

BEFORE THE HEARINGS PANEL

IN THE MATTER of the Resource Management Act 1991 ('the Act')

AND

IN THE MATTER of Proposed Plan Change 9 to the Hawke's Bay
Regional Resource Management Plan

**STATEMENT OF REPLY EVIDENCE OF ANNA LOUISE MADARASZ-SMITH FOR
HAWKE'S BAY REGIONAL COUNCIL**

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1. INTRODUCTION

- 1.1 My name is Anna Louise Madarasz-Smith.
- 1.2 I hold a Master of Science degree with first class honours (Environmental and Marine Science) from the University of Auckland, 2003.
- 1.3 I am Team Leader/Principal Scientist Marine and Coast with the Hawke's Bay Regional Council (**HBRC**) and have over 18 years' experience in coastal/marine water quality and ecology. I have held my current position for three years. Prior to this I held the position of Senior Scientist – Coastal Quality (HBRC) and Scientist – Coastal Quality (HBRC). I am the programme manager/lead scientist for coastal and marine science within the Environmental Science section, and have carried out a number of monitoring studies and investigations on the state of the Hawke's Bay coastal environment including reef, soft-sediment and estuarine monitoring and assessments. I have been the project manager/lead scientist for HBRC's Recreational Water Quality monitoring project since 2004, and am the Project Lead for LAWA (Land, Air, Water Aotearoa) – Can I Swim Here module.
- 1.4 During my employment with HBRC I was sub-contracted to the 'Managing Upstream – Stage 1A and B' project team (led by NIWA) commissioned by the Ministry for the Environment to inform limit setting under the National Policy Statement for Freshwater Management 2020 (**NPSFM 2020**) to account for estuarine values. I was also the project champion and co-author of the Estuarine Trophic Index which was developed to determine risk and susceptibility of New Zealand estuaries to eutrophication (Tool 1), to provide a quantification of expressions of eutrophication based on empirical data (Tool 2), and to provide a modelled approach that could account for predicted changes to nutrient loading (Tool 3).
- 1.5 I have been the scientific advisor on a number of plan change and consent activities and have presented evidence to a hearings panel for consent hearings (Ravensdown, Wairoa District Council, Napier City Council) and a Board of Inquiry hearing (Tukituki Plan Change and Ruataniwha Water Storage consents).
- 1.6 I have authored or co-authored a number of technical reports which detail the current state, trends or investigative outcomes of estuarine and marine water quality and ecology for the Hawke's Bay Region.
- 1.7 I am a member of the New Zealand Marine Science Society and currently hold the position of Vice President. I am also a member of the New Zealand Coastal Society.

1.8 Previously, I worked for the National Institute of Water and Atmospheric Research (NIWA – Nelson), and Uniservices at the University of Auckland.

1.9 I have prepared this evidence in my capacity as an expert, and although this is not a court hearing I confirm that I have read and understand the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note dated 1 December 2014. I have complied with it when preparing my evidence, and I agree to comply with it when I give any oral evidence. Other than where I state that I am relying on the evidence of another person, my evidence is within my area of expertise. 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

1.10 The purpose of this evidence in reply is to address matters raised in statements of evidence filed by submitters.

1.11 I provide narrative on matters raised by other witnesses only where I consider that what they are saying may not be correct or that it should be qualified.

1.12 For the avoidance of doubt, any failure to cross reference or specifically discuss any matter raised by other witnesses does not mean I agree with that evidence of the other witnesses. My opinion remains as stated in my technical memorandum appended to the section 42A Hearing Report on Proposed Plan Change 9 (**Hearing Report**), except to the extent covered or identified now in this reply brief.

1.13 My evidence will address matters raised in the evidence of Dr Greer on behalf of Beef + Lamb New Zealand, specifically in relation to freshwater limit-setting to account for estuarine values and outcomes.

