

Before Gisborne District Council

Under the Resource Management Act 1991 (the **RMA**)

In the matter of applications by Gisborne District Council for resource consents to modify a stopbank at Te Karaka

Statement of evidence of Dean Foote on behalf of Gisborne District Council (Rivers and Land Drainage)

Project Management

7 September 2026

MC.

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1 Executive summary

- 1.1 My evidence addresses a number of matters arising from my involvement, including the proposed flood gates and culvert works, aspects of the hydraulic modelling and its assumptions, the effects of the proposed stopbank alignment on productive land and individual properties, and matters raised by submitters.
- 1.2 The proposed stopbank upgrade will provide a substantial improvement in flood protection for Te Karaka township. The flood gates proposed as part of the double culvert extension are an important component of that protection because they will prevent floodwaters from backwatering through the culverts and travelling along the State Highway towards the township during a sufficiently large flood event. The gates would only be required to operate during a major event, approximately of the scale of Cyclone Gabrielle or greater.
- 1.3 The hydraulic modelling underpinning the project has been calibrated against surveyed flood-level information collected following Cyclone Gabrielle, including surveyed flood levels and debris lines, and that calibration has subsequently been independently peer reviewed. The modelling also represents the Rangatira Road and Kanakanaia Road bridges and the hydraulic losses associated with those structures.
- 1.4 I acknowledge that there are uncertainties associated with flood frequency, future river conditions and the estimated peak discharges of historical flood events. In particular, the available estimates indicate that the peak discharges of Cyclone Bola and Cyclone Gabrielle were of a similar order of magnitude. The difference in observed flood levels between those events therefore cannot simply be attributed to a greater peak discharge during Cyclone Gabrielle. Changes in the river system, including aggradation, may also have contributed, although the available information does not allow that contribution to be quantified.
- 1.5 The proposed design includes 0.6 metres of freeboard. There is no statutory requirement to design flood protection infrastructure to a particular level of service, and future aggradation has not been separately added to the 0.6-metre freeboard. The 0.6-metre freeboard is stipulated by the project's funding agreement and reflects the balance between providing a significantly improved level of protection and delivering the project within the available funding envelope.
- 1.6 The proposal will have some localised adverse effects. In particular, the productive land between the existing and proposed stopbank alignments will experience more frequent inundation, with the assessment indicating a change from approximately a 1-in-40-year event to approximately a 1-in-5-year event. This is a consequence of the proposed retreat of the stopbank and is distinct

from the floodable berms adjacent to the township, which are already outside the protection provided by the existing stopbank.

- 1.7 In relation to the submitter properties, the modelling indicates that the lower-lying parts of Mr Moran's property will be flooded in the Design Event, but the upper terrace on which the dwelling is located remains approximately 2.3 metres above the modelled flood level, even after the stopbank upgrade. The lower terrace is already subject to substantial flooding in the pre-upgrade modelling.
- 1.8 At the Burgess Family Trust property, the proposed alignment was amended before notification to avoid buildings on the neighbouring property. The amended alignment also provides benefits in relation to the property's evacuation route during a large flood event and brings the affected land within the area being considered for acquisition under the Public Works Act. Matters such as access, dust and drainage can be addressed through the detailed construction arrangements and consent conditions where appropriate.
- 1.9 A number of construction and access concerns raised by other submitters can similarly be addressed through refinement of the construction methodology. For example, at the Pine Hollow Family Trust property, the haul road can be located on top of the stopbank near the buildings and, in the north of the property, on top of and on the riverside of the proposed stopbank to reduce effects on productive land. At the MacLanahan property, I agree that the haul road should not be located on the protected side of the new stopbank.
- 1.10 Overall, my evidence is that the proposed works provide a significant improvement in flood protection for the Te Karaka township, while the principal adverse effects identified for individual properties and productive land are understood and can be addressed through the proposed design, property processes, and construction and consent arrangements.
- 1.11 I rely on the detailed evidence of the relevant technical specialists for the specialist matters within their respective areas of expertise. My role has been to coordinate and oversee those inputs and to consider how the technical, property and construction aspects of the project come together in delivering the proposed works.

