

**BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE  
WAIMAKARIRI DISTRICT COUNCIL**

**IN THE MATTER OF**

The Resource Management Act 1991 (**RMA** or  
**the Act**)

**AND**

**IN THE MATTER OF**

Hearing of Submissions and Further  
Submissions on the Proposed Waimakariri  
District Plan (**PWDP** or **the Proposed Plan**)

**AND**

**IN THE MATTER OF**

Submissions and Further Submissions on the  
Proposed Waimakariri District Plan by  
**McAlpines Limited (McAlpines)**

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**EVIDENCE OF WILLIAM PETER REEVE  
ON BEHALF OF MCALPINES LIMITED**

Dated: 7 August 2023

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## **INTRODUCTION**

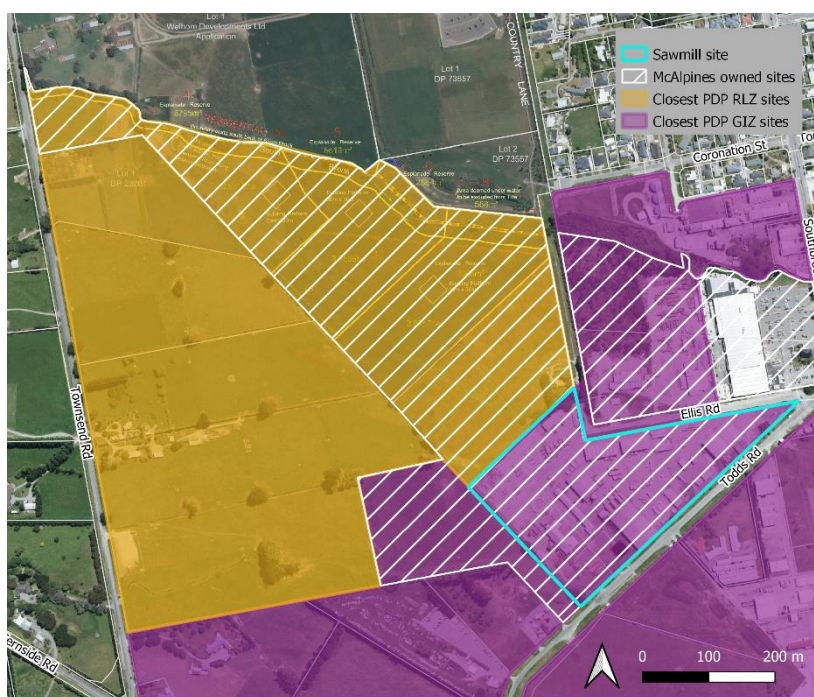
- 1 My name is William Peter Reeve. I am employed as a Senior Associate with Acoustic Engineering Services.
- 2 I hold a Bachelor of Engineering with Honours from the University of Auckland. I am a member of the Acoustical Society of New Zealand.
- 3 I have over 11 years' experience in the field of acoustic engineering consultancy and have been involved with many environmental noise assessments on behalf of applicants, submitters and as a peer reviewer for Councils. My experience includes measurements and mitigation advice relating to large scale timber processing activity in Southland and Nelson. I have also provided advice relating to the Daiken NZ manufacturing plant in Ashley.
- 4 I have read the Environment Court's Code of Conduct and agree to comply with it. My qualifications as an expert are set out above. The matters addressed in my evidence are within my area of expertise, however where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

## **SCOPE OF EVIDENCE**

- 5 In my evidence I:
  - (a) Discuss typical noise limits for the protection of residential amenity, based on the District Plan standards, and national and international guidelines.
  - (b) Describe the nature, and level of noise emission from existing activities on the McAlpines sawmill site; and
  - (c) Identify the extent of Rural Lifestyle Zone land where further controls would need to be implemented to minimise the risk that future development near the sawmill, would give rise to reverse sensitivity effects as a result of noise.

