Under	the Resource Management Act 1991
In the matter of	applications: • LR-2026-113441-00 • LV-2026-113442-00 • LL-2026-113443-00 • WS-2026-113444-00 • DW-2026-113686-00 • DL-2026-113687-00
And	**Gisborne District Council (Rivers and Land Drainage)** Applicant
And	**Gisborne District Council** Consent Authority

Statement of evidence of Cristian Fernando Hadad Westphal

Date: 22/09/2026

Statement of evidence of Cristian Fernando Hadad Westphal

Introduction

1 My full name is Cristian Fernando Hadad Westphal.

2 I am currently employed as a Principal Civil Water Resources Engineer at Stantec New Zealand Limited in Petone and have been with Stantec for more than 2 years, including in Principal Dam and Hydro Engineer and Principal Civil Water Resources Engineer roles. Prior to joining Stantec, I was a Senior Water Resources Engineer with Damwatch Engineering Limited, specialising in flood risk and hazard assessment, consequence assessment and engineering hydrology.

3 I hold Civil Engineering qualifications from the University of Chile, specialising in Hydraulics and Environmental Engineering, and am a member of Engineering New Zealand. I have over 17 years of experience in water resources engineering, principally in engineering hydrology, hydraulic modelling, river engineering, flood risk and flood protection, dams and hydropower. In my current role, I lead and review water resources assessments and designs and have acted as technical reviewer and Owner's Engineer on projects in New Zealand and internationally.

4 I have extensive experience in 1D and 2D flood modelling and consequence assessment acting as developer of the models and assessing the consequences, and leading and supervising the projects using DHI MIKE suite and HEC-RAS . Relevant examples include:

- Makara No. 4 Flood Detention Dam, Hawke's Bay, where I developed coupled 1D and 2D modelling using DHI MIKE Hydro and MIKE 21 FM and assessed flood hazards and incremental downstream consequences.
- Mangahao Power Scheme, Manawatū Whanganui, where I undertook 1D and 2D flood hazard and consequence modelling using the DHI MIKE modelling suite for 3 large dams, including failure scenarios
- Monowai River Scheme, Southland, including the development 1D and 2D DHI MIKE model to assess flood hazard and consequence assessment for 2 dams.
- Teviot River Scheme, Central Otago, including the development of a 1-D MIKE model, site inspection and flood hazard and consequence assessment for 3 dams and several cascade failure scenarios.
- Taylor Flood Detention Dam, where I led supervised the development of a HEC RAS hydraulic model and consequence assessment

- Tongariro Scheme Dam Breach Flood Modelling, where I led and supervised the development of a HEC RAS hydraulic model of dam breach scenarios.

5 I have undertaken and reviewed hydrological and hydraulic assessments of flood management and dam infrastructure, including flood hydrology and capacity assessments for Mangatikotoko Flood Detention Dam, 5 flood detention dams for Hastings District Council and 13 flood detention dams for Horizons Regional Council. My experience also includes independent review of hydrology, hydraulics and flood capacity for the Turitea Dams, Teviot River Scheme, Dannevirke Water Supply Reservoir among other assets.

6 My river engineering experience includes bridge hydraulics, scour and erosion protection, including Wairongomai, Dartmoor and Moeangiangi Bridges, where my roles have included flood hydrology, assessment of general and local scour, and design or review of scour and bank protection measures.

7 I acknowledge that I have read and am familiar with the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court Practice Note 2023, and agree to comply with it.

8 My qualifications as an expert are set out above. Other than where I state that I am relying on the advice on another person, I confirm that the issues addressed in this statement are 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.

Scope of evidence

9 My evidence addresses the following flood risk, hydraulic and river engineering matters:

(a) river aggradation and accretion, including implications for long term stopbank performance and freeboard;

(b) hydraulic and structural effects at the Rangatira Road and Kanakanaia Road bridges, including scour, debris blockage and matters to be addressed during detailed design;

(c) the completeness of the assessment of affected properties and the hydraulic characteristics relevant to productive land; and

(d) residual flood risk, including overtopping and breach considerations.

10 In forming my opinions, I have reviewed the application material, responses to requests for further information, submissions, the Section 42A report and the subsequent expert evidence. I have also relied on information provided by other technical specialists where matters fall outside my area of expertise. The principal documents relevant to my evidence include:

(a) the Consequential Flood Risk Assessment and associated hydraulic modelling information;

(b) the geomorphological assessments addressing river bed aggradation and berm and floodplain accretion;

(c) the preliminary bridge hydraulic, scour and structural assessments;

(d) the applicant's flooding evidence and associated technical attachments; and

(e) my previous technical reviews undertaken on behalf of Council during the consent and submission review process.

11 In the sections that follow, I respond primarily to the applicant's subsequent expert evidence and associated technical attachments. Where I state that I agree or disagree with a matter, this should be read as my response to the relevant opinion or conclusion expressed in that evidence, unless I state otherwise.

River Aggradation, Accretion and Long Term Design Performance

12 I agree that aggradation and accretion do not necessarily invalidate the assessment of incremental flooding effects, provided baseline and proposed conditions are compared on a common basis.

13 However, aggradation remains relevant to long term design performance. The geomorphic evidence indicates potential channel accretion of approximately 0.30 m to 1.20 m over the next 50 years, together with potentially greater floodplain accretion.

