

**BEFORE THE HEARING COMMISSIONERS APPOINTED
BY THE WAIMAKARIRI DISTRICT COUNCIL**

IN THE MATTER OF The Resource Management Act 1991 (**RMA**)

AND

IN THE MATTER OF Hearing of Submissions and Further
Submissions on the Proposed Waimakariri
District Plan (**PWDP** or **the Proposed Plan**)

AND

IN THE MATTER OF Hearing of Submissions and Further
Submissions on Variations 1 and 2 to the
Proposed Waimakariri District Plan

AND

IN THE MATTER OF Submissions and Further Submissions on the
Proposed Waimakariri District Plan by **Mike
Greer Homes NZ Limited**

**EVIDENCE OF JAMIE VERSTAPPEN
ON BEHALF OF MIKE GREER HOMES NZ LIMITED REGARDING HEARING
STREAM 12E**

Dated: 5 March 2024

Presented for filing by:
Chris Fowler
Saunders & Co
PO Box 18, Christchurch
T 021 311 784
chris.fowler@saunders.co.nz

INTRODUCTION

- 1 My full name is Jamie Michael Verstappen. I am a Director and Civil Engineer at Davie Lovell-Smith Ltd.
- 2 I hold a Bachelor of Civil Engineering from Canterbury University (BE (Civil) Hons). I am a chartered member of Engineering New Zealand (CENZ) and a Chartered Professional Engineer (CPEng).
- 3 I have 12 years' experience in the civil engineering field and 9 years' experience in land development in Canterbury.
- 4 I have read the Environment Court's Code of Conduct and agree to comply with it. My qualifications as an expert are set out above. The matters addressed in my evidence are within my area of expertise, however where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

SCOPE OF EVIDENCE

- 5 In my evidence I address the earthworks and infrastructure servicing requirements for the proposed residential development of approximately 14.2 hectares of land located at 144 & 168 Main North Road, Kaiapoi (**the Site**).

SUMMARY

- 6 My evidence demonstrates that:
 - (a) Stormwater treatment for the Site can be provided and managed on site to meet the residential water quality discharge requirements of the Waimakariri District Council.
 - (b) Stormwater attenuation can be provided within the site to service the proposed residential development.
 - (c) Wastewater servicing for the Site can be provided by new Council vested infrastructure constructed by the developer..
 - (d) The Kaiapoi wastewater treatment plant has adequate capacity available to service residential development of the Site.

- (e) The Kaiapoi potable water network has adequate capacity available to service residential development of the Site.
- (f) The electrical and telecommunication network can be extended to service the residential development of the Site.

SITE DESCRIPTION

- 7 This land lies between the Main North Road (west), the railway line (east), Kaikainui Stream (north) and Courtney Stream (south). It adjoins the current southern urban boundary of Kaiapoi. It has a land area of approximately 14.2ha.
- 8 The legal description of the Site is: PT RS 37428 (CB701/7) limited to the area west of the Main Trunk Railway line, RS 39673 & Lot 1 DP 19366.
- 9 The land is primarily in pasture at present, with some cropping, a single dwelling in the southwestern corner, and some minor farm buildings and stock yards.

THE PROPOSAL

- 10 The Site is zoned Rural in the Operative Waimakariri District Plan and Rural Lifestyle in the Proposed Waimakariri District Plan (**PDP**). A submission has been lodged on both the PDP and Variation 1 to the PDP, seeking that the Site be zoned Medium Density Residential Zone (**MDRZ**). This evidence is in support of these submissions.
- 11 A Draft Subdivision Scheme Plan included at **Appendix A** provides a general concept of how the Site is would be developed assuming the zoning for the Site is MDRZ. For the purpose of my evidence it is assumed the Site will be subdivided into 186 new residential lots along with associated roads and reserves as shown on the plan.

EARTHWORKS

- 12 The Site is subject to various levels of flood risk as shown on the Waimakariri District Council (**Council**) flood mapping. Generally, there is low to medium risk across areas suitable for new lots and high risk along waterways at the northern and southern boundaries and the low lying eastern portion of the

site, as shown in the image taken from the Council Natural Hazards on-line tool at **Appendix B**.

