

**Before the Hearing Commissioners appointed by Hawke's Bay Regional Council**

**In the matter** of the Resource Management Act 1991  
**(the Act)**

**And in the matter** of applications APP-123534, APP-123548, APP-123526, APP-123550, APP-123535 & APP-123536 by the Regional Assets Section, Hawke's Bay Regional Council to remove gravel and undertake other earthworks at various locations along the Ngaruroro River, Tukituki Catchment Rivers and Tutaekuri River to the coast

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**Statement of evidence of José Francisco Beyá**

**5 November 2021**

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LJB-003502-387-160-V2

## INTRODUCTION

### Qualifications and experience

- 1 My full name is José Francisco Beyá.
- 2 I am employed as an engineer at Hawke's Bay Regional Council specialising in Rivers and Coastal Engineering. I have held this position since January 2018. In that role I am responsible for coastal projects and river morphology/gravel management studies.
- 3 Prior to joining Hawke's Bay Regional Council, I was an Associate Professor at the Ocean Engineering School – Universidad de Valparaiso in Chile. There I lectured wave mechanics, maritime hydraulics and design of maritime structures, guided undergraduate thesis, directed and participated in R&D projects related to wave climate, and energy and carried out several consultancy projects involving a wide range of coastal engineering issues.
- 4 From 2003 to 2005, I worked as a Research Engineer in lake hydrodynamics and water quality at the CBER, University of Waikato, and then, as a Technical Rivers Engineer at the Waikato Regional Council, mostly undertaking flood modelling.
- 5 I am a Chartered Professional Engineer, Engineering New Zealand and an International Professional Engineer/APEC Engineer.
- 6 I hold the following degrees - a Bachelor of Civil Engineering, Universidad de Chile (2002), a Civil Engineering Major in Hydraulics, Environmental and Sanitary, Universidad de Chile (2003) and a Master of Engineering, University of New South Wales (2011).
- 7 I was a co-author of the Gravel Resource Management Report<sup>1</sup> together with Gary Clode, who was then the Regional Assets Manager at HBRC. This report was reviewed by technical reviewers Jon Tunnicliffe and Mark

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<sup>1</sup> September 2018  
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Dickson. Their comments are included at Appendix 2 of the Section 42A Report.

### **Expert witness Code of Conduct**

8 I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's Practice Note dated 1 December 2014. I have read and agreed to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

### **PURPOSE AND SCOPE OF EVIDENCE**

9 In the evidence that follows I will:

- 9.1 Summarise the Gravel Resource Management Report with a focus on its conclusions and recommendations;
- 9.2 Comment on the Section 42A Reporting Officer's assessment of coastal erosion and natural hazards (set out at section 2.4, pages 12-13 of the Section 42A Report);
- 9.3 Comment on the conditions of consent recommended in the Section 42A Report and whether or not they adequately cover the recommendations made in the Gravel Resource Management Report.

### **TECHNICAL REPORT – SUMMARY OF CONCLUSIONS**

10 The Gravel Resource Management Report studied the observed changes in river morphology and contrasted the observations with the historical and present river management practices for the main rivers where gravel extraction occurs.

11 The report reviewed the relevant geological and geomorphological processes, river management methods used by HBRC, river and coastal

sediment budgets, historical gravel extraction volumes, recent advances in measurement and modelling techniques applied and explored by HBRC, and explained the calculation methods used to determine gravel availability and sustainable allocation volumes. It also reviewed the environmental effects of the activity including coastal processes and carried out an extensive quantitative analysis of the morphological changes in the river by analysing the historical cross section survey records.

- 12 The main conclusions and recommendations of this report are that:
- 12.1 River management including gravel extraction, while being a necessary activity to maintain the present land use of the floodplains, has led to significant changes to the natural river sediment transport, morphology and coastal sediment supply rates.
  - 12.2 Gravel transport and supply rates estimates have a high degree of uncertainty.
  - 12.3 Due to this high uncertainty, the adaptive method based on river cross section surveys and a design mean riverbed level (grade line) currently used by HBRC to allocate gravel resources, is adequate.
  - 12.4 While HBRC continues to investigate opportunities to implement new methods and technologies to optimise the management of gravel resources, new techniques are not expected any time soon to be a replacement for the present case-by-case active and adaptive allocation process which is recommended to be continued.

#### **RESPONSE TO MATTERS RAISED IN THE SECTION 42A REPORT**

- 13 I have reviewed the Section 42A Report issued on 7 October 2021. Matters relating to coastal erosion and natural hazards are set out at section 2.4, pages 12-13 of the Report.

14 I agree with the Reporting Officer that the focus of the gravel extraction activities on coastal gravel supply should be on the Tukituki River. However, I note that the consent also allows the extraction of sand, and sand is part of the submerged sediment present in the beaches, so it is also important to manage and understand the effect of sediment extraction in the Tutaekuri and Ngaruroro rivers.

15 At page 13 of the Section 42A Report, the author states:

In order to manage the effects of the gravel extraction on coastal supply I recommend consent condition 32d under the Tukituki River consent as recommended by Dr Tunnicliffe as a “*precautionary approach*” that requires an investigation report that seeks to quantify the supply of gravel to the coast from the Tukituki River, and a high-level assessment of the coastal erosion effects of the extraction is to be undertaken. And then, if any management or mitigation is required then this can be implemented through an adaptive management approach.

