# BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED BY THE TIMARU DISTRICT COUNCIL

IN THE MATTER OF	The Resource Management Act 1991 ( <b>RMA</b> or <b>the Act</b> )
AND	
IN THE MATTER OF	Hearing of Submissions and Further Submissions on the Proposed Timaru District Plan ( <b>PTDP</b> or <b>the Proposed Plan</b> )
AND	
IN THE MATTER OF	Submissions and Further Submissions on the Proposed Timaru District Plan by <b>Waipopo</b>

# EVIDENCE OF ROBERT KERR ON BEHALF OF WAIPOPO HUTS TRUST AND TE KOTARE TRUST REGARDING HEARING (E2) CULTURAL VALUES

Huts Trust and Te Kotare Trust

Dated: 23 January 2025

Presented for filing by: Chris Fowler / Shona Walter **Saunders & Co** PO Box 18, Christchurch Telephone: 021 311 784 / 022 400 6676 Email: chris.fowler@saunders.co.nz / shona.walter@saunders.co.nz

#### INTRODUCTION

- 1 My name is Robert Thomas Pyne Kerr.
- 2 I hold a Bachelor of Engineering, with Honours, and am a Chartered Professional Engineer. I have over 30 years' experience in the field of infrastructure engineering and have particular experience in flood and stormwater management.
- 3 I am the director of Kerr and Partners Limited.
- 4 My role in relation to the Timaru Proposed District Plan (**Proposed Plan**) is as an independent expert witness to Waipopo Huts Trust (**Waipopo Huts**) and Te Kotare Trust (**Te Kotare**) on matters relating to flood hazard.
- 5 Although this is not an Environment Court proceeding, 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**

- 6 In my evidence I address the following topics:
  - (a) The risk of flooding of the Waipopo Huts.
  - (b) The hazard from a stopbank breach.
  - (c) Managing the flood hazard on the Waipopo Huts.

#### SUMMARY OF MY EVIDENCE

7 My evidence assesses the flood hazard to the Waipopo Huts from a breach of the Opihi River Stopbanks. In summary, I am concerned that the assessments undertaken by Environment Canterbury (**ECan**) are overly conservative leading to the actual flood hazard being overstated, and the actual hazard is not likely to meet the threshold of high hazard under the Canterbury Regional Policy Statement (**CRPS**).

- 8 That said, I consider that it is prudent to manage future development in the area so not to materially increase the impact of any flooding on people and property at the Waipopo Huts.
- 9 As such, I am able to support an approach where the lower lying areas closest to the stopbank retain a form of existing use rights, but are limited as to the ability to develop, with the higher area able to build modern homes, subject to compliance with finished floor level requirements.

#### THE RISK OF FLOODING ON THE WAIPOPO HUTS

- 10 ECan have undertaken a number of assessments in relation to the adjacent Opihi River. The principal work is a report: '*Timaru District recreational hut communities, overview assessment of flooding hazards'*, (ECan report) attached at **Appendix A**. Further advice from ECan was provided to the Trust in a letter dated 23 April 2024 (Flood Hazard Assessment – Potential Demolition and Rebuild of Dwellings Waipopo Road, Waipopo Huts, Fauth, 2024), (ECan letter) attached at **Appendix B**.
- 11 These assessments show evidence that the area around the site has been flooded, or almost flooded in the past although there is no historical evidence that the site itself has been inundated.
- 12 There are stopbanks on both sides of the Opihi River, and these have breached in the past (mostly on the north side), albeit work has been undertaken to improve the strength of the stopbanks.
- 13 The ECan report states the current channel has capacity for 2% (50 year ARI) rainfall event.<sup>1</sup> If a stopbank breaches, then a significant portion of the flow will go through the breach rather than over the top of the banks elsewhere.
- 14 In my opinion this means that larger events, such as the 0.2% (1:500 year) rainfall event, would lead to individual breaches (break) in the stopbank. This is because the water flowing over the stopbank, combined with localised effects

*<sup>&</sup>quot;Timaru District recreational hut communities, overview assessment of flooding hazards",* Report No. R20/57, Chris Fauth and Michelle Wild, November 2020, p.26.

such as weaknesses in the bank, bends in the channel or other triggers such as the shape of the bed causing localised scouring, cause the stopbank to scour out and breach.