- 13 Filling of up to 1m depth across the Site will be required to ensure building platform levels for new lots are above the 200 year flood level which will allow minimum floor levels required by the PDP to be easily achieved.
- 14 Preliminary calculations indicate approximately 50,000m³ of fill material will be required to achieve this flood clearance. The calculations have been undertaken using a preliminary earthworks model on the Draft Subdivision Scheme Plan layout. Conceptual earthworks drawings are attached as **Appendix C**.
- 15 Any filling within the flood plain area will cause a reduction in available flood storage. To offset this loss of storage, a portion of the fill material used within the Site would be obtained from site excavations within high hazard flood areas where stormwater facilities will be located.
- 16 It is anticipated that through further detailed engineering design of the Site, coupled with further flood modelling investigation, any effects of flooding to neighbouring land as a result of the development can be mitigated to an acceptable level. If necessary, amended conceptual earthworks drawings will be prepared and shared with Council (and filed as supplementary evidence in due course).
- 17 The geotechnical investigation undertaken for the Site indicates that the soils beneath the Site are suitable for use as fill material and following earthworks across the site the likely classification would be TC2.
- 18 New building platforms will be sufficiently set back from waterways and stormwater basins to ensure lateral spreading hazard is effectively mitigated. Ground improvement along these waterways and basins may also be implemented.
- 19 All earthworks will be completed as per the requirements of the ECAN and WDC earthworks standards and will be monitored by a suitably qualified geotechnical consultant

INFRASTRUCTURE ASSESSMENT

Stormwater

- 20 Stormwater treatment and attenuation requirements for the Site will be determined through the ECAN resource consenting process. Stormwater treatment and flow attenuation will be required and can be provided on Site within the allocated drainage reserve.
- 21 Preliminary stormwater calculations for the Site indicate up to 4,498m³ of on-site retention would be required to attenuate flow back to pre-development levels. These calculations are based on a 24 hour 50 year ARI rainfall event which is considered a conservative estimate for the development and in line with the WDC Engineering Code of Practice guidance. The calculations are attached as **Appendix D**.
- 22 This drainage reserve will be located within the naturally lower lying eastern area of the Site which is already shown to be flood prone. The construction of this reserve will help to mitigate any upstream flooding effects as a result of the development works and in fact provide more efficient conveyance of flood flow through the site in large flooding events.
- 23 The point of discharge for the Site could either be to the north into Kaikainui Stream, south into the Courtenay Stream, or a combination of both to minimise any impact on the receiving waterbodies and to best simulate the pre-development discharge conditions.

Wastewater

- 24 The Site is located within the proposed South Kaiapoi Growth Area identified in a WDC internal Memorandum regarding the South South Kaiapoi Water and Wastewater Structure Plan dated July 2021¹ (**Investigation Memo**) attached at **Appendix E**. The purpose of this Memo was to develop a better understanding of the infrastructure needs for any future development of South South Kaiapoi.

¹ Waimakariri District Council Memo SEW-03-01-02/210723120569 dated July 2021

- 25 The Investigation Memo includes Figure 1 which identifies the growth areas assumed for the Structure Plan². Figure 1 is reproduced below.