2 Introduction

- 2.1 My full name is Dean Richard Foote. I am employed by Gisborne District Council (GDC) as a Project Management Engineer.
- 2.2 This evidence is presented in respect of the Applicant, Gisborne District Council (Rivers and Land Drainage) ("the Applicant") of its application for resource consents to modify the stopbanks around Te Karaka (the **Stopbank Proposal**). My evidence addresses matters arising from my involvement in the project and, where relevant, information and technical assessments prepared by other members of the project team and specialist consultants.

3 Qualifications and experience

- 3.1 I hold the qualification of a BE (Hons) (Nat Res) from the University of Canterbury.
- 3.2 I have six years experience working in geotechnical, civil, project and river engineering.
- 3.3 I am employed by Gisborne District Council as a Project Management Engineer and have responsibility for project management aspects of the Te Karaka Flood Resilience Project.
- 3.4 I have been directly involved in the development and delivery of the Te Karaka Stopbank Proposal since joining GDC in March 2025. My role has included coordinating the project team, overseeing the progression of the technical investigations and design, and supporting the consenting and implementation processes.

4 Code of conduct

- 4.1 I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.

5 Scope of evidence

- 5.1 In my evidence, I will address the following:
 - (a) the role of the flood gates and the proposed culvert works;
 - (b) hydraulic modelling assumptions covering aggradation, bridge and debris considerations, as referenced in the Model Build report and the Peer Review memo;
 - (c) changes in flooding of productive land and individual properties;
 - (d) property-specific and construction matters raised by submitters.

6 Involvement with the Stopbank Proposal

- 6.1 I joined GDC in March 2025 to take over project management of the Te Karaka Stopbank Proposal. At that time, the hydraulic model had been developed and the calibration had been subject to peer review, and the optioneering process was underway.
- 6.2 Since that time, I have been involved in coordinating the project and its various technical, property, consenting and implementation workstreams. This has included coordinating inputs from the specialist consultants engaged by GDC, supporting the development and refinement of the preferred option, and overseeing the progression of the project through consenting and design.

- 6.3 My role has therefore involved working with the technical information prepared by the project specialists rather than personally undertaking all of the specialist technical assessments. Where I rely on specialist work in this evidence, I identify that reliance and do not intend to repeat the detailed technical evidence of the relevant specialist.

7 Response to Issues Arising out of Consent Review

Flood Gates on the Double Culvert Extension

- 7.1 The flood gates are proposed on the double culvert extension to prevent floodwaters from backwatering through the culverts and flowing along the State Highway towards the Cliff Road intersection and the township.
- 7.2 The flood gates would be required to operate only during a large flood event, of approximately the scale of Cyclone Gabrielle or greater.
- 7.3 The proposed stopbank upgrade would provide a substantial improvement in protection to the township even without the flood gates. However, without the flood gates, there would remain a pathway for surface flooding through the culvert system towards the township during a sufficiently large flood event.

Aggradation Scenario

- 7.4 Aggradation was modelled during the optioneering phase to compare how the different options would accommodate future aggradation.
- 7.5 There is no statutory requirement to design flood protection infrastructure to a certain level of service and aggradation has not been individually factored into the 0.6m freeboard of the final design.
- 7.6 The 0.6m freeboard is stipulated in the agreement with the project funders - National Infrastructure Finance and Funding (NIFF). This upgrade represents a significantly improved level of protection while aiming to retain affordability under the available funding envelope.

Modelling of Woody Debris on the Bridges

- 7.7 The hydraulic model represents the Rangatira Road and Kanakanaia Road bridges, including their deck and soffit levels and the hydraulic losses associated with the bridge structures. Different bridge-related hydraulic conditions were tested during the model calibration process. The calibration process was subsequently subject to independent peer review.
- 7.8 Information available from Cyclone Gabrielle, including GDC video footage (available upon request) of the bridges during high flows, indicates that there was not a significant accumulation of woody debris on the bridges during that event.
- 7.9 In the Design Event, the modelled flood level is above the decks of both bridges in both the pre-upgrade and post-upgrade scenarios. In my view, this reduces the potential for additional blockage of the bridge decks by woody debris to materially affect the modelled flood levels for an event of this magnitude.