## CONTEXT

- 6 McAlpines own a site located between Ellis Road and Todds Road in Rangiora which contains a sawmill, and associated timber treatment, drying and machining activities. McAlpines also own several other sites around the periphery of this site which are used for various purposes, including some as buffer land around the sawmill.
- 7 The sawmill and most of the sites immediately adjoining it to the south are zoned General Industrial (GIZ) in the Proposed District Plan (PDP) as shown in purple in the figure below. There are rural sites to the north and west of the sawmill, which are zoned Rural Lifestyle (RLZ) under the PDP and are shown yellow in this figure. One of the sites owned by McAlpines in the Proposed RLZ has an approved subdivision consent.



- 8 The sawmill activity has operated from this site since 1964. I understand that it was lawfully established under the previous planning instruments and can legitimately claim existing use rights. This means that noise emissions from this activity are not constrained by the noise controls in the Operative or Proposed District Plans.
- 9 I have been engaged by McAlpines to establish current noise emissions from the sawmill, and to determine the likely noise effects should new noise sensitive development occur on the adjoining RLZ sites. This is the highest risk

area for McAlpines, given the higher intrazonal noise limits for GIZ sites to the south, and the development of the Rangiora Business Hub on the opposite side of Todds Road.

- 10 I visited the site in September 2020 in order to measure noise levels from several of the louder processing activities and establish the overall noise generation from the sawmill site. I also undertook a week-long logging measurement exercise in November 2022 to gather further information about the noise levels from the sawmill received offsite at properties to the north and west.

### **ACCEPTABLE NOISE LEVELS**

- 11 To determine the acceptable thresholds for noise from the sawmill at a residential dwelling in the vicinity, should further development occur, I have reviewed both the District Plan limits and other national and international guidance.
- 12 The Operative District Plan outlines a 50 dBA  $L_{10}$  daytime limit which applies at the notional boundary of dwellings in the rural zone between 7 am and 7pm Monday to Saturday, and 9 am to 7 pm Sundays (and public holidays). A 40 dBA  $L_{10}$  limit applies at other times.
- 13 The PDP daytime limit, which applies between 7 am and 10 pm is 50 dB  $L_{Aeq}$ , which also applies at the notional boundary of any dwellings in the rural zone. A limit of 40 dB  $L_{Aeq}$  and 70 dB  $L_{AFmax}$  applies outside this time.
- 14 The key changes in the PDP are the replacement of the existing  $L_{10}$  metric with the current best practice  $L_{Aeq}$  metric, which is required by the National Planning Standards, and a shorter night-time period which is now consistent across the week (rather than a shorter daytime period on Sundays and Public Holidays only).
- 15 While these controls reflect a typical District Plan threshold for residential areas in New Zealand, I observe that they are more conservative than the upper limits recommended by WHO and NZS 6802:2008 for the protection of residential amenity, which are in the order of 5 dB higher.
- 16 For example, NZS 6802:2008 Acoustics – Environmental noise outlines a guideline daytime limit of 55 dB  $L_{Aeq(15\ min)}$  and a night-time noise limit of 45

dB  $L_{Aeq}$  (15 min) for *“the reasonable protection of health and amenity associated with the use of land for residential purposes”*.