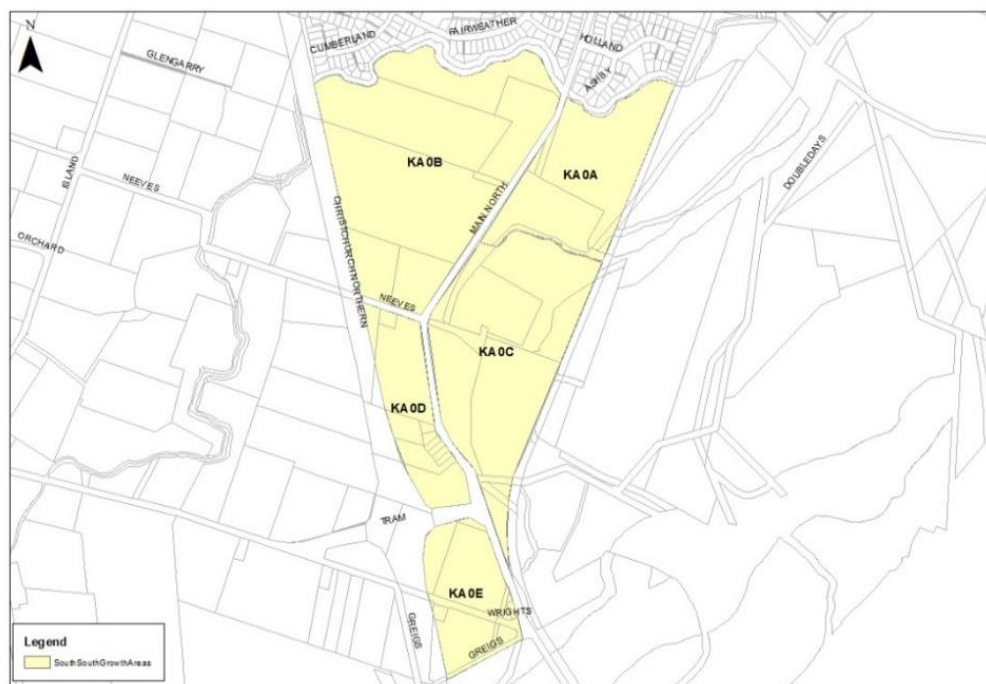


Figure 1: Growth areas assumed for South South Kaiapoi structure plan

- 26 The Site is within Growth Area KA 0A on Figure 1.
- 27 It is noted that the investigation was based on the Site being developed into 159 new lots, however due to the proposed MDRZ the total number of new lots is likely to be closer to 186. This would increase the peak wastewater flow from 9.7 l/s previously modelled to 11.3 l/s. This is only a modest increase, and the findings of the Investigation Report are still considered relevant.
- 28 Council investigated three options for wastewater servicing. These options involved the use of gravity sewer networks discharging to a pump station, or series of pump stations, which convey wastewater either to the existing Kaiapoi wastewater network or directly to the Kaiapoi Wastewater Treatment Plant (**WWTP**). The pump station/s would be constructed as required by the development of land and funded by Council directly or through a developer agreement.
- 29 The investigation concluded that Council's preferred method was for the South South Kaiapoi growth area to discharge to the existing Parkham Street Pump Station, then through a new dual rising main to the WWTP. This option

² Supra at page 2

would be completely developer funded but would provide additional resilience in the pressure main network for surrounding areas. A plan detailing this option is attached as **Appendix F**

- 30 Costings for this option were estimated within the Investigation Report and draft development contribution values calculated. For the Site these were \$6,000/lot. Although the values may need to be updated to align with the current market, I agree with the findings of the Investigation Report.
- 31 Given the ground conditions at the Site, a local pressure sewer (**LPS**) network may be considered more suitable than the combination of gravity network and pump stations outlined above. These LPS systems have the benefit of greatly reducing flow peaks and overall wastewater volumes which would reduce the impact of this development on the downstream network, potentially requiring less extensive upgrades.
- 32 Following discussions with Council officer Chris Bacon, it is understood that there are currently no concerns with the capacity of the (**WWTP**) to accommodate growth within the Kaiapoi catchment. Should upgrades be required as a result of new development, these could be undertaken and funded through the development contribution scheme. This position is also confirmed in the Activity Management Plan 2021 for the Kaiapoi Wastewater Scheme.
- 33 I agree with the findings of the South South Kaiapoi Water and Wastewater Structure Plan, however note that further analysis will be required to ensure the most appropriate outcome is achieved. This analysis would be undertaken during future resource consent processes for the Site.

Water Supply

- 34 Referring again to the South South Kaiapoi Water and Wastewater Structure Plan, a comprehensive water network model was undertaken for the South South Kaiapoi Growth Area.
- 35 The draft water network produced shows the Site being serviced by a 200mm watermain installed along Main North Road and an internal network of 150mm watermains within the Site. This proposed water supply scheme plan is attached as **Appendix G**

- 36 The investigation concludes that the Growth Area can be most efficiently serviced by two points of connection into the existing Kaiapoi water network, at Robert Coup Road and Holland Drive, which are near to the Site.
- 37 To service the entire Growth Area and to avoid additional reservoir storage requirements, headworks upgrades to provide an additional 70 l/s would be required. It is understood these upgrades are underway.
- 38 It was confirmed that firefighting requirements were still able to be achieved within the nearby Kaiapoi network, with the additional demand generated by this growth area included.
- 39 Cost estimates for the new watermain network within the growth area were undertaken within the investigation and draft DC figures provided. For the Site these were \$1,400/lot. The complete cost of this network upgrade was to be provided by development contributions, with no funding required by WDC.
- 40 I agree with the findings of the South South Kaiapoi Water and Wastewater Structure Plan, noting that the requirements for servicing of the Site for water supply would need to be confirmed during future resource consent processes.