- 7.10 Rangatira Bridge is located on a unconstrained section of the floodplain which provides a wide flow path and bypass for floodwaters. In my view, this further limits the likelihood that debris blockage will cause increased flood depths upstream.
- 7.11 While woody debris was observed on the Whatatutu Road bridge during Cyclone Gabrielle, the modelled flood depth for the Design Event is approximately 2.6 m above the deck of the Whatatutu Road bridge and as such debris blockage is in my opinion, unlikely to materially impact the modelled flood depths.

Flood Frequency for Productive Land

- 7.12 The proposed stopbank upgrade does not change the frequency of flooding of the floodable berms adjacent to the township that are already outside the protection provided by the existing stopbank. These areas are already inundated before floodwaters interact with the section of stopbank proposed to be modified.
- 7.13 In contrast, the productive land that would be affected by the proposed stopbank retreat, being the land between the existing and proposed stopbank alignments, would experience an increase in flood frequency. The assessment estimates that the frequency of inundation of this land would change from approximately a 1-in-40-year event to approximately a 1-in-5-year event.

Peak Discharge of Cyclone Bola vs Cyclone Gabrielle

- 7.14 The estimated peak discharges for Cyclone Bola and Cyclone Gabrielle are subject to significant uncertainty. The available estimates place the peak discharge for Cyclone Gabrielle in the order of 4,000–4,500 m³/s and the peak discharge for Cyclone Bola at approximately 4,500 m³/s. On that basis, the estimated peak discharges for the two events are of a similar order of magnitude.
- 7.15 The difference in observed flood levels between the two events therefore cannot be attributed simply to a materially greater peak discharge during Cyclone Gabrielle. The available technical evidence indicates that changes in the river system, including aggradation, may also have contributed to differences in flood levels. However, given the uncertainty in the estimated flows and the other factors affecting flood levels, I understand that it is not possible to quantify the contribution of aggradation.

8 Submitter Concerns

Response to Submissions by Daniel Moran

- 8.1 Before addressing the specific matters raised by Mr Moran, it is important to clarify the nature of the flooding effects of the proposed Stopbank Proposal at his property. Mr Moran's submission expresses concern that the proposed works will impose additional flood risk on his property, including the potential for the property to become newly flooded. The modelling does indicate that flooding will occur on the lower-lying parts of the property in the Design Event; however, this is distinct from flooding of the upper terrace on which the dwelling is located.

- 8.2 The post-upgrade modelling for the Design Event indicates that the upper terrace at the property is approximately 2.3 m above the modelled flood level. This provides substantial freeboard between the modelled Design Event flood level and the upper terrace. The modelling indicates that flooding of lower-lying parts of the property and the wider Te Karaka township will occur before floodwaters reach the upper terrace, even with the proposed stopbank upgrade in place.
- 8.3 In response to the submitter's comments regarding "back-modelling" and the use of "geological floodplain data", the hydraulic model was calibrated using surveyed flood-level information collected following Cyclone Gabrielle. The calibration was subsequently independently peer reviewed. The DHI model-build report records the use of surveyed flood levels and debris lines and the comparison of modelled and observed Cyclone Gabrielle flood levels.
- 8.4 The flood hazard information generated through the CFRA may be relevant to any future consideration of flood hazard overlays in the Tairāwhiti Resource Management Plan. Any such changes would, however, be subject to the applicable statutory planning process and are separate from the present consent application. The over-design event information referred to in the modelling should not be understood as itself amending the District Plan.
- 8.5 The Applicant has considered changes in flood depth as well as changes in flood hazard classification in relation to the submitter's property. The upper terrace has substantial freeboard in the Design Event, while the lower terrace is already subject to substantial flooding in the pre-upgrade Design Event modelling.

