Fast-track

Te Kāwanatanga o Aotearoa
New Zealand Government

MINUTE 6 OF THE EXPERT PANEL
Request for further information - Water
Ōhoka Residential Subdivision Expert Panel [FTAA-2606-1253]
30 October 2026

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[1] Pursuant to section 67 of the Fast-track Approvals Act 2024, the applicant is requested to provide the following further information listed in Appendix 1 and Appendix 2 to assist the Panel in assessing their application. This additional request for information focuses on water related matters.

[2] In accordance with section 67(2) of the Act the Carter Group Limited must:

(a) Provide electronic copies of the information or report requested; or

(b) Advise the EPA, with reasons that you decline to provide the information or report requested.

[3] Please provide the further information to the EPA at info@fasttrack.govt.nz within 10 working days of the project resuming under section 65 of the Act.

[4] If the information requested is not received, the Panel must proceed as if the request for further information has been declined.

[5] Please note, the information will be provided to the Panel, the applicant and every person who provided comments on the application. The information will also be made available on the Fast-track website.



Kate Barry-Piceno
Ōhoka Residential Subdivision Expert Panel Chair

Appendix 1 – Groundwater Information Requested

Part A – Engineering feasibility

This Part seeks information to confirm that the proposed community water supply and the stormwater management system can be constructed and operated as proposed, having regard to groundwater conditions on the site.

Water supply

(a) Section 5 of the Groundwater AEE provides design water supply rates for the individual retirement village units, but no allowance is noted for commercial activities at the village (such as offices, dining areas, laundry and cleaning facilities and garden irrigation). Please confirm whether additional water supply is required for these activities and quantify accordingly.

(b) The Supplementary Water Supply Memo (section 4.5) proposes step-drawdown testing of each new supply bore and a constant-rate test in at least one of the new bores, with at least one observation bore in the same aquifer, and states that the results should be used to update the interference and stream depletion assessments. We note that no testing of the shallow aquifer is proposed. Please propose shallow-aquifer testing (or explain why it is not required) sufficient to quantify interference effects on shallow bores, springs and stream depletion, and explain how the results would be used to refine the interference and stream depletion assessments for both construction (dewatering) and post-development conditions. Please also identify the actions that would be taken if testing shows effects greater than those predicted.

(c) The Groundwater AEE calculates the vertical travel time to the proposed supply bore depths using a porosity of 0.1, giving a travel time of approximately two years. The Panel's expert considers this value to be more consistent with bulk porosity than effective porosity; a value of 0.02 would give a travel time of approximately 0.4 years,

which is less than the one-year travel time required for microbial protection (source water risk management area Zone 2). Please re-assess the travel time using more conservative contaminant transport parameters and identify the consequences for source water protection and for a multi-barrier approach to the proposed supply.

(d) The Panel notes that the Supplementary Water Supply Memo (section 3) proposes that all new supply bores be screened deeper than 70 m, and that the Groundwater AEE notes that deeper strata (greater than 100 m) are worth exploring. However, the Panel's expert considers that the minimum bore depth of 60 m in proposed condition 3 of the community supply take is too shallow, and recommends instead installing the new deep supply bores to a depth of 100–150 m to provide greater source water protection. Please consider updating the depth, or clearly state the reasoning for not doing so, and identify any mitigations to manage potential requirements for greater microbial contamination protection.

(e) Section 7.5 of the Groundwater AEE notes elevated concentrations of dissolved metals in groundwater, but does not explain their possible causes. The Panel notes that the reported results are from shallow piezometers and are assessed against LWRP Schedule 5 surface water standards in the Dewatering and Dust Suppression Assessment. Investigate and report on the potential cause(s) of the elevated dissolved metals, their concentrations and trends, and, if needed, the feasibility of treatment.

(f) Please identify and assess the effects (including LWRP rules) on neighbouring land where a groundwater protection zone would extend beyond the site.