- 15 The location of those breaches, and the shape of the land outside the stopbanks, will then determine where the water will flow, where flooding will occur and how deep the water is. Some locations along any stopbank are more susceptible to this occurring than others due to the factors referred to above.
- 16 The 0.2% (1:500 year ARI) event is relevant because it is the flood frequency used to define a high flood hazard in the operative CRPS, as follows:<sup>2</sup>

High hazard areas are:

- 1. flood hazard areas subject to inundation events where the water depth (metres) x velocity (metres per second) is greater than or equal to 1 or where depths are greater than 1 metre, in a 0.2% annual exceedance probability flood event;...
- 17 The ECan report assumed breaches at various locations along the stopbank on the south side of the river and assessed the impact on the Waipopo Huts and surrounding area of a 0.2% AEP rainfall event (500 year ARI) should a breach occur at the assumed locations.
- 18 The ECan report states that the main huts area avoids serious flooding in a range of modelled scenarios when flooding originates from upstream.<sup>3</sup> I agree with this assessment and that the site is not subject to a high hazard from breaches originating upstream of the site.

#### HAZARD FROM ADJACENT STOPBANK BREACH

19 However, there is potential for severe flooding should the stopbank breach immediately adjacent to the houses on the Waipopo site. This is a low probability scenario but would have high consequences for the dwellings, and for the safety of any resident present during a flood.

<sup>&</sup>lt;sup>2</sup> Canterbury Regional Policy Statement, p.242.

<sup>&</sup>lt;sup>3</sup> *"Timaru District recreational hut communities, overview assessment of flooding hazards",* Section 4.8, p.32, paragraph 2.

- 20 An assessment of the stopbank setback was undertaken by ECan (ECan report),<sup>4</sup> and shows that in some places the locations where water is greater than 1m deep can be a lot closer to the river, while in other areas, the current District Plan 100m catch-all setback may not cover the full extent of the expected high hazard area.
- 21 The ECan report<sup>5</sup> acknowledges that there are limitations to determining the high hazard stopbank setback distance using this methodology, but it is considered to represent a conservative yet realistic approach. I agree that the setback line determined by this method is appropriate.
- A key matter however is the likelihood of the stopbank breaching at this location. If the likelihood is very low, as acknowledged by the ECan report,<sup>6</sup> then how likely is the combination of both a rainfall event and a breach at this location, and does it meet the 0.2% flood event threshold in the CRPS?
- The ECan letter provides additional analysis of the likelihood of the breach occurring adjacent to the Waipopo huts.<sup>7</sup> In summary, the ECan letter assumed a 20% likelihood of the breach occurring at this location, however it is unclear of the basis for this assumption. When multiplying this 20% probability against a 2% AEP rainfall event (being the capacity of the channel), this would translate to a 0.4% AEP flood event (1:250 year) passing through the Waipopo Huts.
- 24 If the assumption of a 20% likelihood of breach in a 2% AEP rainfall event is correct, then this event would meet the definition of high hazard.
- 25 However, I am concerned that the 20% assumption is not based on any robust methodology or assessment. It would seem materially higher than expected in the context of an almost certain breakout at the SH1/Railway location upstream and that the likelihood of breakout on either side of the river is about the same.
- 26 The impact of this breach assumption is material, in that if a (say) 5% likelihood is assumed, then this would translate to a 0.1% (1:1000) probability of a breakout flowing through the Waipopo Huts. That is, under these assumptions

*"Timaru District recreational hut communities, overview assessment of flooding hazards",* Section 4.4.

<sup>&</sup>lt;sup>5</sup> *Ibid.*, Section 4.4, p.22, paragraph 3.

<sup>&</sup>lt;sup>6</sup> *Ibid.*, Section 4.8, p.32, paragraph 2.

