

Before a Board of Inquiry
Transmission Gully
Notices of Requirement and Consents

under: the Resource Management Act 1991

in the matter of: Notices of requirement for designations and resource consent applications by the NZ Transport Agency, Porirua City Council and Transpower New Zealand Limited for the Transmission Gully Proposal

between: **NZ Transport Agency**
Requiring Authority and Applicant

and: **Porirua City Council**
Local Authority and Applicant

and: **Transpower New Zealand Limited**
Applicant

Statement of rebuttal evidence of Colin John Roberts (Porirua Harbour Modelling) for the NZ Transport Agency and Porirua City Council

Dated: 18 January 2012

REFERENCE: John Hassan (john.hassan@chapmantripp.com)
Nicky McIndoe (nicky.mcindoe@chapmantripp.com)

**STATEMENT OF REBUTTAL EVIDENCE OF COLIN JOHN
ROBERTS FOR THE NZ TRANSPORT AGENCY AND PORIRUA
CITY COUNCIL**

INTRODUCTION

- 1 My full name is Colin John Roberts.
- 2 I have the qualifications and experience set out at paragraphs 2, 3, 4 and 5 of my statement of evidence in chief, dated 16 November 2011 (*EIC*).
- 3 I repeat the confirmation given in my EIC that I have read, and agree to comply with, the Code of Conduct for Expert Witnesses (Consolidated Practice Note 2011).
- 4 In this statement of rebuttal evidence I respond to the evidence of Helen Anne Kettles, on behalf of Director-General of Conservation.
- 5 The fact that this rebuttal statement does not respond to every matter raised in the evidence of Helen Anne Kettles within my area of expertise should not be taken as acceptance of the matters raised. Rather, I rely on my EIC and this rebuttal statement to set out my opinion on what I consider to be the key Porirua Harbour Modelling matters for this hearing.
- 6 For the purposes of this evidence, I will refer to the NZ Transport Agency (*the NZTA*) Project¹ and the Porirua City Council (*PCC*) Project² collectively as the "Transmission Gully Project" (and hereafter, *the TGP* or *the Project*).

SUMMARY OF EVIDENCE

- 7 I have read the statement of evidence provided by Helen Anne Kettles for the Director-General of Conservation in relation to effects on the Porirua Harbour.
- 8 This evidence has not caused me to depart from the opinions I expressed in my EIC and I re-confirm my conclusion that the Porirua Harbour Model is fit for its intended use to predict the likely fate of terrestrial sediment loads entering the harbour during rainfall events occurring on different land use scenarios.

¹ The 'NZTA Project' refers to the construction, operation and maintenance of the Main Alignment and the Kenepuru Link Road by the NZTA.

² The 'PCC Project' refers to the construction, operation and maintenance of the Porirua Link Roads (being the Whitby Link Road and the Waitangirua Link Road) by PCC.

EVIDENCE OF HELEN ANNE KETTLES

- 9 In paragraph 39 of her evidence, Ms Kettles suggests that in the Harbour modelling work carried out it is unclear why in an event with a northerly wind and a Q10 flood event in the Horokiri Catchment there is no sediment accumulating near the Horokiri Stream mouth as has been observed at the site.
- 10 The majority of the sediment input to the Harbour model at Horokiri Stream is mud (85% mud and 15% sand). The modelling predicts that this mud entering the Harbour from the Horokiri Stream does not settle in the vicinity of Horokiri Stream mouth because of the shallow water depth resulting in currents that are sufficient to transport the mud away from that area. Sampling by NIWA³ shows that the majority of the sediment build up in the vicinity of the Horokiri stream mouth is sand (80% to 95% sand). The observed sediment build up in the vicinity of the Horokiri Stream mouth is likely to be the result of long term, cumulative, depositing of sand having been moved around within the Harbour. Such build up occurs at a time scale much longer than that of a single discrete event. The modelling of the Q10 event is a discrete, short timescale, simulation with results presented 3 days following the peak of the flood event. Such results would not be expected to show sediment build up typical of the feature referred to.
- 11 In paragraph 42 of her evidence, Ms Kettles indicates that it is her understanding that there is a +/- 50 % margin of error in the accuracy of the harbour modelling.
- 12 This understanding is incorrect. This margin of error quoted by Tonkin & Taylor in its peer review refers to the sediment modelling for the catchment and not for the harbour modelling. As stated in my EIC, the validity of the harbour modelling is considered sufficient for the model to be used as a predictive tool to provide information to support ecological analysis and decision making.
- 13 I have not given a quantitative estimate of the uncertainty in the harbour sediment transport modelling predictions because of the number and complexity of the inter-related processes being modelled. The validation of the model demonstrates, through graphical plots of modelled and observed parameters varying over time and assessment of long term sedimentation patterns, that the model is generally reproducing the hydrodynamic and sediment movement behaviour observed in the harbour.

³ A. Swales, et al, (2005); Pauatahanui Inlet: Effects of historical catchment landcover changes on Inlet sedimentation Patterns and Rates of Sedimentation within Porirua Harbour.

- 14 In paragraph 42 of her evidence, Ms Kettles further states that it became clear to her that the model predictions should only be used a guide.
- 15 I agree. The intended use of the harbour model was to predict the likely fate of terrestrial sediment loads entering the harbour during rainfall events occurring on different land use scenarios. As such it is clear that the model predictions are intended to be used a guide to aid in assessing the likely effects of sedimentation in the harbour between the "no Project" and "with Project" scenarios.
- 16 In her evidence, paragraph 43 and 44, Ms Kettles highlights concern regarding the fact that the modelling has not addressed the possibility of re-suspension of the deposited sediment in the harbour following the occurrence of a flood event.
- 17 It is acknowledged that re-suspension of sediment could occur with a no rain wind event occurring following a flood event. Indeed, there are an infinite number of combinations of wind, rain and construction scenarios which could have been modelled. It would be extremely difficult to assess these effects whilst still maintaining the clarity of results so that those results can be meaningfully and usefully interpreted within the Project work. It should be re-emphasised that the model was developed as a predictive tool to provide information to support ecological analysis and decision making. The scope of the study was not to predict all possible sediment deposition patterns.



Colin John Roberts
18 January 2012