Power and Telecommunications

- 41 Mainpower has confirmed the proposed development can be serviced for power from their local power network. A letter confirming this is attached as **Appendix H**.
- 42 Chorus NZ Ltd has confirmed that the proposed development can be serviced for telecommunications from their network in the general; area of the Site. A letter confirming this is attached as **Appendix I**.

CONCLUSION

- 43 The Site is located within a South South Kaiapoi Growth Area for which Council have previously investigated the servicing requirements for wastewater and water supply.
- 44 The Site is susceptible to various levels of flood risk, requiring filling of parts of the Site to ensure build platforms are elevated above flood levels. Offsetting of flood storage can be provided on Site through the construction of new stormwater basins.

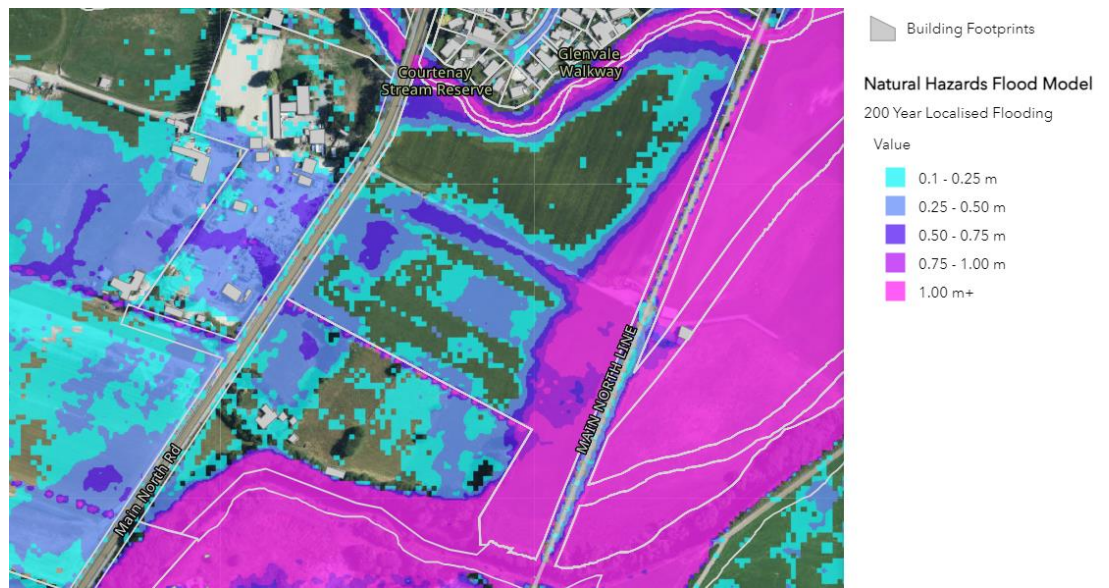
- 45 The construction of formal flow paths through development of the Site would provide a more efficient means of conveyance for flood flow, reducing the flood hazard for areas adjacent to the Site.
- 46 Stormwater management will include treatment and flow attenuation, utilizing existing flood prone areas for stormwater management facilities.
- 47 Council's preferred wastewater servicing plan for the Site involves a gravity sewer network discharging to the existing sewer network requiring upgrades to the current pressure network. Costings and the associated development contributions for this wastewater solution have been estimated.
- 48 If the WWTP does not have capacity to accommodate this proposal, upgrades can be undertaken through development contribution funding.
- 49 The Site and further growth areas south of Kaiapoi can be serviced by two points of connection to the existing network and a headworks upgrade to provide an additional 70 l/s. This headworks upgrade is underway.

Jamie Verstappen

5 March 2024

Appendix A – Draft Subdivision Scheme Plan

Appendix B – South Kaiapoi Flood Mapping



Appendix C – Conceptual Earthworks Drawings

Appendix D – Stormwater Attenuation Calculations

Appendix E – WDC Memo dated July 2021 regarding the South South Kaiapoi Water and Wastewater Structure Plan:

Appendix F – South South Kaiapoi Growth Area, Sewer Network Option 2

Appendix G – South South Kaiapoi Growth Area, Water Scheme Plan

Appendix H – Mainpower Capacity Confirmation Letter

Appendix I – Chorus Capacity Confirmation Letter