Response to submission by Burgess Family Trust

- 8.6 The Burgess Family Trust owns the property at 2416 Matawai Road at the eastern end of the proposed stopbank works. The property contains an established commercial citrus orchard and was significantly affected by flooding during Cyclone Gabrielle. The submitters support the wider rationale for the Te Karaka Flood Resilience Project, but have raised concerns regarding the effects of the proposal on their property and orchard operation. These concerns principally relate to the revised stopbank alignment crossing part of their property and main access, construction effects on the orchard, and the modelled increase in velocity across parts of the property.
- 8.7 The alignment was amended prior to notification of the consent to avoid buildings on the neighbouring property that were directly affected by the earlier alignment. However, the amendment also provided benefits in relation to the property's evacuation route during a large flood event and brought the affected land within the area being considered under the Public Works Act. These reasons were also given when the alignment change was first discussed with the property owners.
- 8.8 The amended alignment was to be progressed for the purposes of informing property valuations, with the landowners retaining the opportunity to consider the implications of the proposed access arrangements and compensation.
- 8.9 Other matters raised by the submitters, including dust, access and drainage, are matters that can be addressed through the consent conditions and the land access arrangements for the works, as applicable.

Response to submission by Jacqueline Hema

- 8.10 The submitter has raised concerns that the stopbank upgrade may limit access for horse trekking. At this location, the proposed stopbank terminates into higher ground and is approximately 1 m high at its highest point, tapering to ground level. No additional fencing is proposed in this area as part of the stopbank works. On that basis, I do not consider that the proposed stopbank itself would prevent access for horse trekking at this location.

Response to submission by Pine Hollow Family Trust

- 8.11 This submitter has raised concerns around the location of the haul roads outlined within the consent application.
- 8.12 In the southeast of the submitters property near the house and buildings, the haul road can be limited to on top of the stopbank. This will minimise the potential impact on the nearby buildings as requested by the submitter.
- 8.13 In the north of the property, the haul road can be limited to on top of the proposed stopbank and to the riverside of the proposed stopbank location, thus limiting impact on the submitters productive land.
- 8.14 However, in the east of the property (but in areas away from the buildings) a haul road is required on top of the new stopbank as well as on the protected side of the proposed stopbank. This is critical to allow plant to operate in both directions during construction.

Response to submission by Kenneth & Karen MacLanahan

- 8.15 I agree with the submitters request that the haul road should not run on the protected side of the proposed new stopbank. The haul road will be limited to on top of the stopbank and on the riverside of the proposed new stopbank for this location.
- 8.16 The potential to use the southwestern area of the property for soil borrow instead of the northern area will be investigated through detailed design. The viability of this option will depend on the change in flood effects, the nature and volume of the material in this location.
- 8.17 The submitter has raised the need to have protected land available for relocating stock if a flood event comes into the forecast. The design retains approximately 1.4ha of grazing land on the protected side of the stopbank for stock. Sheep are also able to be grazed on the stopbank itself, although the grazing of other stock (horses, cows and pigs) is not supported on the stopbank due to the risk of damaging the stopbank and causing a breach.



Figure 1: Approximate areas on the submitters property which will be a suitable refuge for stock during a flood event.

9 Conclusion

- 9.1 I consider that the proposed Stopbank Proposal will provide a significant improvement in flood protection for Te Karaka township. The proposal has been informed by hydraulic modelling that has been calibrated against observed Cyclone Gabrielle flood information and independently peer reviewed. The proposed flood gates, stopbank alignment and associated works form an integrated package intended to improve the resilience of the township during major flood events.
- 9.2 I acknowledge that the proposal will result in some localised adverse effects, including increased inundation of some productive land and effects on individual properties during construction and operation. However, these effects are understood and can be appropriately managed through the proposed design, property acquisition and compensation processes, and detailed construction and consent arrangements.
- 9.3 Overall, having regard to my involvement in the project and the matters addressed in my evidence, I support the proposed works and consider that they represent an appropriate and practicable response to the flood risk facing Te Karaka township.

Dean Foote

14 September 2026