- 17 Guidelines for Community Noise, a document produced by the World Health Organisation (WHO) based on extensive international research recommends a guideline limit of 55 dB  $L_{Aeq}$  (16 hours) to ensure few people are seriously annoyed in residential situations. A guideline limit of 50 dB  $L_{Aeq}$  (16 hours) is recommended to prevent moderate annoyance. A guideline night-time limit of 45 dB  $L_{Aeq}$  (8 hours) is recommended to allow occupants to sleep with windows open.
- 18 I have given some thought to whether a 50 dB  $L_{Aeq}$  / 40 dB  $L_{Aeq}$ , or 55 dB  $L_{Aeq}$  / 45 dB  $L_{Aeq}$  threshold for a reverse sensitivity control is most appropriate in this instance.
- 19 I observe a 55 dB  $L_{Aeq}$  / 45 dB  $L_{Aeq}$  threshold to be consistent with controls for other similar large industrial noise emitters in this and other Districts (for example Daiken, or large dairy processing plants). My experience has been that noise related issues become far more likely when these thresholds are not met.
- 20 I also note that since noise levels received several hundred metres from a large industrial emitter will vary by a moderate amount due to the influence of weather, a prediction based on a typical worst-case scenario, will mean that noise levels are not consistently at the “upper thresholds” – and may often be at a level more consistent with the general residential noise standards in the Plan.
- 21 For these reasons I expect that the risk of serious annoyance for occupants of these sites, and therefore reverse sensitivity effects on the sawmill, becomes most likely at dwellings where noise levels from the sawmill exceed the upper guideline values given in NZS 6802:2008 of 55 dB  $L_{Aeq}$  during the daytime, and 45 dB  $L_{Aeq}$  during the night-time.

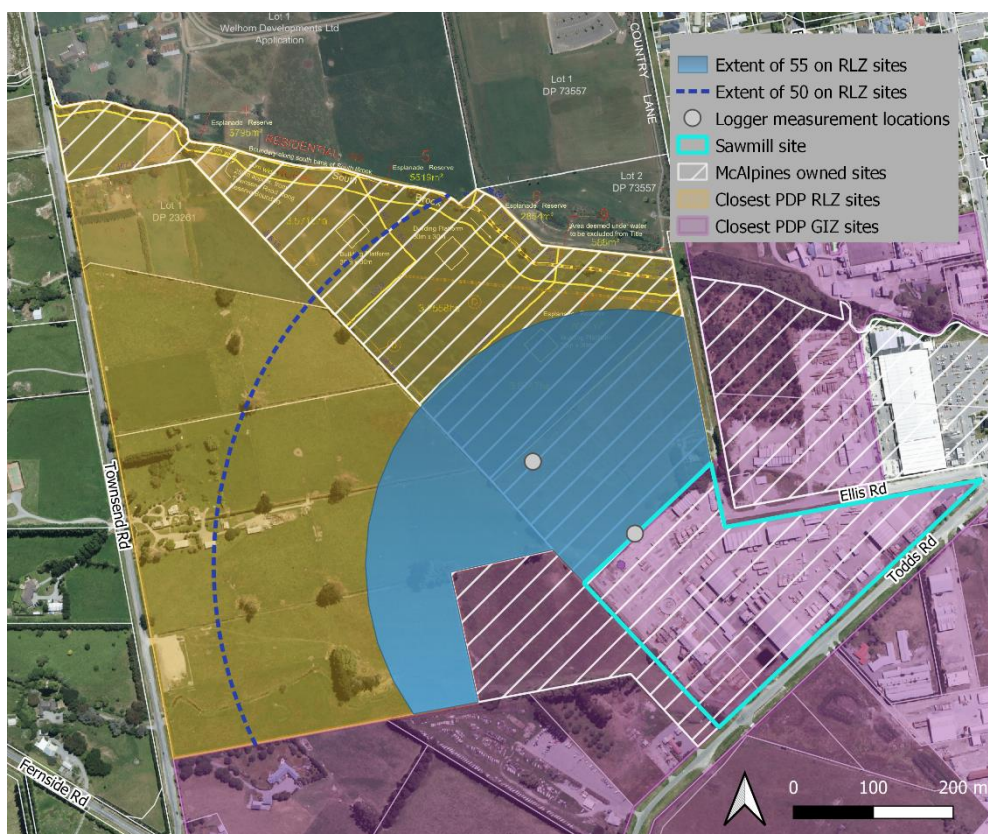
#### **NOISE EMISSIONS FROM MCALPINES SAWMILL**

- 22 To establish noise emissions from the McAlpines sawmill, I visited the sawmill in September 2020 and measured noise levels from several of the louder processing activities in general accordance with NZS 6801:2008.
- 23 The sawmill operates from 7 am to 4.30 pm, Monday to Friday, although there is associated activity on site, including from forklift and truck movements

which occurs from 6:30 am to 5 pm. There are also some parts of the site that operate on a Saturday, for half a day (6 am to 12 pm).

