

BEFORE THE NORTHLAND REGIONAL COUNCIL

under: the Resource Management Act 1991

in the matter of: Resource consent applications by the Te Aupōuri Commercial Development Ltd, Far North Avocados Ltd, P McLaughlin, NE Evans Trust & WJ Evans & J Evans, P & G. Enterprises (PJ & GW Marchant), MP Doody & DM Wedding, A Matthews, SE & LA Blucher, NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan Valadares & D Bryan (Property No 1), MV Evans (Property No 2), MV Evans (Property No 1), Tuscany Valley Avocados Ltd (M Bellette), NA Bryan Estate, SG Bryan, CL Bryan, KY Bryan Valadares & D Bryan (Property No 2), Tiri Avocados Ltd, Valic NZ Ltd, Wataview Orchards (Green Charteris Family Trust), Mate Yelavich & Co Ltd, Robert Paul Campbell Trust, Elbury Holdings Ltd (C/-K J & F G King) for new groundwater takes from the Aupōuri aquifer subzones: Houhora, Motutangi and Waiharara and applications by Waikopu Avocados Ltd, Henderson Bay Avocados Ltd, Avokaha Ltd (c/- K Paterson & A Nicholson), KSL Ltd (c/- S Shine), Te Rarawa Farming Ltd and Te Make Farms Ltd for increased existing consented takes from the Aupōuri aquifer subzones: Houhora, Motutangi, Sweetwater and Ahipara.

Supplementary Statement of evidence of **Timothy Michael Baker** for
the Director-General of Conservation
(3 September 2020)

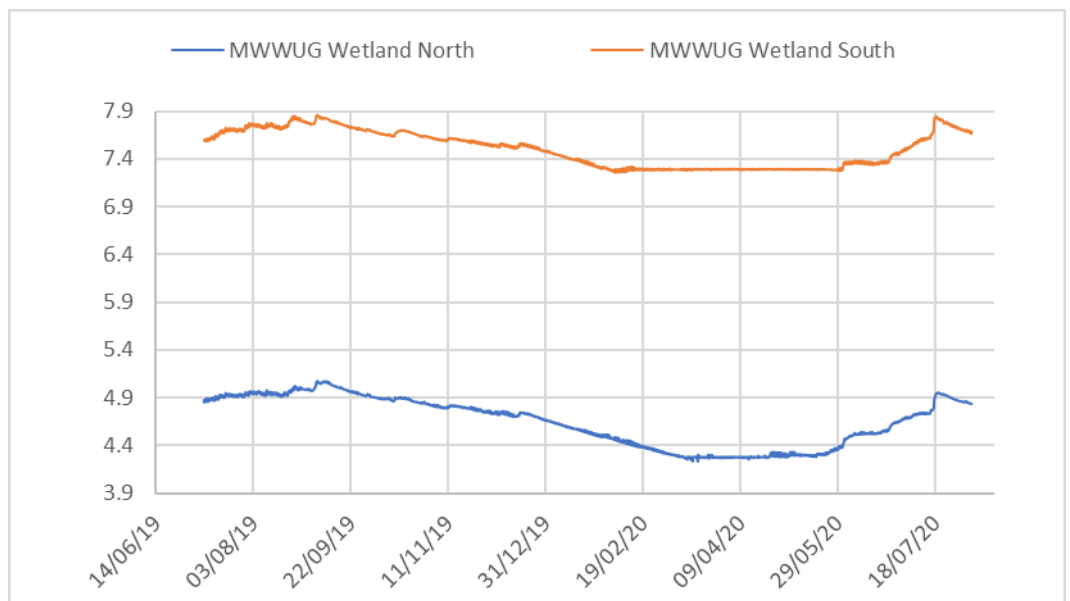
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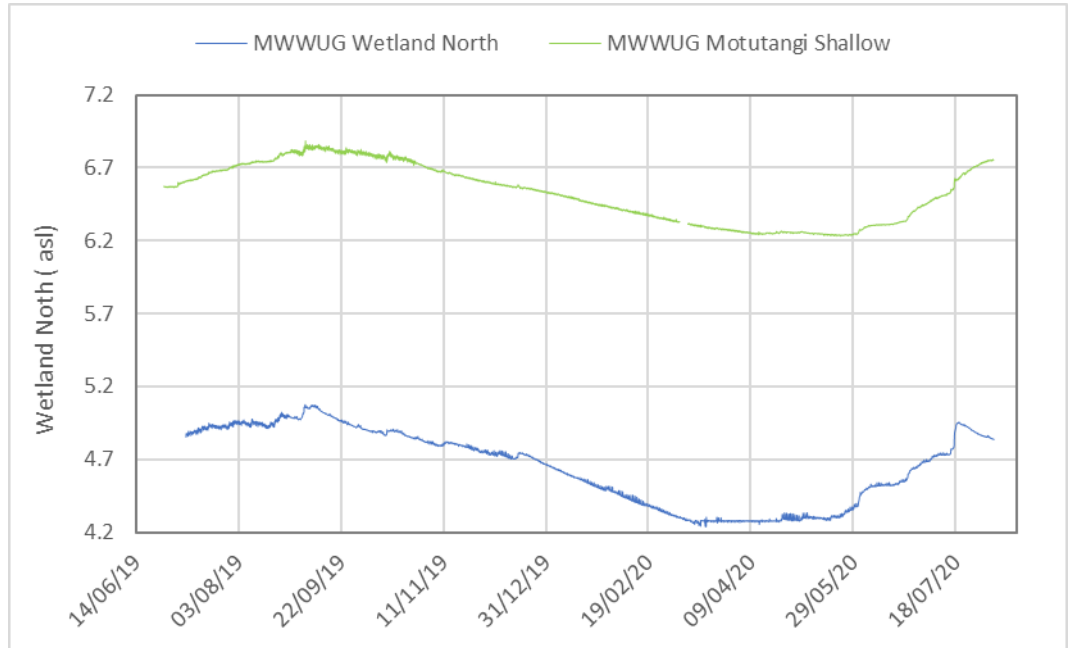
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SUPPLEMENTARY STATEMENT OF EVIDENCE OF TIMOTHY MICHAEL BAKER

