

Our reference: A1313196  
File: RM19.387

14 January 2020

NZ Transport Agency  
PO Box 5245  
Dunedin **9058**

Via email to [shane.l.roberts@wsp.com](mailto:shane.l.roberts@wsp.com)

Dear Sir

**Clarification from further information response dated 20 December 2019 and request for further information under section 92(1) of the Resource Management Act 1991 (the Act) – Consent Number RM19.387.**

Thank you for your further information response dated 20 December 2019. There are aspects of the further information request that have not yet been addressed adequately. We require this information in order to determine what effects will result from the proposed activity which will impact on the notification decision.

**1. Engineering and Natural Hazards assessment**

There are two points related to the Engineering and Natural Hazards assessment that have not yet addressed adequately the further information request and further clarification of these matters is required. This is in regard to sections 5(iii) and 5(iv) of the consent application.

- 1.1 The effect of afflux due to debris raft formation on both the existing and new bridges has not been addressed satisfactorily. Please provide a quantitative assessment for both bridges of the additional afflux due to debris raft formation relative to the afflux induced by the bridge piers only.
- 1.2 The response provided addresses the technical review comments on freeboard of the proposed bridge, particularly whether a departure from the 1.2 metre minimum standard for the SLS flood has been sought from the applicant. The response provided advises that the applicant has approved a departure from this standard however no justification has been provided for why this departure is needed. Please provide this.

## **2. Visual assessment**

With regard to the visual assessment, the inclusion of the Urban and Landscape Design Framework document has been beneficial in understanding the design outcome for the proposal. The response however regarding the natural character or landscape effects of the river corridor has not been carried out adequately.

2.1 Provide clear descriptions of the receiving environment, including any relevant statutory analysis.

2.2 Provide a thorough natural character assessment as stated under Section 6(a) of the RMA. This assessment should include the commentary around the existing natural character condition stating the abiotic, biotic and experiential aspects of the Clutha River (its river channel, banks and local context). The assessment will also need to assess the effects of the proposal to the existing condition of natural character.

2.3 Outline recommendations around avoiding, remedying and mitigating potentially greater landscape, natural character and visual amenity effects.

2.4 Provide a clear analysis against relevant statutory instruments.

The application will remain on hold under Section 88C until this information is provided.

In addition to this, additional information is required on the following matters.

## **3. Discharges**

The letter provided seeks clarification on whether a discharge permit and a land use consent will be required. The inability to meet permitted rule 13.5.1.1 would require land use consent under rule 13.5.3.1 of the Regional Plan: Water. Typically, a discharge permit would not be issued as it is usually on remobilisation of sediment which does not require consent. However, if the banks are to be disturbed, a discharge permit would be required under this rule. In addition to this, if sediment is discharged from a source other than the bed is discharged, (e.g. gravel), a discharge permit would be required if permitted activity rule 12.C.1.1.

## **4. Defence against water**

The further information response indicates that the gravel bund will be created in the watercourse to allow access to Pier C. A defence against water is defined as:

Any dam, weir, bank, carriageway, groyne, or reservoir, and any structure or appliance of any kind which has or may have the effect of stopping, diverting, controlling, restricting, or otherwise regulating the flow or spread or subsidence, in or out of a water body, of water including flood waters, which is specifically established for the purpose of flood hazard mitigation.

The following rules in the Regional Plan: Water are applicable:

- 14.3.1.1 The alteration or reconstruction of any defence against water, other than on the bed of any lake or river, is a **permitted** activity providing:
  - (a) There is no permanent change to the scale, nature or function of the defence against water.
- 14.3.2.1 Except as provided for in Rule 14.3.1.1, the erection, placement, extension, alteration, replacement, reconstruction, demolition or removal, of any defence against water, other than on the bed of any lake or river, is a **discretionary** activity.

Please confirm whether you are seeking resource consent for a defence against water. Please note that we will not require any additional information on this matter simply confirmation whether consent is sought for this activity.

## 5. Visual assessment comment

5.1 Outline a clear methodology for assessing Landscape, Natural Character and Visual Amenity values and effects of the riverine environment, including ways to remedy, mitigate and avoid adverse effects. The methodology should set out clearly the effects rating scale, as well as descriptions around definitions.

5.2 Provide a landscape assessment and discussion on how the local riverine landscape change as a result of the proposal.

## 6. Hazards comment

Damwatch have reviewed the Section 92 response provided and noted that the response mostly addresses everything included in the request. However, there are some outstanding matters that need to be resolved before an assessment of effects can be made.

6.1 Please extend the 1-d hydraulic model a few kilometres downstream (cross-sections can be requested from Otago Regional Council if required) to ensure that the backwater profiles past the new and existing bridges are not influenced by the downstream boundary condition assumptions (i.e. the river cross-section and the energy slope – see Paragraph 2b(ii) of the Damwatch technical review appended to the Section 92 request). There appears to be a hydraulic control in the river downstream (see figure appended to this letter) which could potentially affect the backwater profiles upstream and hence the SLS and ULS design flood levels for the new bridge.

