

BEFORE THE HEARING PANEL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of Proposed Plan Change 26 to the Operative Waipā
District Plan

REBUTTAL STATEMENT OF EVIDENCE OF CHRISTOPHER ALLINGTON HARDY

Dated 19 April 2023

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1. INTRODUCTION

- 1.1 My full name is Christopher Allington Hardy and I am a Technical Principal (Water and Wastewater) at WSP Ltd providing technical direction on projects.
- 1.2 My qualifications and experience were set out in my Statement of Evidence dated 24 March 2023. I repeat the confirmation in my Statement of Evidence that I have read and agree to comply with the Code of Conduct for Expert Witnesses.
- 1.3 In this rebuttal statement of evidence, I respond to the evidence of:
- (a) Alec Duncan on behalf of Fire and Emergency NZ (FENZ);
 - (b) Craig Shearer on behalf of TA Projects Limited;
 - (c) Philip Jaggard on behalf of Kāinga Ora;
 - (d) Michael Campbell on behalf of Kāinga Ora; and
 - (e) Gurvinderpal Singh on behalf of Kāinga Ora.
- 1.4 I also address revisions made to the report titled '*Plan Change 26 – Water and Wastewater Infrastructure Assessment, 23 March 2023*' attached as Appendix 1 to my Statement of Evidence dated 24 March 2023 as a result of questions raised in the evidence of Mr Jaggard for Kāinga Ora.
- 1.5 The fact that this rebuttal statement does not respond to every matter raised in the evidence of a submitter within my area of expertise should not be taken as acceptance of the matters raised. I have focussed this rebuttal statement on the key points of difference that warrant a response.

2. CHANGES TO THE INFRASTRUCTURE ASSESSMENT REPORT

- 2.1 Following review of Mr Jaggard's evidence, paragraphs 6.1 to 6.4, I reviewed the modelling report attached as Appendix 1 to my Statement of Evidence dated 24 March 2023.
- 2.2 I note that a PC26 scenario based on 'commercially feasible capacity' was modelled and reported on where it should have been the 'plan enabled' capacity as stated in the scope of the assessment report. The report and associated results have been updated and a new revision of the report titled '*Plan Change 26 – Water and Wastewater Infrastructure Assessment, 17 April 2023*' is attached as Appendix 1 to this rebuttal evidence with the recent changes shown as tracked changes.
- 2.3 The 'commercially feasible capacity' PC26 scenario has a lower population than the PC26 'plan enabled capacity' scenario. The difference between the two scenarios is as follows:
- (a) The 'commercially feasible capacity' scenario population included in error is based on 2 dwellings per lot. It is a sub-set of the 'plan enabled capacity' that includes capacity that is estimated to represent commercially feasible development options. A share of this capacity, closer to the projected dwelling demand, is likely to be developed. Therefore, the total population was lower and the impact on the network was less.
 - (b) The 'plan enabled capacity' scenario is based on 2 dwellings per lot for all properties. This scenario is more conservative and represents the potential maximum demand and risk to the water and wastewater networks. This is consistent with the Medium Density Residential Standards (MDRS) assessment in the assessment report.

- 2.4 Ms Fairgray provided additional information regarding plan enabled capacity and commercially feasible capacity in paragraph 6.3 and 6.4 of her evidence dated 24 March 2023.
- 2.5 I note that the 'commercially feasible capacity' PC26 scenario included in error yielded issues within both the water and wastewater networks that would still warrant the inclusion of the Infrastructure Overlay and associated controls.
- 2.6 I also note that the 'commercially feasible capacity' scenario makes assumptions regarding where development will occur so the exact location and scale of potential issues could differ from the modelling results.
- 2.7 The modelling of the correct plan enabled PC26 scenario results in worse network performance due to a higher population based on 2 dwellings across all areas. I have reviewed my Statement of Evidence dated 24 March 2023 and confirm that the corrected PC26 scenario results do not change any of my previous conclusions regarding the need for the proposed Infrastructure Overlay and associated controls.
- 2.8 I acknowledge that the 'plan enabled capacity' PC26 scenario represents a conservative scenario that is not likely to occur in the short or medium term as stated by Mr Jaggard in his evidence. I comment further on this in my response to Mr Jaggard in Section 5 of this rebuttal evidence.
- 2.9 I note that Ms Fairgray has explained the differences in the net and gross population figures in her evidence and I concur with her explanation.