- 24 Some activities also operate during the core night-time period, although these generate lower noise levels at sites to the north-west. This includes timber drying kilns and associated forklift movements which occur 24/7. The water treatment plant can also operate for extended hours (6 am – 11 pm Monday to Friday).
- 25 The stacker is one of the key noise sources. The stacking machinery is in an open-ended shed on the northern edge of the site. I measured noise levels in the order of 75  $L_{Aeq}$  at the infeed end of the stacker, 30 metres from the main source of the noise. This activity has a distinctive character due to timber clattering and striking parts of the conveyor system.
- 26 This machinery typically operates 7 am to 5 pm Monday to Friday. It can sometimes operate longer hours, from 6 am until 7 pm weekdays, or on Saturdays from 6 am to 12 pm.
- 27 I also measured noise levels in the order of 75 – 79 dB  $L_{Aeq}$  at 20 metres from the main log processing building, due to breakout from the building and contributions from the debarker, timber handling conveyors, cyclones and the chipper.
- 28 Mobile machinery on site includes incoming and outgoing heavy vehicle movements, and the use of loaders with reversing alarms for various material handling activities. An excavator is used to feed the debarker, although I understand that it operates from a fixed location on the site.
- 29 There are various other noise sources on the site, such as planers and kiln motors. These activities are typically enclosed or screened for the sites to the northwest.
- 30 I have used these close proximity measurements to predict the noise levels which will be received various distances from the site. The predictions are based on the level of operation that I observed on site with contributions from the stacker, main processing building and log yard with a truck being unloaded.
- 31 I used the ISO 9613 prediction algorithm which is typical practice and assumes favourable noise propagation conditions.

- 32 Using this method, I calculated a rating noise level of 55 dB  $L_{Aeq}$  at 320 metres from the acoustic centre of the sawmill site (which is close to the northwest boundary). This calculation includes a +4 dB adjustment to measured levels due to a +5 dB penalty for Special Audible Characteristics (for the special character which includes timber clattering) and a -1 dB duration adjustment (because material handling and processing does not occur all day).
- 33 I verified these predicted levels by undertaking further monitoring in November 2022. On this occasion, I placed noise logging equipment on the northwest boundary of the site containing the sawmill as shown in the figure below. A second noise logger was placed close to the boundary of the McAlpines owned site to the northwest of the sawmill. This equipment was in place for a week with the intent of capturing sawmill noise close to source where it would be clear in the measurement results and comparing this to the measurements close to the boundary of the McAlpines land.
- 34 Measured noise levels varied with weather and sawmill activity, but there were many periods when the rating noise level from sawmill noise could be calculated as 55 – 60 dB  $L_{Aeq}$  near the second logger location which confirms that the earlier prediction methodology is reasonable.
- 35 The figure on the next page shows (by the shaded blue area) the extent of nearby RLZ sites where I expect rating noise levels of higher than 55 dB  $L_{Aeq}$  from the sawmill. These areas are therefore at the greatest risk of receiving noise levels which are incompatible with residential amenity.
- 36 I recommend that this 55 dB  $L_{Aeq}$  contour is depicted in the Planning Maps. This should be accompanied by controls, which restrict the ability for residential development, or other development with a similar noise sensitivity, to occur without acoustic assessment from a suitably qualified expert. This assessment will need to demonstrate that appropriate noise levels can be achieved both inside dwellings and in associated primary outdoor areas. The planning mechanisms proposed to achieve this, are discussed further in the planning evidence of Mr Walsh, and in legal submissions.
- 37 I note that the measured and predicted noise levels also confirm that noise from the sawmill would exceed the permitted activity threshold in the ODP and PDP over an even wider area. The likely extent of exceedance with the PDP daytime limit, in the RLZ zone is shown by the blue dashed line.



