

**BEFORE THE INDEPENDENT HEARING COMMISSIONER APPOINTED BY  
THE WEST COAST REGIONAL COUNCIL**

**UNDER** the Resource Management Act 1991 (RMA)  
**IN THE MATTER** of an application for resource consent under section 88 of  
the RMA by the West Coast Regional Council for  
stopbanks in the Waiho River

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**STATEMENT OF EVIDENCE OF BEN PASCO ON BEHALF OF THE WEST  
COAST REGIONAL COUNCIL (AS APPLICANT)**  
12 July 2023

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**WYNN WILLIAMS**

## **Introduction, qualifications and experience**

- 1 My name is Ben Neil Pasco.
- 2 I am a Project Manager at Tetra Tech Coffey and have 15 years' experience in water resources engineering and construction management. Prior to joining Tetra Tech Coffey I was an Engineer at Good Earth Matters Consulting for 9 years. I have been involved in river management throughout my working career as Engineer's Representative, site engineer, and project manager for projects including stopbank construction, rock lining, and emergency works principally on projects and secondments for Environment Canterbury (Waimakariri Flood Protection Project, and South Canterbury Flood response) and also bank stabilisation and dredging projects for Christchurch City Council.
- 3 I hold a Bachelor of Engineering (Natural Resources) from the University of Canterbury. I am a chartered member of Engineering New Zealand (CMEng).
- 4 I have been asked by the West Coast Regional Council (**Council**) to provide independent expert evidence on its application for resource consent to in relation to stopbanks in the Waiho River. I have been involved in the proposal since October 2022 acting as local support for Dr Dai Thomas' continued involvement, and to advise on construction related impacts, temporary works requirements, and river management in support of affected party consultation and project consenting. I have visited the site for the purposes of this project 4 times to date and am familiar with the surrounding location.
- 5 Although this evidence is prepared for a Council hearing, I have read the code of conduct for expert witnesses contained within the Environment Court Practice Note 2023 and agree to comply with it. Except where I state that I am relying on the specified evidence of another person, my evidence in this statement is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

## **Scope of evidence**

- 6 My evidence addresses the following matters:

- (a) A description of the proposal, including in respect of the stopbank design based on the modelling information;
- (b) An assessment of the proposed construction methodology and proposed management of temporary impacts.

7 In preparing this evidence, I have reviewed and relied on the following:

- (a) Application for resource consent for the use of land to construct stop banks in the Waiho River by the West Coast Regional Council dated 20 March 2022 (**Application**);
- (b) Several requests for further information and subsequent responses in relation to the Application;
- (c) Design drawings and design report by Tetra Tech Coffey and Land River Sea Consulting respectively.
- (d) West Coast Regional Council - Rock Supply & Stopbank Construction Panel, Request for Proposal (RFP) V2 dated 19 January 2022.
- (e) The evidence of Matthew Gardner;
- (f) The evidence of Dr Dai Thomas;
- (g) Relevant parts of the section 42A report prepared by Selene Kane dated 5 July 2023.

### **Executive summary**

- 8 I have been involved in the construction planning and provision of details regarding temporary works to interested parties, and in support of ancillary consent applications (temporary works).
- 9 The proposed physical works comprise the raising of existing portions of rock-lined stopbank by typically 2m in height, and construction of a new section of stopbank downstream of the Heliport Stopbank. A figure setting out this layout is included in the evidence of Dr Thomas.
- 10 The proposed stopbank works are consistent with flood protection structures already present along the construction corridor.
- 11 Raising sections of the existing stopbanks will require construction on the landward (north) side of the existing banks, necessitating vegetation

clearance and bulk fill to increase the overall width of the bank without narrowing the existing river channel.