3. RESPONSE TO ALEC DUNCAN (FENZ)

- 3.1 Mr Duncan states that FENZ strongly supports new Rule 15.4.2.19 that requires an infrastructure capacity assessment to be required where it is proposed to establish more than two dwellings on a site located within a qualifying matter overlay.

- 3.2 FENZ has requested that the definition for infrastructure capacity assessment include the requirement for a suitably qualified and experienced person to demonstrate that the proposed subdivision or development can be adequately serviced in accordance with the New Zealand Fire Service Firefighting Water Supplies Code of Practice (SNZ PAS 4509:2008).
- 3.3 I note that the Waipā District Water Supply Bylaw 2022 states:
- (a) Section 12.4 – Council is under no obligation to provide an On-demand Supply to Customer for fire protection purposes at any particular flow or pressure, or maintain existing pressures or flows.
 - (b) Section 12.5 – Where a Customer requires a specific flow and pressure for internal fire systems this must be provided by the Customer within their own system.
- 3.4 Councils generally endeavour to provide a minimum service level at the boundary of private property, for the purpose of potable water supply and fire water supply. Waipā District Council targets a level of service of 20m pressure at the boundary and endeavours to supply FW2 from network fire hydrants, where practical.
- 3.5 The infrastructure capacity assessment is an engineering assessment of the network capacity, including fire hydrant capacity, outside of the requirements of the building code for which a private building development must comply, and for which a Fire Engineer would typically be engaged.
- 3.6 A qualified Fire Engineer would not typically have a role in the assessment of municipal infrastructure for fire compliance purposes and would not typically contribute to the design of the public water network. I acknowledge that:

- (a) FENZ has a vested interest in the performance the municipal water network outside the building code as related to fire response.
 - (b) Urban water networks are designed to comply with SNZ PAS 4509 in relation to fire hydrant location and spacing, as best practise.
- 3.7 The purpose of a water network infrastructure assessment requested by council is to ensure that potable demand and fire hydrant capacity across the wider network is not adversely affected.
- 3.8 If potable and fire water supply is adversely affected for the design scenario, the infrastructure assessment will outline potential upgrades necessary to enable the development. The Waipā District Council planning and design scenario considers fire demand during the peak daily potable water demand.
- 3.9 I understand that the outcome of the infrastructure assessment would form the basis of upgrade works to be undertaken by the developer, or a financial contribution over and above normal development contributions.
- 3.10 I do not support the addition of a specific requirement for suitably qualified professional (i.e., a Fire Engineer) and assessment regarding SNZ PAS 4509 to the current infrastructure capacity assessment definition as it is not required for the design of municipal water networks for fire supply capacity. Councils already consider fire capacity as part of normal network planning and design and a Fire Engineer does not need to be involved in this type of assessment.
- 3.11 In acknowledgement of the importance of fire water supply capacity I would however support an amendment to the proposed definition of an infrastructure capacity assessment as follows:

Infrastructure Capacity Assessment means an assessment of the capacity of an existing water, wastewater, or stormwater network to determine if there is enough capacity **(including fire water supply)** for a proposed development, or to define the requirements for network upgrades that would need to be implemented for the development to be approved. The exact requirements for an Infrastructure Capacity Assessment should be discussed and agreed with WDC on a case-by-case basis.

4. RESPONSE TO CRAIG SHEARER (TA PROJECTS LTD)

4.1 Mr Shearer requests the removal of the Infrastructure Constraints to greenfield land in the proposed Medium Density Residential Zone in Te Awamutu, and if appropriate, to other such zoned land in Waipā District.

4.2 Mr Shearer also states in paragraph 29 of his evidence:

In practice councils do not need to provide for reticulation in new greenfields development areas – the developers are required to pay for the full reticulation in the subdivided area, with the Council, funded by development contributions/financial contributions, picking up the tab for network upgrades.

