BEFORE THE WAIMAKARIRI DISTRICT COUNCIL HEARINGS PANEL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of Submissions 8 and 250 to the Proposed Waimakariri District Plan

SUMMARY EVIDENCE OF DANIEL HAYDEN MCMULLAN ON BEHALF OF ANDREW J McALLISTER

22 July 2024

QUALIFICATIONS AND EXPERIENCE

1. My name is Daniel Hayden McMullan. I have previously provided a rebuttal statement of evidence (dated 3 July 2024) responding to the Council Officers' reports on stormwater matters at the Submitter's site at 1275, 1379, 1401 and 1401 Tram Road, Swannanoa. My rebuttal evidence sets out my qualifications and experience, and I confirm that these remain unchanged.

2. I confirm that I have prepared this evidence in accordance with the Code of Conduct for Expert Witnesses Code of Conduct for Expert Witnesses contained in Part 9 of the Environment Court Practice Note 2023.

SUMMARY OF REBUTTAL EVIDENCE FOR BOTH BLOCKS

3. I prepared the Tram Road Flood Risk Assessments for Blocks A and B dated 29 September 2023 and 14 December 2023 respectively.

4. I accept that there are groundwater resurgence issues in the downstream catchment. Given the groundwater resurgence issues, I propose that stormwater is not discharged to ground via soak holes but is managed via attenuation and retention with limited infiltration to ground. This would be sized for the 2% annual exceedance probability (AEP) rainfall event including the effects of climate change out to 2081-2100 (scenario RCP8.5).

5. Stormwater from roofs would be collected in appropriately sized rainwater roof tanks with a control office. These tanks are expected to be 30 m^3 in storage volume dependent upon future detailed design and the size of the dwelling. Two thirds of the tank's storage volume can be used as retention, with stored water available for residents to use for flushing toilets, doing laundry, and watering gardens etc. This would be an amended version of the Dual Purpose Tank shown on WDC's standard drawing. The retention volume would help minimise pressure on the catchment's water supply network.

6. Stormwater runoff that is discharged from roofs can be discharged across a wide area of land (i.e., 5 – 10 m) using a "level spreader" which prevents the concentration of stormwater discharges. The tank would have an overflow pipe and a minimum orifice size of 15 mm to reduce blockage risk.

7. Runoff from hardstand areas can be collected in filtration swales with control orifices to reduce the runoff rate. These are effectively elongated filtration basins providing filtration treatment and attenuation storage. Stormwater that filters through the swale's subsoil mix can be collected in subsoil drains and conveyed to the appropriate discharge location. The total attenuation storage volume in the filtration swales would be at least 1,600 m³ and 2,490 m³ at Block A and B respectively.

8. If on-site investigations indicate that the assumed 0.5 m depth of the filtration swale is not appropriate, the depth can be decreased and the filtration swale width can be increased to achieve an equivalent storage volume.

9. The first flush volume for Block A and B has been estimated to be 354 m³ and 589 m³ respectively based on the road and unsealed accessway's catchment area. This is less than the required attenuation storage volume next to the road which ensures that the first flush volume can be captured in the filtration swales and treated through a sand / topsoil mix with a design infiltration rate of 20 – 100 mm/hr. First flush water would then be collected in subsoil drains and would be conveyed to the appropriate discharge point.

10. On-site flood risk can also be appropriately mitigated by locating buildings away from overland flow paths and setting building finished floor levels to have appropriate freeboard above the 0.5% AEP flood event. Accessways can also be designed to ensure access to habitable dwellings is achievable in the 2% AEP flood event. These features can be designed to have a less than minor effect on neighbouring properties.

11. The proposed solution described in this evidence would:

    a. Decrease the volume of stormwater discharged to ground (due to the addition of impervious areas) thereby ensuring downstream groundwater resurgence issues are not exacerbated;
    b. Ensure that the post-development discharge rates are equal to or less than the site's pre-development discharge rates;
    c. Use the roof tank's retention volume to help mitigate the increase in runoff volume from the proposed subdivision; and
    d. Treat contaminated runoff from the road in filtration swales.

12. Overall, I consider that from a flood risk and stormwater perspective, there is no reason why the proposed zoning is inappropriate at these locations.