(g) Proposed condition 9 of the community supply take allows abstraction under the existing irrigation consents (CRC991022 and CRC991827) to continue, on land not yet issued with a section 224(c) certificate, until the final stage is completed, whereas the water balance, allocation and stream depletion assessments assume that

irrigation ceases, and the Dewatering and Dust Suppression Assessment states that the existing irrigation consents will not be exercised during the works. Please reconcile proposed condition 9 with that statement and, if irrigation is to continue during the build-out, assess the combined effects of the community supply, continuing irrigation, dust-suppression abstraction and dewatering during the staged build-out, including on surface-water allocation in the Ōhoka Stream (where the Canterbury Regional Council advises that allocation of about 648 L/s exceeds the 500 L/s limit), and, given that the Groundwater AEE states that the community supply take would technically be classified as 'moderate' under Schedule 9 of the Land and Water Regional Plan, confirm the consequences of that classification.

Design parameters for stormwater management

(h) Provide a longer-term assessment of historical shallow groundwater levels, considering all monitoring data available on or near the site. The Panel acknowledges the use of bore M35/0601 (1973–2024) and the 37 Tetra Tech Coffey standpipes in the Hydrology Assessment. This may be achieved by correlating the short records from the newly installed shallow monitoring bores (March 2025 onwards) with the longer-term record. Please also confirm whether the data from all 53 bores referred to in section 3.2.2 of the Groundwater AEE have been considered.

(i) The Panel notes that the Ōhoka Residents Association's hydrogeologist (Dr Rutter) considers that groundwater levels at the site are 'flashy' and could rise towards the land surface at any time of year, rather than following a winter–spring seasonal pattern, and that recent peaks exceed those recorded in the late 1970s. Please define the 'seasonal high groundwater level' above which SMA outlets are set (including the period of record and statistical basis) and its relationship to the maximum recorded levels, explain whether the

design levels should be raised to reflect the recent peaks, and provide groundwater data covering post-storm and wet-season conditions.

(j) In defining the seasonal high groundwater level, please also address: whether peaks were under-recorded, given that many piezometers were not read on 3 and 27 June 2025; whether the gap in the record at bore M35/0596 between 1986 and 1999 means that drought lows (such as 1997–98) are not captured; the absence of groundwater data for Catchments 10 and 11 (Table 7 of the Updated Stormwater Management Report); and the design groundwater level adopted at each SMA.

(k) Provide further information on how the SMAs have been designed in relation to managing effects on groundwater, including how the SMA depths and invert levels were derived relative to seasonal high and low groundwater levels, and how the SMAs will respond, and affect shallow groundwater levels, under high and low groundwater conditions. The Panel notes that the Updated Stormwater Management Report (section 7.2.2) states that wet ponds and wetlands will be up to 1 m to 1.2 m deep and that all basins will have a silt or similar liner, while the Groundwater AEE (section 7.2) and the AEE (paragraph 151) state that drainage water will infiltrate back to groundwater through the SMA basins and wetlands, and no proposed condition requires the SMAs to be lined. Please confirm whether the SMAs will be lined or will infiltrate, and, if lined, how the liners will be designed to resist hydrostatic uplift when groundwater is above the base of a basin that has been drawn down or emptied for maintenance. Please also address whether, in a groundwater discharge area, groundwater will enter the basins and wetlands and reduce their storage capacity, and whether the attenuation design (section 6.3 of the Updated Stormwater Management Report) allows for springs and for groundwater intercepted by the SMAs. Please also state whether each SMA is expected to be permanently wet or to dry out seasonally, quantify any losses through the liners when groundwater is below the

base of a basin, and identify the consequences for planting, treatment performance and maintenance.

(l) The Groundwater AEE (section 5.2) and the AEE (paragraphs 149–151) state that the road subsoil drains will be graded to discharge points within the SMAs, and the Groundwater AEE (section 7.2) acknowledges that these outlets may be submerged when there is ponded groundwater in the SMAs. The subsoil drains are intended to protect the road pavements when groundwater levels are elevated, which is when the SMAs are most likely to be full or subject to tailwater. Please explain how the subsoil drainage will function when the receiving SMA is at or above its permanent water level, full, or subject to elevated tailwater, including:

  (i) the invert levels of the subsoil outlets relative to each SMA's permanent water level and top water level, and to the tailwater levels expected in the receiving waterways;

  (ii) whether backflow from the SMAs into the subsoil drains and pavement layers will occur, and any backflow prevention proposed;

  (iii) the effect on pavement performance, and on the groundwater drawdown that the subsoil drains are intended to provide, during prolonged high groundwater; and

  (iv) whether the subsoil drain inflows (up to 10 L/s sought) have been included in the sizing of the SMAs, given that the Updated Stormwater Management Report does not refer to them.