2. FRESHWATER LIMIT SETTING TO ACCOUNT FOR ESTUARINE VALUES/OUTCOMES

2.1 No technical evidence has been received in relation to Schedule 26.5 (Ahuriri/ Te Whanganui-a-Orutū and Waitangi Estuaries) of proposed Plan Change 9 (**PPC9**).

2.2 However, Dr Greer has discussed in his evidence the use of dissolved inorganic nitrogen (**DIN**) and dissolved reactive phosphorus (**DRP**) targets for lower tributaries, within schedule 26 of PPC9, as being inappropriate for the values they are aligned to (estuarine health – paragraph 91). Dr Haidekker will address the levels of these nutrients within the freshwater areas of the Tūtaekurī, Ahuriri, Karamū and

Ngaruroro. The contribution of these nutrients to overall estuarine health is discussed in my technical memo (appendix seven) appended to the Hearing Report.

- 2.3 Briefly, section 1.5 of the NPSFM 2020 requires HBRC to manage freshwater **and**, to the extent that they are affected by freshwater, receiving environments (which may include estuaries and the wider coastal marine area).
- 2.4 I disagree with Dr Greer's recommendation to set the 2040 targets for DIN and DRP for the lower tributaries at current state (paragraph 91). A variety of evidence indicates a reduction in the overall health of the Te Whanganui-a-Orutū/Ahuriri and Waitangi Estuaries (the receiving environments) due to current nutrient loading. This includes:
- (a) High levels of Chlorophyll *a* observed in the Clive arm of the Waitangi estuarine area, and in the Upper Ahuriri Estuary. At the levels observed, this would equate to band D of the Estuarine Trophic Index – “Excessive algal growth making ecological communities at high risk of undergoing a regime shift to a persistent, degraded state without macrophyte/seagrass cover”¹.
 - (b) Visible algal blooms (*Cryptomonas sp.*) in the lower Karamū and Ngaruroro River in areas of freshwater/saltwater transition and pools². Visible blooms of *Cylindrotheca sp.* in the upper Ahuriri Estuary.
 - (c) High catchment nitrogen loading to the Waitangi Estuary estimated as 1738 tonnes per year (from Estuarine Trophic Index – Tool 1 National Input data).
 - (d) Levels of sediment nitrogen in the Waitangi Estuary indicative of moderate stress, and in the Upper Ahuriri Estuary indicative of significant, persistent stress.³
- 2.5 The need to manage nutrients for longer term outcomes also has direct and indirect relationships with other variables. High suspended sediment reduces the amount of

1 Please note these are interim thresholds as described in Robertson, B.M., Stevens, L., Robertson, B., Zeldis, J., Green, M., Madarasz-Smith, A., Plew, D., Storey, R., Hume, T., Oliver, M., 2016. NZ Estuary Trophic Index (ETI) Screening Tool 2. Determining Monitoring Indicators and Assessing Estuary Trophic State. Prepared for Envirolink Tools Project: Estuarine Trophic Index, MBIE/NIWA Contract No: C01X1420. 68p.

2 Madarasz-Smith, A., Wade, O., Wade, H., Hicks, A., 2016. The Estuaries of the TANK Catchments: Ahuriri and Waitangi Estuaries, HBRC Report No. RM-16-20. Hawke's Bay Regional Council, Ahuriri and Waitangi Estuaries, Hawke's Bay.

3 Madarasz-Smith, A., Shanahan, B., 2020. State of the Hawke's Bay Coastal Marine Environment: 2013 to 2018 (No. Hawkes Bay Regional Council Publication No. 5425). Hawke's Bay Regional Council.

light that penetrates through the water column. In the current high-sediment environment, the low light levels may limit the growth of nuisance algae.

- 2.6 Reductions in suspended sediment alone may increase light penetration through the water column with an associated risk of more nuisance macroalgae and/or phytoplankton if nutrient supply remains high. Therefore, both sediment and nutrient management is recommended to increase the likelihood of overall improvements to estuarine condition.

Anna Madarasz-Smith

19 May 2021