- 12 The design has sought to avoid construction on any private property. Local adjustments to bank batter slopes (up to 2 horizontal to 1 vertical) will be made to ensure this is achieved whilst maintaining slope stability. Other than where adjustments have been made to avoid construction on private property, the design landward slope is primarily 3 horizontal to 1 vertical.
- 13 Approximately 210,000m<sup>3</sup> of bulk fill gravel is required to form the raised and new sections of stopbank.
- 14 Bulk fill will be sourced from the adjacent Waiho River where the riverbed is rapidly aggrading at an historic average of 180mm per year (Land River Sea, October 2021). The riverbed area between the State Highway 6 bridge and the Waiho Loop where gravel may be sourced for this project is approximately 300 hectares, equating to 540,000m<sup>3</sup> of gravel deposited annually.
- 15 While there is more than enough gravel for the proposed works, extraction locations will need to be managed appropriately (in terms of location and orientation) to ensure there are no adverse effects on the existing flood protection structures.
- 16 The works will be sequenced so as to minimise the extent of open excavations (particularly for toe rock placement) and enable securing of work sites at river level when flood events necessitate. Work to raise the stop bank will be able to largely continue irrespective of river levels.
- 17 The works will be managed in accordance with a Contract Management Plan as per typical requirements for this type of construction project including worksite health and safety provisions, and stakeholder, neighbour, and traffic management.

#### **Update on works currently occurring**

- 18 Works subject to this resource consent application have commenced on site, under the emergency works provisions of the Resource Management Act 1991.
- 19 The works will proceed on a staged basis, with work having commenced first on the section of new stopbank immediately downstream of the

heliport. Work on the Heliport section of bank is also to be prioritised during the winter 'low' season for tourist and helicopter activity.

- 20 I understand that works on the new section of stopbank began on 19 June 2023, with the construction starting at the connection to the Heliport section of bank and working downstream. This section of the project involves the construction of 930 metres of new gravel stopbank lined on the river side with rock, two metres thick.
- 21 I understand from the contractor that to date, 200 metres of this wall has been constructed from river gravel to a height approximately four metres below the finished height. 200 metres of the toe trench and batter has been completed to the design depth and grade, in preparation for rock placement.
- 22 Buried rock placement is anticipated to commence from 10 July 2023.

#### **Description of the stopbank design based on modelling**

- 23 The stopbank design comprises raising of portions of existing bank by typically 2m and construction of a new 900m long section of stopbank downstream of the Heliport Stopbank.
- 24 The stopbank will be rock lined on the river side in all locations. This rock will be sourced from local quarries of appropriate quality and size.
- 25 The new/raised stopbank has been designed to convey a 2,500 m<sup>3</sup>/s flow with allowance for estimated channel aggradation over the next 20 years.

#### **Description of the proposed works**

- 26 The entire programme of works is anticipated to take place over twelve months. The works are expected to begin with the construction of the 900m long section of new stopbank downstream of the Heliport Stopbank. This will initially be constructed to the same level as the existing banks upstream (Church and Heliport Stopbanks) and Havill's Wall Stopbank downstream. This will strengthen what is currently the most vulnerable section of the true right bank between SH6 and the wastewater treatment plant.
- 27 The second stage of works is the raising of the existing and new stopbanks. The sequencing of stopbank raising portion of works is not

critical for flood risk management as the current stopbank crest is higher than the design flood flow with current (2021) riverbed levels.

- 28 Notwithstanding this, once the new stopbank is constructed (at the same height as the upstream and downstream stopbanks), it is anticipated that the raising work will commence from the upstream end at the SH6 bridge. Sequence adjustments will be made as required, particularly to mitigate impacts on the heliport operations during peak usage times and to coordinate with other infrastructure asset works required to facilitate the stopbank work.
- 29 Work in the bed of the river will be required during construction for site access, to extract gravel for bulk fill, and to place toe rock and foundations for the new section of stopbank.
- 30 Gravel extraction and temporary river diversions will be undertaken in accordance with separate resource consents for these activities. For completeness, a description of those works is also set out below.
- 31 Gravel extraction excavation will typically occur in the dry riverbed in the central third of the river, however, where appropriate, may occur outside the central third in wider parts of the river fan.
- 32 Orientation of excavations will be generally parallel to the adjacent stopbanks to reduce potential for any river flows to be directed towards existing stopbanks.
- 33 Gravel extraction locations will also be governed by locations of suitably graded gravels which meet the construction specification for bulk fill.
- 34 Temporary river diversions will be required to facilitate construction and gravel extraction activities in the bed of the river.
- 35 Temporary diversions will be located to utilise existing river braids (thereby minimising temporary works) and avoid adverse impacts, particularly on downstream flood protection structures.
- 36 A Contract Management Plan has been prepared by the contractor and will be monitored throughout the work by the Engineer to Contract, Engineer's Representative (WSP), Tetra Tech Coffey and Council staff.