(m) Describe the long-term operation and maintenance requirements for the SMAs as they relate to groundwater quality and quantity, including testing for bed clogging and contaminant accumulation, the frequency of that testing, and the criteria that would trigger excavation, disposal and replacement of bed materials and liners (if lined). The Panel notes that the proposed operation and maintenance plan condition covers maintenance responsibility and sediment removal, but not groundwater-quality testing or liner replacement (if relevant).

Part B – Outcomes

Shallow groundwater effects – internal

(n) The Wastewater Responses Memo (section 1.4) states that the 2022 groundwater resurgence period used to size the 251 m³ wastewater storage represents a worst case. As the Ōhoka Residents Association's hydrogeologist (Dr Rutter) notes that groundwater levels have been higher than in 2022 on several occasions, please justify that statement and assess the effect of higher groundwater levels on inflow and infiltration and on the storage required.

(o) Much of the assessment focuses on off-site effects. Please assess the effects of shallow groundwater on liveability and risk within the site, including:

  (i) the areas, and number of lots, where seasonal high groundwater is expected to be shallow (for example, less than 1 m below finished ground level) or to reach the ground surface;

  (ii) the effects on building foundations and floor levels, lawns and outdoor living areas, accessways and services, and any restrictions that would apply to lots; and

  (iii) the measures proposed to manage these effects (such as filling or subsoil drainage), their reliance on ongoing maintenance, who would own and maintain them, and the consequences if they fail.

(p) The Infrastructure Assessment (section 5.4) states that specific pavement designs may be required where pavements are close to groundwater. Please identify where this applies, the design subgrade conditions assumed under high groundwater, and how inflow and infiltration to wastewater laterals and private pipework (including in the retirement village) will be managed.

Shallow groundwater effects – external (springs, waterways and neighbouring bores)

(q) Figure 3 of the Groundwater AEE presents generalised catchment-

scale groundwater flow directions, and these conform to the general understanding of groundwater flow directions in Canterbury, but the figure does not state how these were derived or which aquifer(s) they represent. Please provide information, at the subdivision scale, on groundwater flow patterns and directions at different depths, including the differences between the shallow and deeper aquifers, and whether any such differences could result in adverse effects from the Project (including effects on Ōhoka Stream and the springs).

(r) The Hydrology Assessment (section 3.1) concludes, from two piezometer pairs (P04/P05 and P16/P20) screened within the upper 3 m, that there is no evidence of a significant upward gradient, and the Groundwater AEE states that there is no data to confirm the relative pressures in the shallow and deeper strata. Please explain how this conclusion is reconciled with the permanent springs and gaining streams on the site, identify the locations of the two piezometer pairs relative to the springs and the SMAs, and state what the implications would be for SMA design and spring flows if upward gradients are present locally.

(s) The assessments of interference effects on neighbouring bores and stream depletion rely on aquifer properties derived from a test on the Waimakariri District Council's deep Ōhoka supply bore, which may not reflect on-site conditions. Section 3.2.4 of the Groundwater AEE notes that shallow aquifer tests exist in the area, but a shallow aquifer transmissivity derived from the Bal equation has been used instead. Please:

(i) given that the adopted shallow aquifer transmissivity of 975 m^2/day is conservative for interference effects but not for stream depletion (as a higher transmissivity gives greater depletion), re-assess stream depletion using the pump-test values, or validate the adopted value by testing, noting that many of the potentially affected neighbouring bores are in the shallow aquifer; and

(ii) confirm whether the interference observed in monitoring bore P02 (page 7 of the Groundwater AEE) can be used to derive aquifer parameters, and if so, provide that analysis.

