

NIWA Project: WPL13501

11 December 2013

Westpower Ltd
PO Box 375
Greymouth

Attention: Sue Cotton

Dear Sue

Effects of proposed Waitaha HEP scheme on bed/channel stability

This letter responds to your request of 7 August 2013 for a comment as to whether the proposed Waitaha HEP scheme will cause any changes to the natural processes already occurring in the river with particular regard to bed/channel stability. My response is as follows. It is based on information presented in my June interim report¹ and observations made during my site visit on 22 February 2013.

1. The Waitaha channel at Kiwi Flat naturally exhibits considerable instability due to frequent large floods, high fluxes of bed-material, and transient deposition and re-working of sediment. This is evident from abandoned branches (typically perched above the existing channel), terraces and banks of deposited sand and gravel, armoured segments of bed and bank, and places where the channel margins are eroding (e.g., the true left bank immediately north of the Kiwi Flat hut). The proposed scheme will not alter this suite of natural processes and fluvial features, nor their frequencies of occurrence or physical characteristics.
2. Between Kiwi Flat and the proposed outfall site (~ 1 km upstream of Douglas Creek) the Waitaha River falls through Morgan Gorge (a slot bedrock plus large boulder gorge) then flows along a relatively steep 'rock garden' boulder-bed reach. The boulders in the latter reach are lag deposits of low mobility, even during floods. The bulk of the Waitaha's bedload here is finer material (cobbles, gravel and sand) that is generally supplied at rates less than the river's capacity to transport such material during floods, thus it generally overpasses the boulder-lined channel bed and the channel is relatively stable. Since the proposed project will have no significant effect on the discharge of water and bedload from Kiwi Flat during floods, it should also not affect channel processes, characteristics, and stability in the reach between the scheme's take and return points.

¹ Hicks, D. M. 2013. Sediment investigations relating to a proposed HEP scheme on the Waitaha River. NIWA Client Report CHC2013-063, prepared for Westpower Ltd, June 2013, 25 pp.

Yours sincerely

A handwritten signature in black ink, appearing to read 'D M Hicks'. The letters are cursive and fluidly connected.

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