- 38 By extension, my measurements and predictions indicate that the PDP residential daytime limit may be exceeded over a very small corner of the residentially zoned site at 141 South Belt, and potentially at some residential properties near the western extent of Coronation Street. I note that since the calculations have been undertaken primarily with a focus to the north-west, noise levels have not specifically been measured on Coronation Street.
- 39 Given that the items of machinery that will generate the loudest noise levels to the north-west typically operate during the daytime period, noise levels are generally expected to be 45 dB  $L_{Aeq}$  or lower during the night-time within the area shaded blue in the figure above. This means that the controls required to manage daytime effects should also control night-time noise effects as well.
- 40 The operation of the stacker is a potential exception to this, since it generates higher sound levels to the north-west, and can sometimes operate from 6 am, for an hour of the night-time period defined by the PDP. Given this is not a regular occurrence, and the brevity of the intrusion into the night-time period, I still consider the extent of the daytime control I have shown above to cover



the area at greatest risk of receiving noise levels which are incompatible with residential amenity.

- 41 I note that for external noise levels of 55 dB  $L_{Aeq}$ , typical internal design levels for bedrooms would be achieved with windows closed. On this basis, I expect that noise effects from occasional early morning operation of the stacker, for future residents outside the depicted 55 dB  $L_{Aeq}$  area could be managed by closing windows, without the need for additional dwelling mitigation such as a ventilation system.

### **MATTERS RAISED BY SUBMITTERS AND THE OFFICER REPORT**

- 42 I have reviewed the Variation 1 summary of submissions document, as it relates to the Noise Chapter. I have also reviewed the document collating further submissions on Variation 1. I am not aware of any submissions in conflict with the McAlpines proposal to implement acoustic controls to protect their operation from reverse sensitivity.
- 43 I have also reviewed the subsequent Officer's Report. The McAlpines submission is not discussed in any detail in the Officer's Report, which notes the matter is to be covered in the Rural Chapter. Given specific controls required to control the reverse sensitivity effects from McAlpines operation, are most likely to be located in the Noise Chapter I understand that it is appropriate for discussion to occur in this stream.

### **CONCLUSION**

- 44 There are several undeveloped rural sites to the north and west of the McAlpines sawmill in Rangiora. The sawmill has existing use rights and noise emissions are not constrained by the noise controls in the ODP or PDP. Noise monitoring has confirmed that these limits would be exceeded at the notional boundary of future dwellings built on areas of the rural sites to the north-west of the sawmill.
- 45 In order to determine the acceptable thresholds for environmental noise at a residential dwelling in the vicinity of the sawmill, should further development occur, I have reviewed both the District Plan limits and other national and international guidance. A review of other guidance shows that the District Plan guidelines are lower than the upper guideline limits of 55 dB  $L_{Aeq}$  and 45 dB  $L_{Aeq}$  outlined in NZS 6802:2008 and the WHO Community Guidelines.

- 46 At dwellings where noise levels from the sawmill exceed the upper guideline value of 55 dB  $L_{Aeq}$  in NZS 6802:2008 the risk of serious annoyance for occupants of these sites, and therefore reverse sensitivity effects on the sawmill becomes more likely. The extent where a rating noise level of 55 dB  $L_{Aeq}$  would be exceeded on adjoining RLZ sites has been predicted and covers an area of the sites to the northwest of the sawmill, including McAlpines owned land.
- 47 I recommend that this 55 dB  $L_{Aeq}$  contour is depicted in the Planning Maps. This should be accompanied by controls, which restrict the ability for residential development, or other development with a similar noise sensitivity, to occur without acoustic assessment from a suitably qualified expert. This assessment will need to demonstrate that appropriate noise levels can be achieved both inside dwellings and in associated primary outdoor areas. The planning mechanisms proposed to achieve this, are discussed further in the planning evidence of Mr Walsh, and in legal submissions.
- 48 Thank you for the opportunity to present my evidence.

William Reeve  
7 August 2023