4.3 I agree that new water and wastewater infrastructure within greenfield areas is typically provided by developers and is easier to provide than upgrades within brownfield areas. However, the potential impacts on the upstream (water) or downstream (wastewater) networks from higher density development outlined in my previous evidence, apply to both greenfield and brownfield areas.

4.4 Potential impacts on the wider strategic water and wastewater network from higher density development require further assessment regardless of the pre-development status of the land. Additional network infrastructure requirements need to be defined by Council and included in long term planning for the purpose of development contributions.

4.5 I do not support removal of the infrastructure overlay for greenfield development areas. The overlay is an appropriate trigger for infrastructure assessments that would identify potential issues and mitigations from both brownfield and greenfield development areas.

5. RESPONSE TO PHILIP JAGGARD (KĀINGA ORA)

5.1 Mr Jaggard requests the removal of the Infrastructure Overlay in its entirety.

5.2 Mr Jaggard states the following in paragraphs 1.4 and 1.5 of his evidence (emphasis added):

Based on the predicted growth that will occur by 2050 by the Council's economic expert, Ms Fairgray, the demand (and therefore potential water and wastewater infrastructure constraints) are in fact less than those under the PC26 modelling scenario (which has been deemed acceptable by Council's experts).

As the capacity of the water supply and wastewater systems is sufficient to service the growth forecast by Ms Fairgray up to 2050.....

5.3 It should be noted from paragraph 4.13 of my Statement of Evidence dated 24 March 2023 that the PC26 water network scenario has issues that could warrant additional upgrades, but Waipā District Council are prepared to accept the risk of this at the proposed PC26 level of permitted development.

5.4 Intermediate growth scenarios have not been assessed at this time so it cannot be concluded that there would not be issues within the networks as Mr Jaggard has stated, particularly if densities higher than the proposed permitted density were to be allowed due to the removal of the proposed Infrastructure Overlay restriction.

5.5 Mr Jaggard states the following in paragraphs 7.3 to 7.6 of his evidence (emphasis added):

Mr Hardy concludes that the assessment undertaken on the water and wastewater networks shows that the existing networks and planned upgrades would not be able to service higher densities under the MDRS scenario.

Whilst I agree with this statement based on the report provided, the key factor in assessing infrastructure capacity is the likely uptake of when growth will occur and whether the modelling undertaken accurately reflects growth and demand forecasts for the same period.

A key issue I have with water and wastewater modelling assessments undertaken to support the Infrastructure Constraint Overlay, is that the modelling assumes that each growth scenario modelled will occur

by 2050, as noted on all the system performance maps. My understanding is that this is an improbable scenario given Ms Fairgray's evidence.

In my opinion, this is an incorrect assumption for comparing the capacity of the networks, as the scenarios are not like for like comparison and do not align with growth forecasts to occur by 2050 in Ms Fairgray's evidence.

- 5.6 The PC26 and MDRS modelling scenarios represent a long-term prediction of the potential impact of development at the proposed permitted density. The baseline model scenario to which these are compared is the current network master planning scenario which is based on a 30-year infrastructure strategy to 2050, hence the naming.
- 5.7 I acknowledge that the modelled level of development may not occur by 2050. However, I note that the modelling approach enables a long-term comparison to be made with the current 2050 baseline model used for network master planning.
- 5.8 The long-term scenario predicts that there will be issues in the water and wastewater networks. The presence of issues across the wider networks in the model results in both the PC26 and MDRS scenario shows that there is potential for issues to arise anywhere in the network as development occurs over time.
- 5.9 I also note that network infrastructure (e.g. pipes) typically have a design life of 75-100 years. Assessing the capacity of existing networks does not necessarily need to reflect these timeframes as use of the existing asset is maximised. However, the assessment of planned new infrastructure ideally should consider long-term scenarios. The baseline model includes planned future infrastructure, so it is important to assess it considering potential long-term development so that investment is as efficient as possible.
- 5.10 Mr Jaggard states the following in paragraph 7.7 of his evidence (emphasis added):

For comparative purposes, the infrastructure capacity assessments should have been undertaken using the forecast growth predictions from the growth model noted in Ms Fairgray's evidence with some sensitivity analyses being undertaken to account for potential spatial differences.

