Before an Independent Hearings Panel
Appointed by Waimakariri District Council

under: the Resource Management Act 1991

in the matter of: Submissions and further submissions on the Proposed Waimakariri District Plan

and: Hearing Stream 12D: Ōhoka rezoning request

and: **Carter Group Property Limited**
(Submitter 237)

and: **Rolleston Industrial Developments Limited**
(Submitter 160)

Supplementary statement of evidence of Chris Sexton (Spatial analysis)

Dated: 18 June 2024

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SUPPLEMENTARY STATEMENT OF EVIDENCE OF CHRIS SEXTON

INTRODUCTION

1 My full name is Christopher Philip Sexton.

2 My area of expertise, experience, and qualifications are set out in my statement of evidence dated 5 March 2024 for this hearing stream.

3 The purpose of this supplementary evidence is to respond to matters raised in the Officer's Report dated 31 May 2024 relevant to my evidence.

CODE OF CONDUCT

4 Although this is not an Environment Court hearing, I note that in preparing my evidence I have reviewed the Code of Conduct for Expert Witnesses contained in Part 9 of the Environment Court Practice Note 2023. I have complied with it in preparing my evidence. I confirm that the issues addressed in this statement of evidence are within my area of expertise, except where relying on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

SUMMARY OF RESPONSE TO OFFICER'S REPORT

5 Mr Willis in his Section 42A report states that the matters raised in my evidence in chief do not make a material difference to the modelled capacity[1]. Mr Willis also states that the Waimakariri Capacity for Growth Model 2022 (*WCGM22*) has been shown to be conservative compared to what developers have achieved over the last two years since the model was developed. My supplementary evidence responds to these points and provides evidence that WCGM22 is overestimating capacity relative to that being realised by developers.

6 In addressing the points raised by Mr Willis, I refer to the Evidence of Mr Yeoman and memo provided by Mr Wilson that informed the Section 42A report.

7 My findings from analysis of the Land Uptake Monitoring Survey (*LUMS*) show that there are fundamental issues in the way capacity is calculated due to the assumptions adopted, resulting in significant overestimation of capacity predicted. As Mr Wilson admits in his memo, the LUMS does not consider if the capacity is feasible[2], and merely calculates capacity based off a number of assumptions regarding net area available and housing density. On this basis I

[1] Section 42A report, paragraph 149.

[2] Memo on housing uptake and Land Uptake Monitoring Survey, paragraph 16.

believe that it should not be relied upon for any capacity assessments, especially when trying to determine compliance with sufficiency requirements of the NPS-UD. I provide a detailed analysis of this later in my evidence.

8 My findings from reviewing the LUMS is that while developers are achieving a higher net density than the LUMS calculates, both the LUMS and WCGM22 both significantly underestimate the amount of land required for roading infrastructure, stormwater management, reserves and commercial areas within developments. This results in the total amount of vacant capacity (total yield) within the greenfield developments being lower than that predicted by both LUMS and WCGM22.

9 My review of WCGM22 discredits the claims made by Mr Yeoman and Mr Willis that developers are achieving higher yields than predicted by WCGM22[3] in greenfield areas other than in the case of retirement villages, where in both example cases I was able to find, the underestimations by WCGM22 are insignificant. Mr Yeoman refers to four small townhouse developments that were able to achieve greater yields than WCGM22 predicts, however the difference provided by these small infill developments (13 lots more than WCGM22 calculates), and others like it identified in Mr Wilson's dataset, does not provide any material increase that would make up for the overestimations found elsewhere (>900 lots).

RESPONSE TO HOUSING AND LAND UPTAKE MONITORING SURVEY

10 I have reviewed Mr Wilson's memo discussing how the LUMS tracks developments within the Waimakariri District in terms of potential capacity. Mr Wilson also provided a spreadsheet to submitters that provided the base information for his reporting, including quarterly LUMS updates from 2016 through to September 2022, with a further update for April 2024 that informs his memo attached to Mr Willis's Section 42A report.

11 Gross density and net density are two key metrics used while reviewing both the LUMS and WCGM22. Gross density refers to the total number of residential units divided by the total land area of the development site, including all land required for roads, reserves, stormwater management and other non-residential purposes. Net density focuses exclusively on the land allocated for residential allotments, excluding areas set aside for infrastructure and amenities. Net density is calculated by dividing the number of residential units by the net area of residential lots. The NPS-UD, LUMS and WCGM22 refer to net density. A number of assumptions are made in both WCGM22 and LUMS in terms of calculating the net area from the gross development area.

[3] Evidence of Mr Yeoman, paragraph 3.54 and Section 42A report, paragraph 149.

12 As Mr Wilson discusses in his memo, the LUMS relies on a net density calculation of 12 households per hectare (*hh/ha*) or 15hh/ha for each greenfield subdivision/development area and generally assumes 20% of land is set aside for non-residential areas to service the development, if not otherwise provided. This is an average across the whole greenfield area. The LUMS however, fails to recognise the actual residential lot yield as it is developed. If a developer faces constraints as development progresses such as a reduced net area (e.g., >20% required for roads, reserve and other areas not used for residential allotments) then the LUMS model will not accurately reflect the actual development capacity that is remaining.

