

BEFORE THE HEARINGS PANEL

IN THE MATTER

of the Resource Management
Act 1991

AND

IN THE MATTER

of the Proposed District Plan
for Waimakariri District

**HEARING STREAM 12C: REZONING REQUESTS (LARGE LOT RESIDENTIAL
ZONES)**

**SUPPLEMENTARY STATEMENT OF EVIDENCE OF NEERAJ PRATAP
(STORMWATER)**

ON BEHALF OF

ANDREW CARR (SUBMITTER #158)

5 JULY 2024

1. INTRODUCTION

- 1.1 My full name is Neeraj Prithvi Pratap.
- 1.2 I have previously provided a Statement of Evidence (dated 26 February 2024) regarding stormwater matters in respect of the Submitter's request for the rezoning of 308 Cones Road and 90 Dixons Road (**the site**). My qualifications and experience remain as set out in that Statement of Evidence.
- 1.3 I have been asked to review and provide comment on the s 42A report of Mr Buckley, which in turn relies upon advice from Council's Senior Civil & Geotechnical Engineer, Mr John Aramowicz (set out in Appendix D to the s 42A report). I have also reviewed and commented as appropriate on the answers of Mr Buckley to the Hearing Panel's questions.
- 1.4 I confirm I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2023 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this 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.

2. RESPONSE TO COUNCIL OFFICERS

- 2.1 The Officers' assessment of the site is set out in Section 5.4 of the s 42A report and in paragraphs 68 to 73 of Appendix D, being a memorandum written by Mr Aramowicz.
- 2.2 In his paragraph 68, Mr Aramowicz notes that the overland flow paths (**OLFPs**) and drains within the site "*need to be protected*" and should be identified on the Outline Development Plan (**ODP**). He reiterates this in his paragraph 73.
- 2.3 By way of background, OLFPs are the preferred route that stormwater will flow based on topography. They are based on elevations and do not take into account conveyance capacity. The OLFPs presented in Annexures B and C of my Evidence in Chief are generated using LiDAR.

- 2.4 In Figure 1 I have shown the location and nature of one of the modelled OLFPs. As shown by the photograph, the OLFPs can be shallow valleys where water is expected to accumulate and flow downgradient.
- 2.5 OLFPs are distinct from drains, which are a more significant feature. I show the location and site images of a drain in Figure 2.
- 2.6 I agree that drains need to be protected, and I confirm that these are identified on the ODP.
- 2.7 OLFPs were not shown on the submitted ODP, but I understand that the Submitter has been advised by Mr Buckley that the Council requires those OLFPs shown on Figure 4 of my technical report (Annexure C to my Evidence in Chief) to be included.
- 2.8 I do not agree that the OLFPs shown within the site on Figure 4 of my Annexure C need to be “*protected*” and as I noted in my technical reports (Annexure B to my Evidence in Chief), as part of any proposed development, engineered modifications and/or diversion of the OLFPs may be undertaken (Section 5 of my report). While I acknowledge it is necessary to ensure that OLFPs are properly addressed within any proposed subdivision, in my experience it is common that engineering solutions are devised which may change the route of OLFPs through a site, while also ensuring that the conveyance of stormwater is suitably addressed.
- 2.9 Accordingly in my experience, minor OLFPs within a site are not typically shown on an ODP. Major OLFPs and drains which convey flows through the site from upstream to downstream of the site are typically shown, and in this case, these are shown by the ‘existing drain’ layer on the ODP. However, in view of Mr Buckley’s advice I understand that the Submitter is willing to amend the ODP in this manner, and that a revised ODP will be produced that includes minor OLFPs.
- 2.10 In paragraph 69, Mr Aramowicz sets out that the stormwater attenuation basins proposed at the southeastern and southwestern corners of 90 Dixons Road are of “*indeterminate size*”, that the “*land area required by the conceptual attenuation basins sizes has not been determined*” and accordingly, he is “*unable to comment on whether the areas shown for stormwater management/attenuation on the ODP will be sufficient*”.

