

**BEFORE THE INDEPENDENT HEARINGS PANELS APPOINTED TO HEAR AND MAKE  
RECOMMENDATIONS ON SUBMISSIONS AND FURTHER SUBMISSIONS ON PROPOSED PLAN  
CHANGE 1 TO THE NATURAL RESOURCES PLAN FOR THE WELLINGTON REGION**

**UNDER** the Resource Management Act 1991 (the  
Act)

**AND**

**IN THE MATTER** of Hearing of Submissions and Further  
Submissions on Proposed Plan Change 1 to  
the Natural Resources Plan for the  
Wellington Region under Schedule 1 of the  
Act

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**STATEMENT OF SUPPLEMENTARY EVIDENCE OF DR MICHAEL  
JOHN CRAWSHAW GREER**

**ON BEHALF OF GREATER WELLINGTON REGIONAL COUNCIL**

**HEARING STREAM THREE – EARTHWORKS, VEGETATION**

**CLEARANCE AND FORESTRY AND RURAL LAND USE**

**15 APRIL 2025**

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## **INTRODUCTION**

- 1 My full name is Michael John Crashaw Greer. I am the Principal Freshwater Scientist at Torlesse Environmental Ltd.
- 2 The purpose of this Supplementary Statement of Evidence is to consider the extent to which the amended PC1 provisions for earth works and rural land use recommended respectively in Ms Alisha Vivian's<sup>1</sup> and Mr Gerard Willis'<sup>2</sup> S42A Officer's Reports will contribute to the achievement of the amended Tables 8.2, 8.4 and 9.2 TASs recommended in Ms Mary O'Callahan's S42A Officer's Report<sup>3</sup> for Hearing Stream 2.

## **QUALIFICATIONS, EXPERIENCE AND CODE OF CONDUCT**

- 3 My qualifications and experience are set out in paragraphs 4 to 13 of my Statement of Primary Evidence<sup>4</sup>. I repeat the confirmation given in that evidence that I have read and agree to comply with the Code of Conduct for Expert Witnesses.

## **ASSESSMENT OF THE LIKELIHOOD OF THE AMENDED PC1 TASS BEING MET UNDER THE AMENDED REGULATORY PROVISIONS**

- 4 I understand that in his S42A Officer's Report<sup>2</sup>, Mr Willis recommends a number of amendments to the Rural Land Use provisions in PC1, including:
  - 4.1 Requiring (through farm environment plans developed in accordance with Schedule 36 of PC1) that all priority erosion risk land is subject to appropriate erosion risk treatment by 2040 in part-FMUs where the suspended fine sediment TASs are not met, rather than requiring treatment of high erosion risk land and the revegetation of the highest erosion land; and
  - 4.2 Requiring (through farm environment plans) exclusion of cattle, farmed pigs, and deer from streams greater than one meter wide in the Mākara catchment,

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<sup>1</sup> Plan Change 1 to the Natural Resources Plan for the Wellington Region Section 42A Hearing Report. Hearing Stream 3: Earthworks. Prepared by Alisha Vivian for Greater Wellington Regional Council (dated 15<sup>th</sup> April 2025)

<sup>2</sup> Plan Change 1 to the Natural Resources Plan for the Wellington Region Section 42A Hearing Report. Hearing Stream 3: Rural Land Use. Prepared by Gerard Willis for Greater Wellington Regional Council (dated 15<sup>th</sup> April 2025)

<sup>3</sup> Plan Change 1 to the Natural Resources Plan for the Wellington Region Section 42A Hearing Report. Hearing Stream 2: Objectives. Prepared by Mary O'Callahan for Greater Wellington Regional Council (dated 28<sup>th</sup> February 2025)

<sup>4</sup> Evidence of Michael John Crawshaw Greer on Behalf of Greater Wellington Regional Council (dated 15<sup>th</sup> April 2025).

except in areas outside of low-slope land where such exclusion would be impractical, unnecessary, or require earthworks.

5 Ms Vivian<sup>1</sup> has also recommended that Rules WH.R24 and P.R23 for Earthworks be amended to:

5.1 Replace the 100 mg TSS/L discharge standard with a turbidity standard of 170 NTU, which I understand to be commonly applied to earthworks consents in the Wellington Region; and

5.2 Capture the winter shutdown requirements of Policies P.P29 and WH.P31 in part-FMUs where the suspended fine sediment TASs are not met.

6 To provide a broad indication of the potential effectiveness of these amended PC1 provisions, in Table 1 I provide an update to Table 2 of my Statement of Primary Evidence that incorporates Ms Vivian's<sup>1</sup>, Mr Willis's<sup>2</sup>, and Ms O'Callahan's<sup>3</sup> recommendations. This update:

6.1 Incorporates the modelling results attached in Appendix B of Mr Blyth's Statement of Primary Evidence<sup>5</sup>, which assesses the sediment loss reductions from rural land use that would be expected through:

6.1.1 Council-funded erosion risk treatment of priority erosion risk land that would be possible prior to 2040 under current funding levels through the Wellington Region's Erosion Control Initiative (WRECI); and

6.1.2 The amended stock exclusion requirements recommended in Mr Willis's<sup>2</sup> S42A Officer's Report (including stock exclusion requirements of the operative NRP).