14 The evidence confirms that a +1.0 m riverbed sensitivity scenario was considered during the optioneering stage. However, it does not establish how future aggradation has been accommodated in the final design, or whether the adopted 600 mm freeboard is additional to, or inclusive of, any allowance for aggradation.

15 Given that sensitivity to aggradation was considered relevant during optioneering, I would have expected this sensitivity to also inform the final design assessment, particularly in relation to design flood levels and

residual freeboard. The hydraulic response cannot be inferred directly from the nominal aggradation value, as it will depend on resulting changes in channel and floodplain geometry, conveyance and flow distribution

16 Consistent with Stantec's earlier review, I consider that this uncertainty could be addressed through monitoring and adaptive management consent conditions, with appropriate performance and intervention triggers.

Hydraulic effects and debris blockage on bridges and impact on inundation areas and freeboard

17 The applicant was previously requested to clarify whether debris blockage at the bridges had been represented in the hydraulic modelling and what effect this could have on flood levels and the adopted 600 mm freeboard. The subsequent bridge assessment confirms that debris loading was not assessed and notes that debris could represent a more critical load case. I therefore consider this matter remains outstanding. In particular, the potential effect of debris blockage on upstream design water levels and residual freeboard has not been demonstrated. Given its direct relevance to stopbank design levels and performance, I consider this should be addressed rather than assumed to be accommodated within the 600 mm freeboard

18 I consider this matter should preferably be addressed before the hearing. If this is not practicable, I recommend that it be addressed through an appropriate consent condition requiring assessment of credible debris blockage scenarios during detailed design, including implications for design flood levels and freeboard, and implementation of any design changes or mitigation identified as necessary.

Bridge Scour, Structural Capacity and Detailed Design

19 During my earlier review, I was advised that detailed bridge scour and foundation assessments would be undertaken during detailed design. On that basis, I considered it reasonable for these matters to be deferred beyond the consent assessment stage.

20 The subsequent evidence identifies increased scour and structural demands at both bridges and confirms that further assessment is required to establish overall bridge capacity and any strengthening or remediation requirements. However, I have not identified a clear mechanism in the evidence for ensuring that these further assessments, and any resulting mitigation, are completed as part of detailed design

21 Consistent with Stantec's previous review, I recommend a consent condition requiring the relevant bridge scour, foundation and structural assessments to be completed during detailed design and submitted to Council's regulatory team for review, together with details of any mitigation or strengthening required to address effects attributable to the proposed stopbank upgrade.

Completeness of Identification of Affected Properties and Buildings

22 The applicant has confirmed that all affected properties and buildings were identified through the CFRA using available property and building information and hydraulic modelling results, with additional checks undertaken by Council officers. The evidence also addresses the previously omitted dwelling at 76 Whatatutu Road.

23 On this basis, I consider my previous concern regarding identification of affected properties and buildings to be adequately addressed. This conclusion relates to identification of affected properties and buildings and does not imply that all potential effects on productive land or other individual assets have been assessed

Flooding effects on productive land

24 The evidence provides additional information on flood depths, velocities and hazard at affected properties, but does not fully address the previously identified uncertainty regarding changes in the frequency and duration of inundation of productive land. In my opinion, these are relevant hydraulic characteristics because the consequences of flooding to productive land may depend not only on maximum depth or velocity, but also on how often inundation occurs and how long it persists.

25 This issue is reflected in several submissions. Burgess submission describes previous flood damage to a commercial citrus orchard and raises concerns regarding increased velocity, inundation and effects on ongoing orchard viability. The Kenneth and Karen McLanachan submission raises concerns about productive grazing land becoming flood prone and the loss of higher ground currently used to manage stock during flood events. Wi Pere Trust similarly identifies productive land that would become exposed to flooding at lower river levels than under the existing arrangement

26 From a hydrology and hydraulics perspective, I consider that there remains uncertainty regarding the baseline flood regime and the incremental change caused by the proposal, particularly in terms of flood frequency and duration

on productive land. This limits the hydraulic information available to characterise the change experienced by affected landowners.

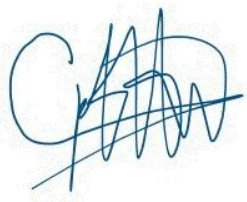
27 I am not an expert in agricultural productivity, property valuation or compensation, and therefore do not express an opinion on the resulting effects on farming or horticultural productivity, property value, or any compensation that may be appropriate. Those matters should be considered by appropriately qualified specialists using the available hydraulic information.

Residual Flood Risk, Overtopping and Breach

28 The applicant has assessed an overdesign flood event and therefore provides information on residual flooding consequences beyond the design event. However, the specific matters previously raised regarding potential overtopping locations, breach initiation and progression, and the associated flood consequences do not appear to have been assessed in the new evidence.

29 In my opinion, this leaves uncertainty regarding how the stopbank system may fail and the consequences of such failure. This matter is particularly important giving the relatively low combination of design event and freeboard. I recommend that these matters are addressed through appropriate requirements for detailed design and emergency management, including identification of potential overtopping and breach locations and consideration of the resulting flood pathways and consequences.

Dated 22 September 2026



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