BEFORE INDEPENDENT HEARING COMMISSIONERS
AT CHRISTCHURCH

I MUA NGĀ KAIKŌMIHANA WHAKAWĀ MOTUHAKE
KI ŌTAUTAHI

UNDER the Resource Management Act 1991

IN THE MATTER of submissions and further submissions on Proposed Plan Change 14 to the Christchurch District Plan (PC14):

SUBMITTER Danne Mora Limited (#903)

STATEMENT OF EVIDENCE OF JAMIE VERSTAPPEN - INFRASTRUCTURE

Christchurch
Solicitor acting: G Cleary
Level 9, Anthony Harper Tower
62 Worcester Boulevard
PO Box 2646, Christchurch 8140
Tel +64 3 379 0920 | Fax +64 3 366 9277
Email: gerard.cleary@ah.co.nz

Anthony Harper

1 SCOPE OF EVIDENCE

1.1 My full name is Jamie Michael Verstappen. I am a Director and Civil Engineer at Davie Lovell-Smith Ltd.

1.2 I hold a Bachelor of Civil Engineering from Canterbury University (BE (Civil) Hons). I am a chartered member of Engineering New Zealand (CMEngNZ) and a Chartered Professional Engineer (CPEng).

1.3 I have 12 years' experience in the civil engineering field and 9 years' experience in land development in Canterbury.

2 SCOPE OF EVIDENCE

2.1 My evidence is presented on behalf of Spreydon Lodge Ltd and addresses the implications of the rezoning proposed within PC14 on the Halswell Commons and Meadowlands developments (the **Site**) regarding stormwater management and wastewater.

2.2 In preparing my evidence I have reviewed:

(a) Applicable parts of the Section 42A Report prepared by Mr Ike Kleynbos dated 11th August 2023;

(b) The Statement of Primary Evidence of Robert Brian Norton on behalf of Christchurch City Council;

(c) The Statement of Primary Evidence of Michele Ann McDonald on behalf of Christchurch City Council; and

(d) Relevant background s 32 documentation.

3 CODE OF CONDUCT

3.1 I have read the Environment Court's Code of Conduct for Expert Witnesses, contained in Part 9 of the Environment Court Te Kōti Taiao o Aotearoa Practice Note 2023, and agree to comply with it. My qualifications as an expert are set out above. Other than where I state that I am relying on the advice of another person, I confirm that the issues addressed in this statement of evidence are 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.

4 STORMWATER MANAGEMENT

4.1 The Halswell Commons and Meadowlands developments encompass approximately 55 hectares of land located between Halswell Road, Hendersons Road and Sparks Road in Halswell Christchurch. These developments have

been progressively constructed by Spreydon Lodge Ltd in stages for the past 10 years. 50% of the Spreydon Lodge residentially zoned land is now developed with another 20% currently being consented for development.

4.2 There are two stormwater facilities located within the Site. These facilities provide treatment and attenuation for stormwater from both the Spreydon Lodge Ltd land and 114 hectares of land upstream, which is separated into two catchments. One of these stormwater facilities is complete and the other is partially complete. Stormwater catchment plans are attached as Appendix A.

4.3 It is important to note that although only one of the facilities is completed, the construction undertaken to date is part of an overall integrated design for the catchment undertaken for the current land zoning.

4.4 An agreement is in place between Spreydon Lodge Ltd and Christchurch City Council to apportion the cost of these facilities between both parties. This agreement details the cost apportionment based on runoff calculated for the current land zoning, as agreed with Council.

4.5 All stormwater infrastructure which has been installed to date has been designed to cater for the agreed catchment and runoff characteristics of the current zoning.

4.6 Any rezoning of land to HRZ within each catchment will lead to an increase in stormwater runoff, which in turn will require an increase in treatment and attenuation capacity. There is currently no runoff characteristics specified for a High-Density Residential zoning (HDRZ) within the Council stormwater standards however it is expected these will be similar to the Business Zone characteristics, as outlined in the CCC Waterways Wetlands and Drainage Guide: Part B. As such the runoff coefficients for Business Zoning have been adopted for calculations. This approach has been agreed with Council's Senior Stormwater Planning Engineer, Brian Norton.

4.7 The Council's preferred method for treatment and attenuation for large catchments in the Halswell area is using first flush treatment basins and retention basins. Other options are available for treatment and attenuation, for example proprietary treatment devices and tank storage, however these are significantly more difficult and costly to monitor and maintain.

4.8 The majority of land within each catchment is either already developed, has been consented for development or currently has an application being processed by Council. As such there is limited opportunity to introduce further land allocations for stormwater management upstream of the Site.

4.9 Given the above, the rezoning of land to HDRZ within each catchment will require an increase in treatment and storage capacity at each of the stormwater facilities located within Spreydon Lodge Ltd land.