- 1 My full name is Timothy Michael Baker. My qualifications and experience are outlined in my Evidence in Chief (EIC) dated 21 August 2020.
- 2 During the hearing on September 2, I was asked to provide comment on my interpretation of Figures 2 and 3 in the Supplementary Evidence of Mr Jon Williamson (dated 31.09.20).
- 3 Mr Hughes has kindly provided me with the excel spreadsheets of the data. I have used that data to generate the plots below. I am not certain of the datum they have been surveyed to (likely to be relative to mean sea level) but have assumed that they are at least relative to each other.
- 4 The same data from Figure 2 are shown below. I have put both sets of data on the same axis for relative comparison. It compares water levels at the two wetland monitoring sites, referred to as MWWUG Wetland North and MWWUG Wetland South.



- 5 Water levels at the two wetland sites are at different elevations. The southern site is approximately 2.7 m higher than the northern site.
- 6 The same data from Figure 3 are shown below. I have put both sets of data on the same axis for relative comparison. It is a plot of water level measured in the shallow monitoring well referred to as Motutangi Shallow and wetland water levels measured at Wetland North.



- 7 The shallow groundwater site is located adjacent to the edge of the wetland area. The wetland site is within an open water area of wetland.
- 8 The shallow groundwater is approximately 1.8 m higher than the levels in the wetland.
- 9 These sites are located approximately 1400 m from each other.
- 10 Mr Williamson in his Supplementary evidence at [25(b)], describes the wetland levels as showing similar temporal trends across the wetland, whilst the shallow groundwater levels adjacent to the wetland show a slower recessional trend during the drought than levels in the wetland. He states that this suggests that the wetland is supported by rainfall only, while shallow groundwater is supported by groundwater throughflow/potential upward seepage.
- 11 It is not unexpected that the northern wetland levels have a steeper recession. The monitoring site is in a large open water area subject to higher evapotranspiration losses than shallow groundwater.
- 12 Additionally, the recession in groundwater during a drought would be expected to be different as the wetland and aquifer will likely have different hydraulic conductivity and seepage/drainage losses would be at different rates.
- 13 I agree that the data show different recessional responses in groundwater and the wetland, and that it is unlikely that the wetland is a surface expression of the shallow groundwater table. However, that has never been the conceptualisation presented, rather it is a question of whether groundwater could influence the wetland, and if so, by how much/what contribution. In my opinion, these graphs do not provide undeniable evidence of zero connectivity.

14 Overall, it is evident that the monitoring required in accordance with the MWWUG is proving very valuable and is significantly increasing our knowledge around the functioning of this system. Over the remainder of the staged implementation period, this will further increase.

A handwritten signature in black ink, appearing to read 'Tim Baker', written in a cursive style.

Tim Baker

03 September 2020