(t) The site is complex, with multiple streams, drains and springs, and the simplifying assumptions underlying analytical methods may not hold. Provide an assessment of whether the assumptions required for the analytical methods used are appropriate in this setting. This should address the site's position in a groundwater discharge zone, where groundwater is a primary design variable; recharge from Eyre River flood flows lost to groundwater, and the resulting delayed and prolonged spring response (the Hydrology Assessment states that spring discharge is expected to be dominantly rainfall derived); and how uncertainty in the groundwater and surface water predictions has been identified, tested and bounded.

(u) The Hydrology Assessment (section 4.2.1) proposes trench backfill and low-permeability plugs to avoid diverting shallow groundwater away from springs. Please explain how the most sensitive areas will be identified given the uncertainty in the existing geological information, and the effect of infilling drains and depressions and realigning waterways on groundwater-surface water interaction, noting that realigned channels may not have the same interaction as the existing channels.

(v) Assess how raising ground for building platforms, additional hard surfaces and subsoil drainage in a groundwater discharge zone will change groundwater levels, and combined groundwater and surface water flows, on neighbouring land. The Change in Water Balance Assessment addresses changes in recharge and spring flows. Please also assess the change in groundwater levels in response to rainfall, storms and river flows, and its implications for flooding on and off the site.

(w) The Hydrology Assessment (section 4.4) addresses downstream effects on water users and flooding, and section 4.3 addresses

wetlands on the site, but neither assesses hydrologically connected wetlands beyond the site boundary. Please assess the effects of changes in groundwater discharge, spring flows (including the reduction in the non-irrigation season site water balance of approximately 11.2 L/s estimated in the Change in Water Balance Assessment) and the surface water regime on downstream wetlands and on Ōhoka Bush, including the ecologically significant wetlands along Mill Road identified by the Canterbury Regional Council and the Waimakariri District Council. This should extend the spring-flow evaluation beyond the site and identify any monitoring and response measures.

(x) The Dewatering and Dust Suppression Assessment states that the dewatering methodology is currently unknown and assesses abstraction from a single point at 75 L/s for 90 days, whereas consent is sought for dewatering for up to six months a year over up to 15 years. Please describe the likely dewatering methods and their timing relative to high groundwater, the destination and quality of the dewatering discharge (including discharge to land and any contaminated soils), and define the downstream flooding that would trigger cessation under proposed condition D6.

(y) Assess the effects of the Project on neighbouring private bores, including domestic, stock and garden bores. Please:

  (i) assess construction dewatering drawdown over the duration sought (up to six months a year for up to 15 years) rather than 90 days, including during summer low groundwater, and respond to the comments that several bores would exceed the Schedule 12 drawdown limit;

  (ii) explain the basis for limiting the direct assessment to bores with less than 6 m of remaining drawdown and for assuming that some bores are not used, and extend the assessment to stock, garden and closer domestic bores;

  (iii) confirm whether bore M35/0305 is within the site, and provide

property-specific assessments of water level and water quality (including contamination from earthworks, stormwater and wastewater) for the bores identified in the comments, including at 239, 308, 324 and 336B Whites Road and 215 and 251 Bradleys Road; and

(iv) propose baseline surveys of neighbouring bores before works begin, monitoring, interference triggers, stop-work provisions, an alternative supply and make-good arrangements, including a condition requiring investigation, assessment and remedial action (including an alternative supply where needed) following a validated complaint from a neighbouring or other affected party.

(z) Identify the springs and seeps reported in the comments that are not mapped in the application (including at the Mill Road/Bradleys Road corner, 164 Bradleys Road, 401 Whites Road and the eastern part of the site historically known as 'Springlands') and spring BW24/1013 referred to in the Construction Earthworks Spring and Groundwater Monitoring Plan, assess the effects on springs on neighbouring properties (including 336B Whites Road), and explain how springs or seeps that emerge after development would be managed on residential lots.

(aa) The Construction Earthworks Spring and Groundwater Monitoring Plan provides for monitoring for one year after each stage, whereas proposed earthworks condition 9 refers to up to two years after completion of works, and the plan contains no numeric trigger levels. Please provide trigger levels for groundwater levels and spring flows and explain how they have been derived, identify the specific mitigation that would follow an exceedance and demonstrate that it would be effective, confirm the monitoring duration after the final stage, and explain whether the four 2025 gauging rounds provide an adequate baseline. Please also describe the shallow groundwater monitoring proposed during the operational life of the SMAs where

depth to groundwater is critical to their design and operation, during both wet and dry periods.

