISSIONS ON BEHALF OF CHRISTCHURCH INTERNATIONAL AIRPORT LIMITED

- 1 Christchurch International Airport Limited's concerns at this Rolleston Rezoning hearing are confined to the request by Four Stars Development Limited & Gould Developments Ltd (the *Submitter*) to rezone land in Rolleston.
- 2 As the Panel is aware, a portion of that land is subject to the operative 50dB Ldn Air Noise Contour for Christchurch International Airport as shown on Map A of the Canterbury Regional Policy Statement.¹ The site is now also subject to the 2023 remodelled 50dB Ldn Air Noise Contour (Outer Envelope methodology).²
- 3 Below we respond to matters raised by Mr Cleary in legal submissions filed for this hearing.

Hierarchy of planning documents - interplay between NPS UD 2020 and RPS

- 4 Our legal submissions filed for CIAL for the Qualifying Matters hearing, as well as various briefs of evidence filed for CIAL in various hearing topics, outline the applicable higher order planning framework.
- 5 In brief, the status of Christchurch International Airport as infrastructure of local, regional and national importance is recognised in the definition of "nationally significant infrastructure" in the National Policy Statement on Urban Development 2020 (*NPS UD*), the Canterbury Regional Policy Statement (CRPS) and in the Objectives and Policies of the operative and proposed District Plan.
- 6 The efficient use and development of Christchurch Airport as a significant physical regional infrastructure resource is provided for in the CRPS.³ The CRPS provisions are unambiguous and highly directive – new noise sensitive activities must be avoided within the 50dB Ldn Air Noise Contour.
- 7 The NPS UD directs that local authority decisions on urban development are integrated with infrastructure planning decisions,⁴ and that planning decisions contribute to well-functioning urban environments.⁵ The NPS UD requires a balance between the need to provide for urban development capacity and other important countervailing issues such as the provision of infrastructure.

¹ And that portion was declined for rezoning by the Commissioner for PC71.

² However, CIAL do not seek to undo residential zoning already approved within the 2023 remodelled contours.

³ See Objective 5.2.1(f), Policy 6.3.5 and Policy 6.3.9(5).

⁴ Objective 6.

⁵ Policy 1.

- 8 Policy 8 of the NPS UD requires councils to “be responsive” to plan changes for unanticipated or out of sequence development that will provide significant development capacity and contribute to well-functioning urban environments. Policy 8 must also, however, be read in the context of other policies in the NPS UD (such as the those relating to infrastructure).
- 9 While the NPS UD was prepared later in time, it does not automatically trump all other planning documents. It is a well-established principle of statutory interpretation that where there is any apparent inconsistency or tension between or within statutory instruments, the approach is to read both together and prefer an interpretation which reconciles any apparent inconsistency, allowing the two to stand together.
- 10 The policies of the NPS UD, including the responsiveness provisions, can, and should, be read together with the CRPS policies in this context. To that end:
 - 10.1 When considering the Submitter’s request to rezone land in Rolleston, the Panel must ensure it will give effect to both the NPS UD and the CRPS.⁶ Policy 6.3.5(4) of the CRPS is plainly highly relevant to land that the evidence shows will potentially be subject to aircraft noise levels of 50dB Ldn.
 - 10.2 The rezoning request seeks to provide for urban development in an unplanned way or in a way that was out of step with the provision in planning documents. Hence NPS UD Policy 8 requires the Panel to have particular regard to the significance of the development capacity provided, and whether it contributes to a well-functioning urban environment (and other relevant matters required by the NPS-UD).
 - 10.3 A rezoning request that proposes urban development or intensification in an area where future residents will be subject to aircraft noise of 50dB Ldn or greater would not contribute to a well-functioning urban environment.
 - 10.4 It is therefore not as simple as saying that the NPS UD “trumps” the CRPS in this context, and the CRPS has no application. The relevant provisions must be read together and reconciled, if possible. In this case, the provisions can be reconciled. The end result from both a policy and merits perspective is that rezoning of land subject to levels of noise of potentially 50dB Ldn or greater will not give effect to the collective requirements of these higher order documents.

⁶ Section 75 of the Resource Management Act.

Modelling methodology

- 11 As the Panel is aware, the 2023 remodelled 50dB Ldn Air Noise Contours comprise an Outer Envelope and Annual Average methodology.
- 12 Mr Cleary's submissions suggest that Environment Canterbury's Independent Peer Review Panel will confirm that the Annual Average is the preferred modelling approach. Mr Cleary's submissions rely heavily on a memorandum that purportedly confirms this approach. Mr Cleary's submissions also suggest the Annual Average approach has been adopted by the Christchurch City and Waimakariri District Councils.
- 13 To "correct the record":
 - 13.1 As we have discussed with the Panel previously, CIAL does not expect the Peer Review Panel to confirm the preferred modelling approach – only to confirm where the contour lines ought to be.
 - 13.2 Confirmation of the modelling approach is not a matter for determination by acoustic experts alone. It requires policy, economic and planning input because it is essentially an exercise of translating noise modelling into land use planning controls. Matters such as housing supply and demand will be relevant.
 - 13.3 The memorandum referred to by Mr Cleary is not a recommendation of the expert panel. Our interpretation of the memorandum (which is 10 months old) is that it simply explains that the Annual Average modelling approach is valid from a technical perspective. It does not state that it is to be preferred over the Outer Envelope approach for Canterbury. Further, it is an opinion from an acoustic expert at Tonkin + Taylor in his personal, expert capacity. It does not, and does not purport to, represent the views of the Peer Review Panel or of Environment Canterbury, the ultimate decision maker of the air noise contours. CIAL and its advisers remain unclear as to the purpose or status of the memorandum.
 - 13.4 As we have also discussed with the Panel, the fact that the 50dB Ldn Air Noise Contours notified in Christchurch and Waimakariri's intensification planning instruments (*IPIs*) were based on the Annual Average methodology is not definitive. The Section 77K Reports prepared by Mr Millar to assist Council's preparation of those IPIs were tailored to the Annual Average methodology but explicitly state:⁷