6.2 Assumes that the impacts of earthworks on the achievement of the TASs are largely unchanged from what was previously considered in my Statement of Primary Evidence. This is because the amendments to the earthworks provisions set out in Ms Vivian's S42A Officer's Report do not fundamentally

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<sup>5</sup> HS3 PC1 Annual Load Model Evidence of James Mitchell Blyth on behalf of Greater Wellington Regional Council (dated 15<sup>th</sup> April 2025)

change the manner in which this activity is managed in part-FMUs where the suspended fine sediment TASs are not met. Specifically:

- 6.2.1 A discharge standard (now 170 NTU instead of 100 mg TSS/L) still applies, which should drive widespread use of chemically treated sediment retention ponds<sup>[1,2]</sup>;
- 6.2.2 The winter shutdown set out in Policies P.P29 and WH.P31 still applies under amended Rules WH.R24 and P.R23;
- 6.2.3 I assume that the Council will use its discretion to ensure consents obtained through Rules WH.R25 and P.R24 are managed so as not to generate substantially greater adverse effects than those allowed for by WH.R24 and P.R23.

7 In my opinion, the assessment provided in Table 1 can be considered conservative, as it assumes that private landowners will not undertake erosion risk treatment of priority erosion risk land beyond what is funded by the Council and that no further benefits from implementing FEP's are included in this assessment. Nevertheless, results suggest that Ms Vivian's and Mr Willis's amendments are only expected to increase the number of TASs that will not be met by the provisions alone by one. The TAS that is no longer expected to be achieved is for suspended fine sediment (assessed as visual clarity in Table 1) in Te Awa Kairangi lower mainstem part-FMU. As set out in paragraph 34 of my Statement of Primary Evidence<sup>4</sup>, this particular TAS requires a return to almost natural state conditions. Thus, it is not surprising that a relaxation of the rural land use provisions increases the risk of it not being met.

**Note:** *I understand that amendments are also being proposed to the commercial forestry and vegetation clearance provisions of PC1. As set out in paragraphs 31 to 40 of my Statement of Primary Evidence, sediment loss reductions associated with the commercial forestry and vegetation clearance provisions have not been modelled or assessed to date. Thus, the effect of the amendments to these provisions cannot be quantified here.*

**Table 1: Updated (from Table 2 of my Statement of Primary Evidence<sup>4</sup>) assessment of which of the amended (as per the recommendations in Ms O’Callahan’s S42A Officer’s Report for Hearing Stream 2<sup>3</sup>) *E. coli*, nutrient and suspended sediment TASs in rural and mixed rural part-FMUs are expected to be achieved by the amended provisions considered in Hearing Stream 3 (based on findings of Greer<sup>[3,4]</sup>, Mr Blyth’s Statement of Primary Evidence<sup>5</sup> and Easton *et al.*<sup>[5]</sup>). Green ticks indicate where the amended provisions are consistent with the achievement of the TASs, orange up arrows indicates where the amended provisions go beyond what is required to achieve the TASs and the red down arrows indicates where the amended provisions will not meet the TASs.**

Whaitua	Part-FMU	Ammon.	Nitrate	Clarity	<i>E. coli</i>	Diss. inorg. N	Diss. react. P	Overall
TWT	Ōrongorongo, Te Awa Kairangi and Wainuiomata small forested and Te Awa Kairangi forested mainstems	✓	✓	✓	✓	✓	✓	✓
	Te Awa Kairangi lower mainstem	✓	✓	↓	✓	✓	✓	↓
	Te Awa Kairangi rural streams and rural mainstems	✓	✓	↓	↓	✓	↑	↓
	Wainuiomata rural streams	✓	✓	↑	↓	✓	✓	↓
	Parangārehu catchment streams and South-west coast rural streams	✓	✓	↓	↓	✓	✓	↓
	Korokoro Stream	✓	✓	✓	✓	✓	✓	✓
TAoP	Taupō	✓	✓	✓	↓	✓	↑	↓
	Pouewe	✓	✓	✓	✓	✓	↑	✓
	Wai-o-hata	✓	✓	↑	✓	✓	↑	✓
	Takapū	✓	✓	✓	↓	✓	↑	↓
	Te Rio o Porirua and Rangituhi	↑	✓	✓	↓	✓	↑	↓

## CONCLUSIONS

8 The amended PC1 provisions for earthworks and rural land use, recommended respectively in Ms Alisha Vivian’s<sup>1</sup> and Mr Gerard Willis’s<sup>2</sup> S42A Officer’s Reports, are not expected to significantly reduce the number of TASs recommended in Ms Mary O’Callahan’s S42A Officer’s Report<sup>3</sup> for Hearing Stream 2 that will be achieved. Specifically, the only TAS that was expected to be achieved by the notified provisions but not the amended provisions is for suspended fine sediment in Te Awa Kairangi lower mainstem part-FMU. This assessment is conservative as it does not consider further improvements in water quality from implementing Farm Environment Plans on farms greater than 20 hectares, instead only considering planting of land through the council funded WRECI project and the stream fencing required by the operative NRP and PC1

**DATE: 15 APRIL 2025**

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

**DR MICHAEL JOHN CRAWSHAW GREER**

**PRINCIPAL SCIENTIST, DIRECTOR**

**TORLESSE ENVIRONMENTAL LIMITED**

## REFERENCES

- [1] Fazli, B.M. 2010. Optimising the effectiveness of sediments retention ponds for Waikato soil materials (Master of Science). The University of Waikato, Hamilton, New Zealand.
- [2] Auckland Regional Council (ARC). 2004. The Use of Flocculants and Coagulants to Aid the Settlement of Suspended Sediment in Earthworks Runoff : Trials, Methodology and Design (Technical Publication No. No. 227). Auckland Regional Council, Auckland, New Zealand.
- [3] Greer, M.J.C. 2023. Assessment of alignment between the regulatory provisions and target attribute states in proposed Plan Change 1 to the Natural Resources Plan – Te Awarua-o-Porirua Whaitua (Torlesse Environmental Report No. 2023–007). Torlesse Environmental Ltd, Christchurch, New Zealand.
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- [5] Easton, S., T. Nation and J. Blyth. 2025. PC1 annual contaminant modelling (Collaborations Technical Memorandum). Collaborations, Wellington, New Zealand.