Appendix 2 – Stormwater and Flood Risk Information Requested

Part A – Engineering feasibility

Sizing basis

(a) Identify the design rainfall temporal patterns, and any historical or ensemble rainfall events, that have been tested in sizing the detention systems. Explain how the choice of temporal pattern affects the permissible discharge rate, the overall detention volume and the likelihood of exceedance, noting that design storms that nest high-intensity bursts can reduce the effective margin of safety for detention design. Please also confirm performance across a broader range of durations and events including those required by the WDC Engineering Code of Practice (up to 72 hours).

(b) Describe the hydrological approach and assumptions adopted for the detention sizing, including how rainfall losses over pervious areas have been represented. The Updated Stormwater Management Report states (section 6.3.1) that attenuation volumes were estimated using an HEC-HMS model based on curve numbers and initial abstraction but also adopts fixed runoff coefficients (C values) (Table 4), and provides no curve numbers, initial abstraction or other HEC-HMS inputs. Please confirm which method has been used for each calculation and provide sufficient information for the work to be verified.

(c) Where runoff coefficients selected for peak-flow estimation have been applied to estimate runoff volumes, demonstrate that they are suitable for that purpose, or recalculate the volumes using a rainfall-loss method suitable for estimating runoff volume.

(d) Explain how the detention volumes have been represented and sized, and how tailwater effects have been accounted for, noting that section 6.4 of the Updated Stormwater Management Report states that the HEC-HMS basin sizing does not account for tailwater effects and

appears to exclude tailwater from the TUFLOW results.

(e) Table 4 of the Updated Stormwater Management Report includes the stormwater management areas (SMAs) within areas assigned runoff coefficients of 0.65 and 0.47. Please confirm that rainfall falling directly onto the SMAs has been included in the calculations and sizing and provide a rationale for the runoff coefficients used.

(f) Table H1 of the Updated Stormwater Management Report counts 3,210 m^3 of storage in Catchment 10 (polo field) and Table 10 relies on it to attenuate Catchment 6, but section 6.3.1 states that the polo field has not been represented in the HEC-HMS model or any stormwater calculations. Please provide the polo field storage calculation, explain how the polo field will function as both a playing field and an attenuation area in more frequent events, and explain how that storage will be secured for the future, given that Lot 9003 is not to vest.

(g) The Panel notes that stormwater from the future retirement village (Lot 9001, within Catchment 6) is not part of this application and will require a separate operational stormwater design (proposed regional condition 10), but that the village will have a significant impervious area and proposed land-use condition 7 disapplies the General Residential building coverage rule (GRZ-BFS2). Please explain the imperviousness assumed for Lot 9001 in the stormwater and flood assessments, how treatment and attenuation for the village will be provided (including the land area required), and how this relates to the reliance on storage in Catchment 10 to attenuate Catchment 6.

(h) Assess the sensitivity of detention performance to higher impervious coverage than assumed in the design. Explain how the design imperviousness assumptions will be maintained through detailed design, construction and subsequent property alterations, including relevant approval processes, and how additional runoff would be managed where exceedances are possible.

Interaction with groundwater

(i) Explicitly address the potential for groundwater levels to rise above SMA invert levels following antecedent rainfall or during long-duration (greater than 24-hour) rainfall events, and test the sensitivity of the scheme to plausible groundwater conditions. Please indicate for each of the stormwater management devices, the invert, existing and proposed ground levels, assumed groundwater level, normal water level (if any), design water level (for a range of events if for attenuation), and the discharge tailwater level.

(j) Document how the proposed rain gardens and biofiltration systems will operate under high-groundwater conditions, including rainfall that occurs after significant or prolonged prior rainfall has elevated groundwater levels across the site.