6.2 The 1-d hydraulic model was calibrated against measured flood level and discharge values for two flood events in January 1994 and December 1995 (2,700 and 3,250 m<sup>3</sup>/s respectively). These are not as large as the largest recorded flood in November 1999 but it is understood that there is a paucity of measured flood levels for this event.

The historic flood of 1878 was even larger than these recorded floods. Damwatch are aware of a measured flood level at the Beaumont Bridge site. This level and an estimate of the flood magnitude are given in a

2000 report on the flood history of the Clutha River prepared by Opus International Consultants (the predecessor of WSP Opus) for Contact Energy. Please arrange access to this data with Contact Energy to further inform the calibration of the 1-d HEC-RAS computational hydraulic model and provide greater confidence in the design flood level estimates for the new bridge<sup>1</sup>.

- 6.3 The Appendix 5C report provided in the consent application is focussed on providing input to the development of the design concept for the new bridge. The 1-d computational hydraulic model assumes vertical 'walls' along the river banks. It is important to understand whether the river banks confine the flood flows upstream of the new and existing bridges or whether the flood flows spill over the top of the banks onto the floodplains. Please provide illustrations of the backwater profiles for the SLS and ULS floods (Paragraph 2c of the Damwatch technical review appended to the Section 92 request) to show the line of the top of the bank on each side of the river to illustrate whether bank overtopping occurs in these floods. Also provide discussion on the matter.
- 6.4 The banks of the Clutha River are heavily lined with willow trees for which the hanging branches drag in the water as flood levels rise. The additional drag induced by the hanging branches will potentially increase the channel 'roughness' and thereby cause elevated flood levels as the flood discharge increases above the discharge for the highest calibration event. Test the sensitivity of the backwater profile predications of the HEC-RAS model for the SLS and ULS floods by increasing the Manning's n channel roughness calibration value by up to 0.005. Please provide illustrations of the backwater profiles for these floods relative to the backwater profiles for the Manning's n roughness calibration values.
- 6.5 The Section 92 response on floodplain effects indicates that the steep hillside on the left (east) bank upstream of the existing bridge will constrain floodwaters within the river channel from spreading laterally. However, due to the paucity of accurate ground level data, it is uncertain whether floodwaters will break out along the right (west) bank and spread laterally over farmland (it is noted that ground levels at the site of the hotel along State Highway 8 on the right bank exceed the SLS and ULS design flood levels at the proposed bridge). This response is insufficient to enable an assessment to be made on the backwater effects of the proposed new bridge on the right bank floodplain upstream of the existing bridge (the inside of a river channel bend is a typical breakout location for overland flow across a floodplain). Please provide further certainty on this matter by referencing aerial photographs of flood extents from the November 1999 flood event which may be available and undertaking a spot ground level survey of the right bank floodplain upstream of the existing bridge. Use this additional information to provide further comment on the likelihood of flood breakout and, if so, the extent of any flood inundation for the existing bridge only, the existing

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<sup>1</sup> The bed profile in this reach of the Clutha River appears to be controlled by rock outcropping so that the geomorphological form of the river channel is unlikely to have changed very much since the 1878 flood. It would therefore be reasonable to use the measured peak flood level from the 1878 flood and the estimated flood discharge to inform the calibration of the HEC-RAS model of the river channel.

and new bridges **without** debris rafts around the piers on both bridges, and the existing and new bridges **with** debris rafts around the piers on both bridges. The extents of any floodplain inundation should be illustrated by appropriate maps.

6.6 Provide clarification of the responsibilities of future management and maintenance of the existing bridge. Certainty that the existing bridge is going to be managed and maintained properly in the future is required so that the risk of failure/ collapse is adequately mitigated.

#### **7. GPS coordinates**

Provide GPS coordinates in NZTM 2000 format for the location where works are proposed, including but not limited to:

- Commencement and termination of bridge;
- Location where structures (weirs) in the watercourse are located; and
- Approximate location of where any defence against water (as discussed in Section 4) are proposed, if required.

This information is required in accordance with Section 92(1) of the Act. Please note that if point 1 and 2 are addressed prior to the remaining points of the letter, the application will be taken off hold as this is an additional information request. You are able to place the application on a time extension under Section 37(1) if you wish.

If you have any further queries, please contact me on (03) 474 0827 or 0800 474 082.

Yours sincerely



Rebecca Jackson  
**Consents Officer**

cc Shane Roberts, C/- WSP-Opus, Private Bag 1913, Dunedin 9054

**Appendix 1. Hydraulic control in Clutha River downstream of the existing  
Beaumont Bridge**