<sup>&</sup>lt;sup>7</sup> Letter from Chris Fauth to Waipopo Trust "Flood Hazard Assessment – Potential Demolition and Rebuild of Dwellings Waipopo Road, Waipopo Huts", dated 23 April 2024.

the flood hazard at the Waipopo Huts would not meet the definition of High Hazard (i.e. flooding of more than 1m deep less likely than 0.2% AEP (1:500)).

- 27 To support this contention that the likelihood of a breach adjacent to the huts is not as high as 20% and is more likely to be lower than 10%, I make the following observations:
  - 27.1 The river had not historically breached in this location and previous floods are known to not have affected the Huts,
  - 27.2 The equal likelihood of a breach on each side of the river,
  - 27.3 The high likelihood of a breakout upstream at the bridge crossings (SH1 and/or rail bridge),
  - 27.4 With 14km of stopbank downstream of State Highway One (7km each side), with two bridge crossings and several curves in the river, it is unclear why this location would be at a higher risk than the balance of the length of stopbank, and
  - 27.5 The ECan report states that the likelihood of this occurring is described as 'less likely'<sup>8</sup>, and 'a low probability outcome'<sup>9</sup>.
- 28 The key point here is that there is uncertainty in the robustness of the hazard assessment of the Waipopo Huts and in my view, the likelihood of a high hazard across the site is materially lower than that assessed by ECan.
- 29 While maintaining a prudent approach to flood hazard, I suggest that this uncertainty needs to be considered in light of the competing matters such as those raised in the evidence of Ms Stephenson regarding Kemps Deed and the history of this site, and duties of local authorities in relation to Te Tiriti.

#### MANAGING FLOOD HAZARD FOR THE WAIPOPO HUTS

30 The submitter has proposed the area is managed as two separate areas with different rules relating to flood hazard, see attached Map A at **Appendix C**. The area closest to the stopbank (Area A) and lower lying areas retain a form of existing use rights, but limited as to the ability to develop, with a smaller area

<sup>&</sup>lt;sup>8</sup> *"Timaru District recreational hut communities, overview assessment of flooding hazards",* Section 4.7.1, paragraph 3.

<sup>&</sup>lt;sup>9</sup> *Ibid.*, Section 4.7.2, paragraph 4.

(Area B) able to build modern homes, subject to compliance with finished floor level requirements.

- 31 I support this approach. The homes in Area A (closest to the stopbank) are at risk should the stopbank breach, however this is unlikely and a risk warning approach can be taken when the river rises in order to protect life.
- 32 For the houses in Area B, the proposed approach is appropriate and provides mitigation of the residual flood risk.

#### **SECTION 42 REPORT**

- 33 The Section 42A Officer's report broadly agrees with the Trust's submission to rezone their land to Māori Purpose Zone. The approach I have taken is to only address matters relevant to my area of expertise and provide comment on those matters.
- In review of the s42A Officer's Report, I note that Ms White considers ' *that it is appropriate to zone the 36 properties at Waipopo Huts MPZ,....*' (section 9.1.6).
  I agree with this conclusion in relation to flood hazard.
- 35 In section 9.2.17, Ms White also notes 'that consideration of how the natural hazard rules might affect this will be considered as part of the Natural Hazards topic but consider that no changes are required to the MPZ provisions in relation to these submission points'. I also agree with this conclusion.

### CONCLUSION

- 36 In summary:
  - 36.1 The site is subject to flood hazard, however I am concerned that the likelihood of inundation is overstated by the ECan assessments.
  - 36.2 However, it is appropriate to take a prudent approach to management of the flood risk in this location due to the proximity of the stopbank, and the influence of climate change in the future.
  - 36.3 As such, the proposed approach of limiting development closest to the stopbank (Area A) by a form of existing use rights is appropriate, with more permissive rules allowing re-development of buildings with a

minimum floor level in those properties outside the area subject to inundation of a stopbank breach (Area B).

37 Thank you for the opportunity to present my evidence.

# **Robert Kerr**

23 January 2025