Hydraulic operation

(k) Demonstrate that the combined operation of the first-flush basins, wetlands, detention areas and receiving waterways, including time-varying tailwater, outlet submergence, backflow, spillways and bypasses provides the intended treatment and attenuation performance without worsening downstream flooding. Report maximum water levels and storage utilisation, including where restricted discharge could cause earlier overflow, and distinguish between permanent water storage, treatment storage (extended detention) and temporary flood storage. This should include tailwater effects on the pipe network upstream of the SMAs and on proprietary devices and rain gardens, the attenuation volume lost when tailwater influences the SMAs, and the effect of high groundwater raising receiving-waterway levels. Representative hydraulic grade lines through the system should be shown.

(l) Reconcile Table 11 of the Updated Stormwater Management Report showing receiving-water levels above the permanent water level of Wetlands 9C-1 and 9C-2, SMA 9A and others for extended periods,

with section 6.2.2, which states that the design intent is that there be no tailwater effects from the existing drains on the wetlands.

(m) For the SMAs test plausible storm sequences in which storage has not fully recovered at the start of an event (including the effect of tailwater conditions), to demonstrate the sensitivity of the scheme to the volume of water already held in detention storage.

Part B – Outcomes

Hydraulic neutrality

(n) Compare pre-development and post-development discharges (including volume) for matching rainfall durations, temporal patterns and climate scenarios, and report the results at each downstream discharge point. Table 6 of the Updated Stormwater Management Report reports pre- and post-development peak flows for the 1-, 6-, 12- and 24-hour durations (10% and 1% AEP) at catchments C1 to C4, but not volumes, and the pre-development peaks in Table 3 differ from those in Table 6 for the same catchments; please explain which governs the outlet sizing. Include event-specific pre- and post-development comparisons to identify any increases in discharge.

(o) The Updated Stormwater Management Report states (Table 3, note 2) that the pre-development flows used to set the permissible discharge include climate change (HIRDS V4 RCP8.5 to 2100), which would allow discharges to exceed present-day rates. Please:

  (i) justify setting the permissible discharge against future-climate rather than present-day pre-development flows;

  (ii) provide comparisons that distinguish the effects of the development from the effects of climate change, measured against present-day conditions; and

  (iii) adopt a consistent climate-change basis across the stormwater and flood assessments.

(p) Test representative wet and dry antecedent conditions and

demonstrate that the scheme does not increase downstream flooding during events in which runoff from the existing pervious areas would be relatively low. This should include sensitivity to assumed groundwater conditions.

(q) Assess the sensitivity of SMA sizing to 48-hour and 72-hour rainfall events and demonstrate that storage is not exhausted before the critical downstream flood peak occurs.

Off-site flood effects

(r) The current SMA assessment only looks at peak discharge at the downstream site boundary, and the detention systems have been assessed in isolation from the flood model, so the effect of the discharge on downstream areas of flood risk has not been tested. Please integrate the proposed SMAs into the TUFLOW flood model hydrology, for example by using pre- and post-development inflow hydrographs that represent the detention systems' operation. The combined effect of the discharge hydrographs can then be assessed together with downstream flows, including any volumetric effects. Please report the hydrographs, time to peak and flood duration at each outlet and at the downstream areas of flood risk. These should include Silverstream and Kaiapoi, where critical durations are longer than on the site. Please also explain how repeated flooding in the Ōhoka–Mandeville area, and the constraints of the No. 10 Road / Ōhoka Stream drainage, have been taken into account.

(s) Model a broader range of event durations and magnitudes, to demonstrate that the proposed stormwater system performs across a wide range of event magnitudes, that the flood storage is utilised in smaller events, and that the risk of downstream stream erosion is not increased, including:

(i) the June 2014, July 2022 and July 2023 historical rainfall profiles, scaled to the relevant rainfall depth–duration–frequency values, alongside the synthetic design storms; and

(ii) more frequent events, including the 50% AEP (2-year ARI), 20% AEP (5-year ARI) and 10% AEP (10-year ARI) events, with the primary network and SMAs operating, to demonstrate that off-site effects comply with the WDC Engineering Code of Practice across events up to the design event.

While the Panel notes that the Flood Effects Report (section 7.0) states that the flood model is not at a suitable level of detail for events smaller than the 50-year ARI, and has been run for the 50-, 100- and 200-year ARI events only (Table 6), we do not consider this sufficient to evaluate the effects of the proposal.