- 5.11 The assessment and modelling of intermediate development scenarios would be difficult because the location and density of development is not known, even if a theoretical total population has been defined. In my previous evidence I have outlined how this results in uncertainty in the location and scale of required infrastructure.
- 5.12 In my previous evidence I also acknowledge that removal of the overlay may be appropriate if a specific area is identified for higher density development, for which capacity can be planned for and implemented.
- 5.13 The potential impact of spatial and density differences on network planning is significant. While I agree that various scenarios assuming different locations and densities of development can be assessed, confidence in the results would in my opinion not be sufficient to remove the overlay given the potential issues shown in the current modelling.
- 5.14 The PC26 and MDRS model scenarios in the updated assessment report (Appendix 1) are based on plan enabled capacity (two and three dwellings per lot) across all urban areas. I agree with Mr Jaggard that this does not represent a scenario that is likely to occur based on a realistic demand. However, it is a reasonable scenario upon which Waipā District Council can assess the risk of development to network capacity and level of service throughout the life of the infrastructure.
- 5.15 Mr Jaggard states the following in paragraphs 7.14 and 7.15 of his evidence (emphasis added):

Though the PC26 and MDRS scenarios may enable significant intensification, the plan change will not itself generate additional demand for housing in Te Awamutu and Cambridge. PC26 governs where and in what built forms that demand might be accommodated, with the market ultimately deciding where to build. That is, PC26 will not result in greater population growth in the district but it will affect

the location and type of dwellings in which the growth will be accommodated, and the urban form of the townships.

Given that the actual forecast growth by 2050 (22,700 dwellings) is significantly less than the numbers used to assess the infrastructure capacity in the PC26 and MDRS scenarios, both these simulations should be ignored for the purposes of assessing infrastructure capacity constraints by 2050.

- 5.16 The purpose of the modelling assessments undertaken to date was to establish the risk of issues in the current planned water and wastewater networks because of the MDRS, and the need for the Infrastructure Overlay and associated restrictions on permitted development.
- 5.17 The modelled scenarios show that there is a significant risk of issues occurring because of development beyond current plan allowances.
- 5.18 The modelling was not intended to assess specific development constraints at a given location or time, hence the need for Infrastructure Assessments for development above the permitted level.
- 5.19 The requirement for an Infrastructure Capacity Assessment enables specific developments to be assessed where higher densities are proposed. Infrastructure requirements can then be defined for both short-term and long-term horizons and considering additional information (if any) known to Council at the time.
- 5.20 The proposed Infrastructure Overlay and the associated permitted density represents a trigger for an Infrastructure Assessment without imposing a need for assessments on all development.
- 5.21 The permitted level of development provides a degree of certainty for Waipā District Council regarding infrastructure planning and investment including the identification of strategic projects in long term planning which is typically required as an input into development contribution calculations.

- 5.22 The Infrastructure Overlay does not completely preclude development above the permitted level but ensures that opportunities for existing and planned infrastructure to be upgraded or improved are adequately considered.
- 5.23 It is my opinion that:
- (a) The assessment undertaken has shown that there is a need for the proposed Infrastructure Overlay and associated permitted level of development.
 - (b) Infrastructure Assessments would likely be required for all proposed development if the Infrastructure Overlay is removed.
 - (c) Removal of the Infrastructure Overlay would result in a complicated network planning environment where the current planned network is likely to have issues, and upgrades over and above would be reactive and likely inefficient.
 - (d) Infrastructure assessments for specific development are the most appropriate time to consider sensitivity around development timing, and potential demand across the network.
 - (e) While more realistic population demand projections can and should be considered in detailed assessments, Council also need to consider risk and contingencies and the plan enabled capacities are one way of doing this, albeit conservatively.
- 5.24 Although I acknowledge that development will occur in a different manner to the assessment scenarios, the assessment is appropriate for the purpose of establishing the need for the infrastructure overlay.

5.25 I do not support the removal of the Infrastructure Overlay and associated controls on the basis that development is not likely to occur as assumed in the assessment.