- 2.11 In Section 3 of my technical report (Annexure C to my Evidence in Chief), I set out that I have calculated a stormwater attenuation volume required for 90 Dixons Road. Based on assumed development maximum impermeable area of 20%, I assessed that 900 cubic metres of additional storage may be required.
- 2.12 While the manner in which this will be provided is a matter to be addressed through the subdivision design, such a volume would be accommodated by, for example, a basin that is 30m long by 30m wide and 1m deep, or a basin that is 43m long by 43m wide and 0.5m deep. The indicative areas shown on the ODP are each approximately 100m by 70m in size, and there are two basins shown on the ODP. The area shown on the ODP is therefore appropriate to provide storage capacity which I have calculated to be required.
- 2.13 Mr Aramowicz suggests that the areas shown for the basins should be annotated as being "*indicative only*". Since the areas shown are much larger than will be required in practice, I agree with this approach. I understand that the Submitter has agreed to this change, and that the basins are labelled in this way on the revised ODP.
- 2.14 In paragraph 234 of his s 42A report, Mr Buckley highlights that stormwater is required to be managed on-site to be no more than pre-development levels. I agree with his position. However in responding to the Hearing Panel questions on paragraphs 227 and 231, Mr Buckley sets out that it is not clear how the stormwater basins integrate with the OLFPs, and stormwater infrastructure downstream of the site.
- 2.15 Figure 3 shows a cross-section through the southeastern part of the site. As shown by the elevations, the site has a natural fall from west to east. Consequently, I consider that the site contours can be engineered during the subdivision design to convey flows to the proposed southeastern detention basin location.
- 2.16 The southwestern detention basin location is located at an existing depression within the site, as shown on Figure 4 of Annexure C in my Evidence in Chief. Again, this means that it would be straightforward to engineer the site contours to convey flows to this location.
- 2.17 Mr Buckley also raises that it is not clear how stormwater infrastructure will integrate "*downstream of the site*". I confirm that the stormwater

management solutions on site and described in my Evidence in Chief are based on attenuating post-development flows such that pre-development flows are not exceeded. Therefore, development facilitated by the requested rezoning will not have any material effects downstream.

3. CONCLUSIONS

- 3.1 I consider that the annotation of the stormwater basins being "*indicative*" addresses Mr Aramowicz's concern.
- 3.2 The drains are shown on the ODP as requested.
- 3.3 In my experience minor OLFPs are not typically shown on ODPs as their nature means they may be appropriately modified as part of the development design. However, I understand that to respond to the Council's request, the Submitter is willing to show them.
- 3.4 I also consider that my assessment above regarding the manner in which the OLFPs integrate with the stormwater basins addresses the additional issue raised by Mr Buckley.
- 3.5 On this basis, having reviewed the Officers' Reports, I remain able to support the submission for the site to be rezoned as LLRZ.

NEERAJ PRATAP

5 JULY 2024

Figure 1: Example of a Minor OLFP



Figure 2: Example of a Drain



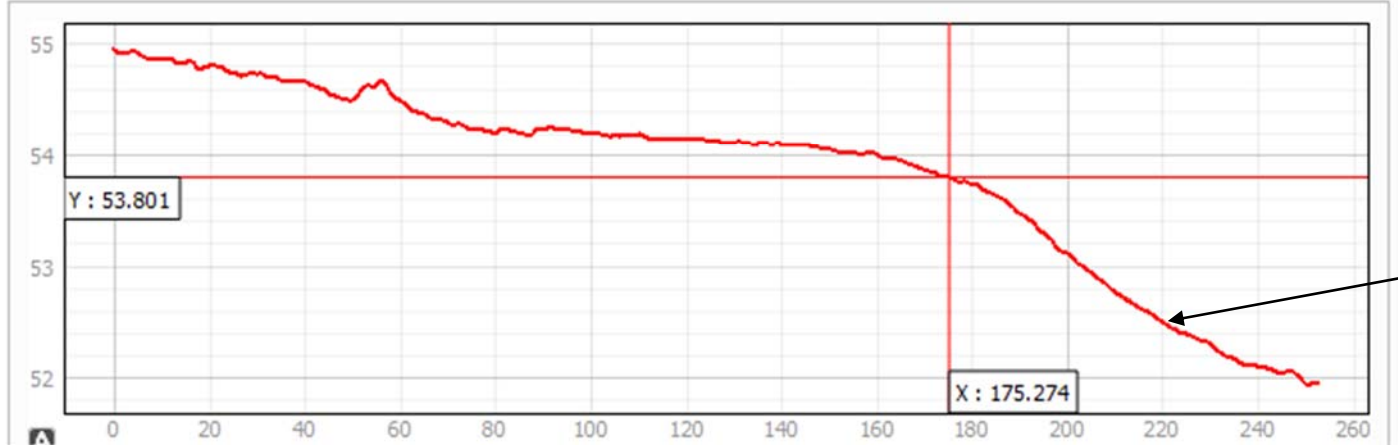
Images taken during the Site Visit 08 November 2022

Figure 3: Cross Section Through The Southeastern Part of the Site



Approximate location of proposed stormwater reserve

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Profile Table Settings



Approximate location of proposed stormwater reserve