(t) Please provide plans of flooding within the site for a range of events, showing depths in 50 mm bands for all depths greater than 50 mm, and confirm that stormwater management within the site results in internal flood effects compliant with the WDC Engineering Code of Practice.

(u) For existing properties outside the site, please provide a property-by-property assessment of the predicted changes:

(i) pre- and post-development flood duration, and the duration of loss of road access, for all modelled events; and

(ii) in flood level against existing flood depth, freeboard, conveyance and land use.

Water quality

(v) Document the basis for selecting the proposed stormwater treatment systems, including their respective benefits, limitations and suitability for the site.

(w) Document the design basis for the proposed ponds to maintain adequate water quality following long, dry, hot periods, with particular regard to elevated water temperatures and low dissolved oxygen concentrations.

(x) The water quality mixing assessment (Appendix C of the Updated Stormwater Management Report) assesses only the Ōhoka Stream

Tributary, using an average baseflow of 59.5 L/s from the February and November 2025 gaugings, and assumes flowing water at all discharge locations. Please:

(i) justify the 59.5 L/s baseflow against the lower summer flows measured in February 2025;

(ii) assess the discharges to each of the other receiving waterways, including the South Branch, the spring and seep channels (with baseflows of about 2–10 L/s) and reaches with no permanent flow;

(iii) identify the location of each discharge point, and the 7DMALF and wetted channel width at each, define the Schedule 5 mixing zone for each discharge, and assess whether the mixing zones overlap or coalesce, or whether a discharge enters a reach without permanent flow (where no mixing zone applies), and if so the combined effect and the point at which compliance with Schedule 5 and proposed regional condition 5(f) would be assessed; and

(iv) reconcile the conclusion in the LWRP Compliance Assessment (Appendix 36) that the discharge complies with condition 3 of Rule 5.93 because the Schedule 8 limits can be achieved with the statement in Appendix C that Schedule 8 does not set limits for the key contaminants of concern and that zinc and copper will exceed the Schedule 5 limits at the point of discharge, and confirm the activity status and the basis on which the discharges meet the LWRP and section 107 of the RMA.

(y) Table 5 of Appendix C of the Updated Stormwater Management Report reports expected discharge quality by treatment type rather than by discharge point, and shows total zinc exceeding the LWRP limit of 0.008 mg/L for every treatment type (0.012–0.0192 mg/L) and total copper exceeding the limit of 0.0014 mg/L for swales (0.0017 mg/L), with compliance relying on reasonable mixing and a period of about 4 hours per event in which the limits are not expected

to be met. For each discharge point, please assess the frequency and duration of exceedance of the LWRP zinc and copper limits and of the updated ANZG default guideline values (released in September 2026, as noted by the Department of Conservation), including the chronic effect of repeated pulses in low-dilution headwaters, and justify the reliance on reasonable mixing.

(z) Table 5 of Appendix C shows that catchments treated by swales and detention basins (Catchments 2A, 2B, 5B, 6 and 10) have the poorest expected discharge quality (for example, total suspended solids of 12.6 mg/L and total zinc of 0.0192 mg/L, compared with 6.3 mg/L and 0.0128 mg/L for first-flush basins and wetlands). Please explain why first-flush basins and wetlands are not used in those catchments to give better treatment, provide the number and arrangement of the proprietary devices and rain gardens proposed (which Table G1 of the Updated Stormwater Management Report records as to be confirmed as part of design development), and, given that mean treatment efficiencies from published ranges have been adopted, identify the treatment efficiency at which the discharge targets would be exceeded.

(aa) Please confirm whether the condition 37 trigger limits for copper and zinc are intended to apply to the dissolved or total fraction.

(bb) Table 4 of Appendix C gives a range of removal efficiencies for proprietary devices (for example, 75–95% for trace metals), based on a Stormwater360 StormFilter® device for comparison purposes. Please confirm the removal efficiencies adopted for the proprietary devices, justify them (particularly for metals, including the dissolved fraction), and state whether they are supported by independent certification or performance testing.

