

SUMMARY OF EVIDENCE OF DAVID DELAGARZA ON BEHALF OF MARK AND MELISSA PROSSER

INTRODUCTION

1. My full name is David Delagarza. My qualifications and experience are set out in my Evidence in Chief.
2. This Summary of Evidence sets out the key points within my Evidence in Chief and Supplementary Evidence.

SUMMARY OF EVIDENCE

3. My evidence covers the areas of flood management, stormwater management, and the management of groundwater resurgence.

Flood Management

4. As indicated by the Waimakariri District Council flood mapping, the site is subject flooding, consisting of a series of shallow flowpaths that cross the site from west to east. The vast majority of this flooding is categorized as low hazard.
5. This flooding pattern is similar to most of the of the Waimakariri District Council.
6. Due to the low hazard, shallow nature of the inundation, and the low density of the proposed development, the site design proposes to manage on site flood risk through elevating floor levels above the floodplain with appropriate freeboard.
7. In order to ensure the proposed development does not have adverse effect on downstream properties, the site will be graded to ensure that there is no cross-catchment diversion of flowpaths. The proposed roading network will include high points that coincide with the location of existing ridges within the site.
8. The site's proposed stormwater management areas, which are the low points of the site, are proposed at the locations where flowpaths currently exit the site. This ensures that flowpaths are discharged from the site in the same manner as the existing condition.
9. Detailed flood modelling will be undertaken at the subdivision phase to fully demonstrate the outcomes described above.

Stormwater Management

10. The stormwater management design philosophy considers the currently-unknown infiltration suitability of the site. The design has considered extremes in potential outcomes – from full infiltration of all on site stormwater to zero engineered infiltration and full surface management of the stormwater.
11. A detailed groundwater investigation is proposed prior to completion of the subdivision phase to inform the infiltration suitability of the site and the nature of groundwater resurgence flows.
12. The site's design does not rely on infiltration, rather, this is provided as the ideal option in recognition of ECAN and WDC guidelines indicating that infiltration should be provided whenever possible.
13. Two stormwater management areas (SMAs) are proposed. These areas have been sized to provide either appropriate space for soakage (assuming conservative soakage rates) or traditional attenuation.
14. Primary stormwater treatment is proposed in roadside swales. Additional treatment can occur in first flush basins within the SMAs, if required. There is adequate room for first flush basins within the SMAs, in addition to any attenuation basins or soakpits required.

Groundwater Resurgence

15. The site has experienced groundwater resurgence during periods of high groundwater in the past. Groundwater resurgence has been an issue in the overall Mandeville North area at times resulting in flooding due to stormwater infrastructure that was not designed in anticipation of resurgent groundwater flows.
16. As part of the overarching groundwater investigation prior to the subdivision phase, it is proposed to undertake an assessment to identify the locations of groundwater resurgence, the potential flow rates, and an assessment of level of uncertainty in the assessed outcomes.
17. Where groundwater resurgence locations are identified, these areas will be protected from fill to ensure that groundwater flows are not diverted to other

areas. Groundwater flows will be directed to the stormwater network (i.e. roadside swales) for discharge downstream.

18. The results of the groundwater investigation will also inform the engineering design of the stormwater management system. This proposed system will provide excess flow capacity to carry resurgent groundwater flows in addition to design stormwater peak flow rates. The proposed stormwater management areas will also include features to bypass resurgent flows around treatment and attenuation facilities to ensure that they do not fill with groundwater and remain available to manage stormwater inflows.
19. Where there is uncertainty identified within the groundwater study, the proposed design will utilise appropriate safety factors to ensure that the design can accommodate the flows, regardless of the flow rate.
20. Overall, although groundwater resurgence flows are present on this site and throughout the overall Mandeville North region, I am confident that through planning for them in design, they can be managed in a way that does not adversely affect properties within, or adjacent to the development or further tax downstream stormwater infrastructure that is undersized for groundwater flows.
21. In summary, while there are a number of considerations that need to be accounted for in the design of the site, it is my strong opinion that all of these issues can be overcome using appropriate engineering principles. I am confident that the site can be developed in a way that protects people, property and the environment from adverse impacts resulting from flooding, stormwater, and groundwater resurgence.
22. Thank you again for the opportunity to present my evidence and I am happy to address any questions.

David Delagarza
22 July 2024