IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of an application by Meridian Energy Limited for resource consents for the Mokihinui Hydro Project

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SUPPLEMENTARY EVIDENCE OF IAN JOWETT ON BEHALF OF MERIDIAN ENERGY LIMITED

ANDERSON LLOYD
LAWYERS
DUNEDIN

Solicitor: Stephen Christensen/
Philippa Jones

Level 10, Otago House
Cnr Moray & Princes Street,
Private Bag 1959,
DUNEDIN 9054
Tel 03 477 3973
Fax 03 477 3184

1. INTRODUCTION

1.1 My full name is Ian Jowett. I refer to my qualifications and the introduction given in my earlier statement of evidence.

1.2 After the presentation of my evidence on 16 September 2008, Dr Ryder asked me why I evaluated flow fluctuations between the proposed minimum flow of 16 cumecs and the median flow of 46 cumecs and not over the normal range of flow fluctuation (16 to 120 cumecs). I was not able to answer this question adequately at the time so I have prepared this answer.

1.3 When evaluating the effects of flow fluctuation on instream habitat, it is difficult to decide on a baseline to which the effects should be compared. In my evidence, I compared the loss of habitat due to flow fluctuations to two baselines, the amount of habitat at a steady flow of 31 cumecs and the amount of habitat at a steady flow of 16 cumecs.

1.4 However, both of these baselines are rather unrealistic in their steady flow assumption because the flows of the Mokihinui are rarely steady and there is usually a flood or fresh every week or so. These frequent floods and freshes reduce available habitat just as artificial flow fluctuations reduce habitat.

1.5 In my analysis, I assumed that these frequent floods and freshes would have the same detrimental effect on habitat as would the artificial flow fluctuations above median flow. Thus, my analysis attempted to calculate the additional habitat loss due to flow fluctuations by making an allowance for the habitat loss caused by natural flow variations. I assumed that the power generation fluctuations caused the habitat loss between the minimum and median flows, and that the additional power fluctuation up to 120 cumecs would not cause any additional habitat loss, because the frequent natural variations above median flow would have had the same or perhaps a worse detrimental effect. On that basis, I consider that examining the change in habitat between flows of 16 and 120

cumecs would give an exaggerated picture of the effects of flow fluctuation caused by the MHP operation, because it doesn't take the effect of natural fluctuations into account.

1.6 I believe that my calculations of habitat effects of flow fluctuations between 16 and 46 cumecs in fact portray a worse case scenario, where I assume that benthic invertebrates will respond instantly to a reduction in habitat suitability, with a corresponding reduction in density and total invertebrate numbers. As suggested in the evidence of Dr Suren, it is possible that benthic invertebrates can adapt to frequent flow fluctuation to some extent by seeking shelter on the undersides of stones when velocities increase. New Zealand studies and international literature show that flow fluctuations have detrimental effects on benthic invertebrates, but that there can also be relatively high invertebrate densities in rivers with frequent flow fluctuations.

Ian Jowett