4.10 The required basin storage capacity for three scenarios has been calculated in Appendix B: current zoning, PC14 notified zoning and s42A recommended zoning. These calculations are summarised as follows:

(a) Stormwater Catchment 1

(i) Current stormwater retention required – 50,900 m^3

(ii) Stormwater retention required by the HDRZ zoning as notified by PC14 – 56,774 m^3 (11% increase)

(iii) Stormwater retention required by the HDRZ zoning as recommended in the s42A Report – 59,464 m^3 (17% increase)

(b) Stormwater Catchment 2

(i) Current stormwater retention required – 43,728 m^3

(ii) Stormwater retention required by the HDRZ zoning as notified by PC14 – 46,970 m^3 (7% increase)

(iii) Stormwater retention required by the HDRZ zoning as recommended in the s42A Report – 52,220 m^3 (19% increase)

4.11 This increase in storage requirement will require the designed/constructed basins to be extended within the Spreydon Lodge Ltd land. The loss of land as a result of these additional storage requirements cannot be accurately quantified without undertaking a full stormwater design for the facility. However, considering the shallow groundwater table, shallow gradients and fixed outfall levels an appropriate estimate of land required for stormwater retention is $2m^2$ per m^3 of retained volume.

4.12 For each scenario this equates to an increase in area of:

(a) 1.2 Hectares for Facility 1 and 0.65 Hectares for Facility 2 for the PC14 notified zoning

(b) 1.7 Hectares for Facility 1 and 1.7 Hectares for Facility 2 for the Section 42A recommended zoning.

(c) Indicative additional basin areas for each scenario are shown within the Appendix A plans.

4.13 The proposed rezoning within the catchment will increase both the stormwater flow rate off site and total stormwater volume by increasing the proportion of hardstand within the catchment. This will increase the flood hazard for areas downstream of the Site, particularly land adjacent to the Hendersons Road Drain, Cashmere Stream and Heathcote River where there are known flooding issues.

4.14 To mitigate this increase in flow rate a longer drawdown period would be required which in turn would lead to further increases in on site storage capacity. Given the impermeable nature of local soils, there is no way to mitigate the increase in the total stormwater volume to be managed.

4.15 Comprehensive investigation into the downstream effects of this increase in stormwater discharge will need to be undertaken if development at a at higher density is to occur within the catchment. This investigation will need to include updating Council's Natural Hazard Mapping for flooding as a result of any development density increases.

4.16 The results of such an investigation could be used to determine whether an increase in the drawdown timeframe is required to mitigate the downstream effects. If an increase is required, this would further increase the size of the stormwater facilities located within Spreydon Lodge land, additional to the increases detailed above.

5 WASTEWATER

5.1 The increase in density presented by PC14 will lead to an increase in the volume of wastewater discharge from within the Site and wider catchment.

5.2 All sewer infrastructure installed within recently developed land has been designed to cater for a development density of 15 lots per hectare. This includes a large pressure main installed along the alignment of Monsaraz Boulevard between Sparks Road and Halswell Road. By introducing higher density development within the catchment there will likely be a need to upgrade sewer pipelines which have only recently been installed.

5.3 This opinion is shared by Council Wastewater Asset Planner Michele McDonald where in her evidence she states:

`Greenfield Areas that are serviced by infrastructure that was implemented within the past 10 years. Infrastructure servicing Halswell, Westmorland, Casebrook and Prestons were sized to support a residential household density of 15 households per hectare. MDRS design standards will increase the demand and will trigger the need for new infrastructure to be upgraded. In the case of pipes, this would mean that new pipes will have to be abandoned and replaced with bigger pipes. However, as noted above, where Page 27 greenfield areas

are serviced by smart local pressure sewer systems, some capacity is available for intensification.'[1]

5.4 Ms McDonald's opinion reflects statements made at paragraphs 3.2 & 3.7 of the Three Water Memo of 10 February 2023 (Appendix 3), available in the background s 32 Reports for PC14:

3.2 From a Three Waters perspective, the adoption of an 'intensification zone' will exclude the following areas from intensification:

· Serviced areas on the periphery of the Three Waters service catchments;

· Un-serviced urban fringe areas;

· Residential New Neighbourhood greenfield areas;

· Serviced and un-serviced industrial zones; and

· Hill land where servicing constraints and adverse stormwater effects are higher.

3.7:· *Although some intensification could be feasible in Greenfield residential new neighbourhood areas, for the most part, the Three Waters infrastructure constructed to service these areas have been sized for the zoning as per the operative District Plan. It will not be cost-effective nor economically feasible to upgrade infrastructure that is less then 10 years old;*

5.5 As outlined above, the Three Waters infrastructure has been designed in accordance with the existing zone. I share the concern that it will not be cost effective nor economically feasible to upgrade the infrastructure for the North Halswell ODP Area.

6 CONCLUSION

6.1 The rezoning of land prescribed within PC14 will require significant increases in stormwater retention capacity of facilities located within Spreydon Lodge Ltd land. This corresponds to an increase in the land area required for stormwater management.

6.2 These facilities are either complete or partially complete. All design and construction undertaken to date has been agreed with Council and funded under a cost share agreement which is based on current land zoning. Rezoning of land within the catchments would require a comprehensive re-design of the planned and constructed stormwater infrastructure.

[1] STATEMENT OF PRIMARY EVIDENCE OF MICHELE ANN MCDONALD ON BEHALF OF CHRISTCHURCH CITY COUNCIL, 81. (b)

6.3 It is uncertain whether the downstream land drainage network can support the rezoning of land prescribed in PC14.

6.4 It is likely that upgrading of recently installed sewer infrastructure would be required to accommodate the additional sewage loading presented by the rezoning of land prescribed in PC14. The cost-implications and feasibility of undertaking upgrades are likely to be significant.

Jamie Verstappen

20 September 2023

7 Appendix A – Halswell Commons and Meadowlands Stormwater Catchment Plans

Appendix B – Stormwater Calculations