#### **Section 42A report**

- 37 I have read the portions of the section 42A report relevant to my evidence. I note that paragraph 50 of the section 42A report states "if

consent is granted the new stopbank should be designed and constructed to a level at which the potential is reduced". I can confirm that the stopbank has been designed and will be constructed to meet this requirement (consistent with the design parameters described in my evidence and the evidence of Dr Thomas).

### **Condition of Existing Stopbanks**

38 It may be necessary to address the condition of the existing stopbanks prior to undertaking additional works. Where required, this will address rock lining embedment and thickness.

39 Based on my previous experience observing gravel stopbank construction, the materials used to construct the Havill Wall and the Church Stopbank are sound, have undergone several years of self-settlement to compensate for less than optimal mechanical compaction, and the proposed bank will be stable under static conditions at the designed slopes.

40 In the event that sections of the existing stopbanks are poorly compacted, some minor settlement of the material may occur. In my opinion, any settlement that would occur through this process would not adversely affect the performance or stability of the stopbanks once the proposed works are completed. An inspection and maintenance schedule would be expected for all flood protection assets and would identify any remediation works required.

### **Minor alignment change**

41 Since lodging the application, a minor change to the alignment has been proposed. This change relates to where the new stopbank ties into the existing Havill Wall. The effect of the change is to move the works further away from the boundary of the Scenic Hotel Group Ltd (**SHGL**) property achieving approximately 10m separation between the landward toe of the bank and the boundary of the SHGL property. This provides a roading corridor between the SHGL property and the stopbank, as an alternative to the road along the top of the stopbank.

42 A plan representing the change in alignment is attached to my evidence as **Appendix 1**.

- 43 This change does not alter the shape of the bank, and is in a wide part of the river. For this reason, the change will not impact the previous flood modelling undertaken.