6. RESPONSE TO MICHAEL CAMPBELL (KĀINGA ORA)

6.1 Mr Campbell requests the removal of the Infrastructure Overlay in its entirety. Mr Campbells evidence generally references Mr Jaggard's evidence which he supports.

6.2 I do not have further comment specific to Mr Campbell's evidence and reference should be made to my responses to Mr Jaggard's evidence above.

7. RESPONSE TO GURVINDERPAL SINGH (KĀINGA ORA)

7.1 Mr Singh states the following in paragraph 10.5 of his evidence (emphasis added):

.....the removal of the ICO would not in itself have an adverse effect on the health and wellbeing of the Rivers. Rather, what is required are the appropriate checks and balances associated with permitted development thresholds to ensure that urban development contributes to positive effects on the Awa. Kāinga Ora consider that the use of water conservation measures such as low flow fixtures, in conjunction with the building consent and connections approval processes that currently exist, is adequate to address the Council's concerns of infrastructure capacity.....

7.2 In paragraph 5.23 above I stated my opinion that Infrastructure Assessments would likely be required for all proposed development if the Infrastructure Overlay is removed and the MDRS densities adopted. In this regard the Infrastructure Overlay provides a mechanism for checks and balances without imposing assessment requirements on low level development already reasonably provided for within current planned infrastructure.

7.3 It is my opinion that the proposed Infrastructure Overlay and associated controls represents an appropriate check and balance for development

as requested by Mr Singh, without strictly limiting development subject to detailed assessment.

- 7.4 In my previous evidence I state that removal of the overlay may be appropriate if a specific area is identified for higher density development, for which capacity can be planned for and implemented.
- 7.5 Waipā District Council has presented an alternative proposal in the rebuttal evidence of Mr Tony Quickfall which would remove the Infrastructure Overlay within a defined area surrounding the town centre of Cambridge.
- 7.6 I would support the alternative proposal because it will provide certainty for water and wastewater network planning while removing the current proposed restrictions on development. I note that additional water and wastewater infrastructure will be required over and above current planned infrastructure to accommodate this, which is yet to be defined in detail.
- 7.7 Areas outside of the alternative proposal would still need to be subject to limitations on development due to the predicted network capacity issues.

8. CONCLUSION

- 8.1 Hydraulic modelling and assessment was undertaken to identify potential network issues and the need for controls on development resulting from the MDRS. The assessment showed that the current planned water and wastewater network are likely to have significant issues if development is undertaken at a higher density.
- 8.2 The modelling and assessment were not intended to identify specific issues and remediation. Rather, the intent was to determine an appropriate permitted development level and a mechanism for the

assessment of requirements for development beyond the permitted level.

- 8.3 I acknowledge that the location, timing, and density of actual development is likely to differ from those in the modelled scenarios. However, it is not practical to assess future development in detail where the location of development is uncertain, which can have a significant effect on the location and scale of infrastructure.
- 8.4 In my experience, network modelling and planning is always based on a reasonable prediction of population and development considering other factors such as land zoning. Sensitivity is typically tested for the timing of development but not location unless specific information is available.
- 8.5 I note that the inclusion of the Infrastructure Overlay was not a question of development timing, but one of ultimate demand and network capacity.
- 8.6 Master plans are typically reviewed and revisited over time to reflect actual development and changes in demand. Development exceeding planned requirements are often subject to more detailed assessment to determine if they can be approved or if additional infrastructure is required.
- 8.7 The proposed Infrastructure Overlay does not necessarily limit development. It provides a mechanism for the assessment of higher density development without imposing requirements on lower-level development that broadly aligns with current planning allowances.
- 8.8 I do not support the removal of the Infrastructure Overlay in its entirety from greenfield or brownfield areas.

- 8.9 I would support the removal of the Infrastructure Overlay from specific areas where the level of permitted development and the constrained location will allow additional infrastructure requirements to be defined and planned for in an efficient manner.



Chris Hardy
Dated 19 April 2023

Appendix 1 – Updated and Revised report titled *‘Plan Change 26 – Water and Wastewater Infrastructure Assessment, 18 April 2023’* with tracked changes