⁷ Section 77K Report for Waimakariri, para 10:
https://www.waimakariri.govt.nz/_data/assets/pdf_file/0025/114964/VARIATION-1-HOUSING-INTENSIFICATION-QUALIFYING-MATTER-AIRPORT-NOISE-SECTION-32-REPORT-APPENDIX-1.pdf

The Independent Experts confirmed the appropriateness of retaining the 50dB Outer Control Contour (OCB), but provided ECan with two recommended options for consideration; being:

a. A contour based on the busiest three-month period of use on each runway (the Outer Envelope); and

b. A contour based on the annual average runway use (the Annual Average).

13.5 And:⁸

It needs to be acknowledged, however, that should the ECan Review Panel recommend the Outer Envelope contour be used for land use planning, or a combination of the Outer Envelope and Annual Average, then a submission on Plan Change 14 will be required in order to give the Hearings Panel scope to confirm the correct contour and qualifying matter within the District Plan. It is accepted that this it is not an ideal situation, but it is, unfortunately, a product of the programming of both Plan Change 14 (as directed by legislation) and the timing of the review of the contours.

13.6 Ultimately, it is simply not correct that the other two Councils have “preferred the [Annual Average] over the [Outer Envelope]”. They notified the Annual Average on the basis of Section 77K reports specifically tailored to the Annual Average and those Section 77K reports were produced for specific circumstances, that is, to address the risk of MDRS standards having immediate legal effect at the time of notification. No decisions have been made as to the final approach and they are decisions to be made by Independent Hearings Panels.

13.7 CIAL’s submissions on both IPIs include the Annual Average and Outer Envelope methodologies. It is therefore very much open that either of the methodologies might be adopted in the decision-making.

13.8 Furthermore, the operative contour has not been disregarded by CCC or WDC. In Christchurch City, the Annual Average contour is larger than the operative contour; CCC therefore notified the Annual Average as the qualifying matter to prevent immediate legal effect within that area. The opposite occurs at Waimakariri where the operative contour is larger than the Annual Average. WDC therefore notified both the

⁸ Section 77K Report for Christchurch City, para 11:
https://www.ccc.govt.nz/assets/Documents/The-Council/Plans-Strategies-Policies-Bylaws/Plans/district-plan/Proposed-changes/2023/PC14/Section-32-Appendices-1/PC14-QM-s77K-CIAL-Christchurch-District-Plan_Updated-Report_AA_-final-11-July-2022.PDF

operative contour and the Annual Average. That prevented immediate legal effect within the larger Operative contour.

- 14 We emphasise again that the work done by CIAL to assist those Councils in preparation for notification of those IPIs does not reflect CIAL's position on which methodology is more appropriate for Canterbury. As outlined above, now that the remodelled contours have been confirmed from an acoustics perspective, the determination of the final contours requires economic, planning and policy input.

Evidential basis in support of CIAL's relief

- 15 Mr Cleary's submissions state that:⁹

"Preventing the rezoning of the land is not justified on the basis of the evidence before the Panel. There is no evidence that a rezoning will compromise the safe and efficient operation of Christchurch Airport."

- 16 The need to protect and provide for the safe and efficient operation of Christchurch Airport, including via land use controls associated with the Air Noise Contours, is addressed in evidence of Mr Page, Ms Smith and Ms Hayman filed for the Qualifying Matters hearing. They also each attach evidence that was filed for the proposed District Plan, which explains the evidential basis for CIAL's relief in greater detail.

- 17 The evidence presented to this Panel explains why residential rezoning of land in areas potentially subject to 50dB Ldn has the potential to affect the efficient operation, use, development and safety of Christchurch Airport. We note two matters here:

17.1 Where noise levels of 50dB Ldn are to be expected by residents has been the subject of a remodelling process – i.e. the best available evidence has recently been updated.

17.2 However, the operative 50dB Ldn contour cannot be completely disregarded in favour of a remodelled contour until that remodelled contour is formally included in the planning framework.

- 18 At the moment the information available to the Panel includes the operative contour, the annual average and the outer envelope contour. At this stage of information gathering the Panel should adopt the most conservative approach which is the outer envelope, or a fall back to the operative contour in relation to the PC71 land.

⁹ Paragraph 2.9.

Dated 24 May 2023

J Appleyard / A Lee
Counsel for Christchurch International Airport Limited