To provide context, if the report finds that the gravel supply to the coast from the Tukituki River on average (I note the supply would change year on year) is a certain volume, then this could be rationalised against what the gravel supply is along the Tukituki River, what is being extracted and to what extent the coast is eroding. I understand that HBRC undertake coastal transect monitoring as part of another body of work, so this information would be used to help manage the gravel extraction operation.

16 I consider that this study would be useful and broadly agree with the proposed condition. However, in my view it would be more accurate to describe the purpose and approach of the investigation as follows:

If this future investigation finds that the gravel supply to the coast from the Tukituki River on average is decreased by a certain value due to river gravel extraction, this is compared with the coastal sediment budgets and littoral transport rates to provide an indication of the magnitude of the impact. The same investigation should indicate sustainable long-term extraction rates to be followed as a general long-term guideline in the gravel allocation process. However if, in order to maintain the river in manageable conditions, significant unsustainable extraction is necessary at some reaches, mitigation measures of the likes of beach gravel nourishment and beach control structures may need to be implemented. No mitigation may be needed if this extraction is not significant.

17 I have reviewed the recommended consent conditions in Appendix 4 of the Section 42A Report, particularly those that are within my field of

expertise, which is river and coastal hydraulics, sediment transport and engineering.

18 I have commented on the proposed conditions for the Tukituki Catchment Rivers consent below. I note that the consent conditions for the Ngaruroro and Tutaekuri Rivers are the same, though the numbering differs.

19 Condition 20 states:

The consent holder shall ensure that the site is restored on completion of the gravel extraction operation as follows:

- a) Gravel heaped up during the process of removal shall be spread out by the consent holder on completion of the gravel extraction operation.
- b) Consent holder shall remove all plant, machinery, equipment, signs and other structures associated with the operation from the riverbed immediately on completion of operations.
- c) No reject, surplus or unused gravel from a gravel processing plant is to be deposited into or onto the active river channel.
- d) All disturbed areas shall be reinstated as far as is practical to minimise the release of sediment to flowing waters.

20 Condition 20 (d) should refer to *cohesive sediments* instead of *sediments* as gravel and sand are also sediment.

21 Condition 30 states:

Bed level cross section surveys shall be undertaken every three years, at the established benchmarks illustrated in the plan attached as Appendix D.

In the highlighted part above I suggest adding "...shall be undertaken at least every three years"

22 Condition 31 provides that:

Riverbed gravel particle size monitoring surveys shall be undertaken on a six yearly basis at the established benchmarks that represent the extraction reach illustrated in the plan attached as Appendix D.

Currently there is no plan attached as Appendix D.

23 I do not think these monitoring surveys need to be done at every river cross section location. This needs to be done at certain locations along the river but not necessarily at the same spatial resolution as the topographical surveys. I suggest that this condition be amended to refer to 'selected established benchmarks' (rather than 'the established benchmarks').

24 Alternatively this condition could be reworded to read:

Riverbed gravel particle size monitoring surveys shall be undertaken at locations along the river and within the active channel that allow an adequate temporal and spatial characterization of the changes in this parameter.

25 Condition 32 states:

Based on the survey results of Conditions 28 and 29, an Annual Gravel Status Report shall be submitted to the Manager Compliance by the end of June each year for approval by the Manager Compliance in a technical authorisation capacity. The report shall address but not be limited to:

- a) Calculation and comparison of mean bed levels and reach volumes between cross sections and between annual surveys.
- b) Comparison of mean bed levels and reach volumes with bed level design grade lines.
- c) Based on (a) and (b), an assessment of the Sustainable Gravel Allocation (cubic metres per year [loose measure]) for the upcoming year of 1 January to 31 December.
- d) Coastal gravel supply volume estimates ( $m^3/year$ ), coastal gravel erosion effects assessment and recommended coastal erosion mitigation measures (if required). Gravel extraction in any one year shall not exceed the authorised Sustainable Gravel Allocation for that year without the written approval of the Manager Compliance.

26 I generally agree but note that the design grade line may be changed as new studies are developed. Also, there are cases where, because of local issues in the river and despite riverbed levels being below the grade line, gravel must be extracted to avoid riverbank erosion. Those matters could presumably be incorporated into the report required by condition 32, as the matters listed in sub-paragraphs (a) to (d) of that condition are not an exclusive list.

**RESPONSE TO MATTERS RAISED IN SUBMISSIONS**

27 No matters were raised in submissions relating to my area of expertise.

**CONCLUSIONS AND RECOMMENDATIONS**

28 I agree with the conclusion reached in the Section 42A Report (at page 13) that provided:

28.1 Appropriate monitoring and investigations of river and coastal morphology processes continues;

28.2 Sustainable allocation of gravel extraction is maintained; and

28.3 The recommended conditions are adhered to,

the actual and potential adverse effects of the proposed activities on coastal gravel supply and erosion is likely to be no more than minor.



**José Francisco Beyá**

5 November 2021