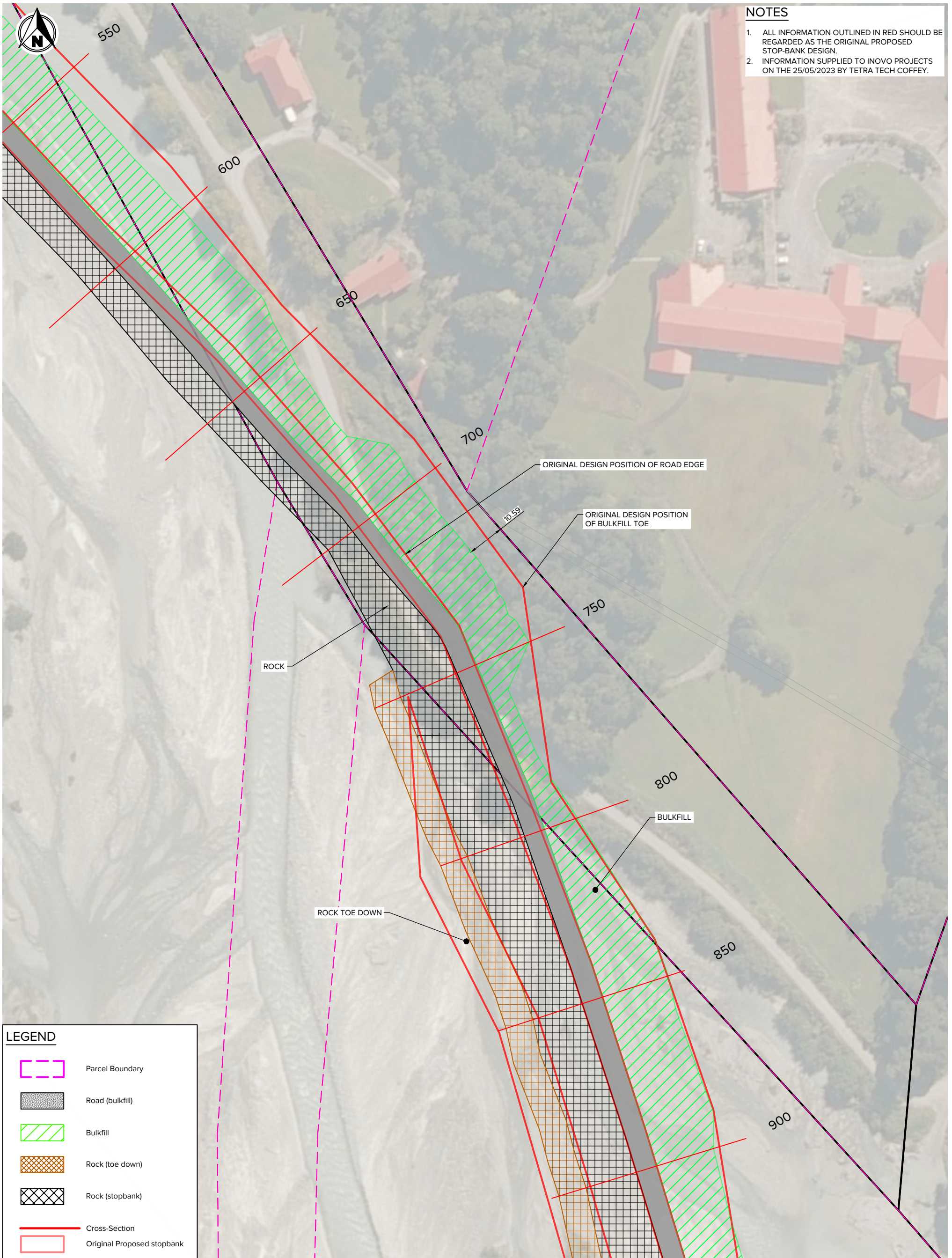
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**Ben Pasco**

**12 July 2023**



## Appendix 1: Plan showing minor re-alignment

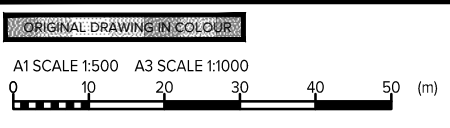


**NOTES**

1. ALL INFORMATION OUTLINED IN RED SHOULD BE REGARDED AS THE ORIGINAL PROPOSED STOP-BANK DESIGN.
2. INFORMATION SUPPLIED TO INOVO PROJECTS ON THE 25/05/2023 BY TETRA TECH COFFEY.

**LEGEND**

	Parcel Boundary
	Road (bulkfill)
	Bulkfill
	Rock (toe down)
	Rock (stopbank)
	Cross-Section
	Original Proposed stopbank



Project: **FRANZ JOSEF STOPBANKS** Drawing Title: **ORGINIAL PROPOSED STOP VS PROPOSED STOP BANK**

Rev#	Description	Drawn	Date
A	ORIGINAL ISSUE	ADM	28.06.23

**INOVO PROJECTS**  
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 www.inovo.nz

Scale A1: 1:500  
 Scale A3: 1:1000  
 DO NOT SCALE FROM DRAWING

Designed: ADM  
 Approved: DR  
 Date: 28.06.23

Status: **CONSENT INFORMATION**  
**NOT FOR CONSTRUCTION**  
 Drawing No. **15408-SK-009** Rev **A**