(cc) Assess whether the stormwater discharges would cause a conspicuous change in clarity, or fine-sediment deposition, in the spring-fed receiving waterways, having regard to the Schedule 5 clarity standard.

(dd) Proposed operational stormwater conditions 5(e), 30(b) and 37 set a

TSS limit of 50 mg/L, whereas Table 5 of the Updated Stormwater Management Report predicts discharge concentrations of 2.1–12.6 mg/L and the Aquatic Ecology Memo relies on concentrations below 20 mg/L to conclude that there will be no conspicuous change in clarity. Please justify the 50 mg/L limit or propose a limit consistent with the assessed discharge quality. During construction, please explain whether discharge of dewatering water to land is feasible in wet periods on the poorly drained soils; where the sediment removal pond will discharge when it overflows (and reconcile its location, which is shown adjacent to Whites Road in the Site Management Plan and at the north-east of the site in the AEE); and how sediment-laden runoff will be kept out of the spring-fed waterways, including the adequacy of the 50 mg/L suspended solids limit.

(ee) Clarify if any of the site's soils that will be exposed to stormwater are dispersive in nature, and if so, how turbidity issues will be managed.

Part C – Model basis and consistency

(ff) The Flood Effects Report (Table 3) assigns imperviousness to buildings and roads (100%), developed lots (70%) and developed large lots (30%), with no infiltration applied to impervious areas, but assigns no imperviousness to existing built-up areas (settlement). Please clarify how runoff from impervious surfaces in existing urban areas has been represented, and reconcile the 30% imperviousness adopted for large lots with the 20% maximum on-lot imperviousness assumed in the Updated Stormwater Management Report (Table 4).

(gg) Waimakariri District Council's reviewer (DHI) reports that the modelled 1% AEP flood levels are about 350–400 mm lower than those from the Council's South Ashley model, despite the later climate horizon adopted, whereas section 9.0 of the Flood Effects Report states that the results of the district-wide model "differ marginally". Please explain the difference.

(hh) Section 8.2.3.1 of the Flood Effects Report reports overall less flow,

and therefore less volume, discharging from the site at Culv 05 in the post-development scenario, despite the increase in impervious area and the assumption that the SMAs are full. Please explain this result.

(ii) Report the results for current-climate and future-climate events separately, so that the Project's performance under the current climate and a future climate scenario can be considered together.

(jj) The model has been calibrated primarily to a single event (July 2022) at the Cust Main Drain gauge at Threlkelds Road, to which the site's catchment does not appear to drain, with the flow response represented solely by surface runoff processes. Please:

(i) explain how groundwater and subsurface (baseflow) contributions to the flood response have been accounted for, and the effect of representing them as surface runoff on the calibrated roughness and infiltration parameters, the critical duration and the sensitivity of downstream areas to increased impervious coverage;

(ii) confirm if the calibrated runoff rates from the flood model have been used to set permissible discharge rates from the development; and

(iii) report the peak flow predicted at the calibration gauge for each design storm and compare it with the gauge's flood-frequency estimates, to demonstrate whether rainfall–flow AEP equivalence has broadly been achieved (for example, whether the peak flow generated by the 1% AEP design rainfall is smaller or larger than the estimated 1% AEP flood peak at the gauge).

(kk) Groundwater is likely to reach the ground surface at times in places and does so permanently in the spring areas. While the flood model uses Horton infiltration losses calibrated to the July 2022 event, no sensitivity testing of the infiltration parameters was undertaken. Please provide sensitivity testing of the modelled off-site flood effects to: high and low groundwater and infiltration assumptions; SMA initial water levels; and the condition and capacity of the downstream

drains relied on, comparing what has been assumed with their actual (surveyed) condition. Please also identify whether any off-site culvert or channel upgrades beyond the site entrances are needed and form part of the proposal (for example on Whites Road, Bradleys Road, the Mill Road drain or the South Ōhoka Stream).

(ll) Identify and resolve the discrepancies between the culvert dimensions adopted in the Flood Effects Report (Table 5) and those proposed in the AEE (Tables 6 and 7), including culverts CULV_06, CULV_07, CULV_08, WHITES_01 and BRADLEYS_02, and amend the flood modelling if required.