13 Mr Wilson states in his memo that the LUMS makes no consideration if a development is feasible[4] and is used solely as a monitoring tool by Council. The LUMS is only appropriate for monitoring the density achieved by developers and should not be relied upon for projected yield in terms of the NPS-UD. This is key when considering the yield calculated by LUMS as the NPS-UD states that capacity must be feasible and realistically expected to be realised. In my opinion this calls into question the use of the LUMS data for monitoring compliance with the NPS-UD sufficiency requirements as Mr Wilson has stated within his memo.

14 I have reviewed each greenfield development/zone identified by Mr Wilson on a line-by-line basis and have compared his results to that which has been achieved by developers. Below I provide four non-exhaustive examples of how the LUMS is inappropriate for inferring the development capacity available in greenfield developments and how it should not be relied upon. These examples show how LUMS will overestimate potential capacity within a development.

14.1 Example 1 is the Bellgrove residential subdivision in Rangiora[5] which is expected to yield 726 residential allotments[6] over the entire site based upon current consented allotments and the development masterplan. Mr Wilson noted that the Bellgrove subdivision in Rangiora was not included in LUMS, however it has now been manually added[7].

14.2 Mr Wilson states in his memo that the LUMS anticipates 800 allotments at 12hh/ha or 1000 allotments at 15 hh/ha. Upon closer review of the data, Mr Wilson has incorrectly applied a gross site area of 800,000 m² or 80 ha, the actual

[4] Memo on housing uptake and Land Uptake Monitoring Survey, paragraph 16.

[5] Refer to Appendix 1 for location plan.

[6] This number differs from the 800 lot assumption used in my PC31 evidence based upon more recent evidence from the developer on the anticipated yield.

[7] Memo on housing uptake and Land Uptake Monitoring Survey, paragraph 7.

development area of the development known as Bellgrove is only 62.9ha.

14.3 The first 20.847 ha of the Bellgrove development has yielded a total of 198 residential allotments, achieving a net density of 21.27 hh/ha. While this result is greater than the 15 hh/ha target as stated by Mr Wilson, the significant area of land required for roads, stormwater reserves, commercial areas and recreation reserves comes to 11.5ha or 55% of the gross site area. While it can be said that the developer is achieving higher net density than anticipated by LUMS, the area of non-residential land required to service the development is significantly higher (55%) than the baseline of 20% that Mr Wilson has applied. Ultimately, this results in a lower overall yield from the development than the LUMS model would predict.

14.4 Example 2 is the Farmlands Development Trust block[8] that consists of 89 residential allotments over 4.2 ha gross site area. Mr Wilsons' assessment of the LUMS shows that he has only allowed for 20% non-residential land. This development is now completed, and the final area excluded from the net site area was 2.07ha or 33% of the gross area. This results in a net density of 21.17 hh/ha. While this development doesn't indicate any remaining capacity in the LUMS, it should have been used to check the assumptions of 20% non-residential land made by Council when calculating the net site area.

14.5 Example 3 is the East Rangiora South development[9] which covers a gross area of 5.17 ha. A total of 46 allotments have been developed and all allotments have been built upon. LUMS underestimates the area of non-residential development by assuming 20% when in reality the non-residential land takes up 26% of the development area or 1.36 ha. This results in a net density of 12.05 hh/ha for the site. The LUMS also shows a 'phantom capacity' (i.e. capacity that cannot be realised as all dwellings are constructed already, but the model shows capacity as being available) for this development when considering 15 hh/ha of 11.43 allotments. This capacity is unable to be achieved as the houses have already been constructed. This is another example where the assumptions of 20% non-residential land made by Council when calculating the net site area should be cross checked and updated as development progresses and is completed.

[8] Refer to Appendix 1 for location plan.

[9] Refer to Appendix 1 for location plan.

14.6 Example 4 is the Doncaster development[10] covering a total of 25.114 ha and consists of 201 residential allotments, a commercial area, church and stormwater and recreation reserves. The non-residential area is 11.97 ha or 48% of the development area. The LUMS uses a value of 30% for non-residential land. Currently within the development area there are two vacant residential allotments. Both of these residential allotments feature a land covenant[11] that states only a single dwelling with a minimum floor area of 210m² may be erected. The LUMS suggests that there is vacant capacity for 11 more dwellings at 12 hh/ha or 65 at 15 hh/ha. It appears that the LUMS has not been cross checked with what is realistically being realised on site and in doing so provides an inflated estimate of capacity that is unable to be realised.

15 The findings in the four examples above can be summarised in the following table:

	LUMS assumed non-residential land %	Actual non-residential land %	LUMS assumed yield April 2024 (15hh/ha)	Actual yield
Bellgrove	20%	55%	1000	726
Farmlands	20%	33%	75	89
East Rangiora South	20%	26%	57	46
Doncaster	30%	48%	270	201

16 These four examples highlight flaws within the LUMS in terms of the calculation of net site area and management of data by Council in terms of identifying completed developments. Mr Wilson states that if non-residential areas that don't contribute to the net residential area are known then this is input into LUMS, otherwise a baseline of 20% is used[12]. It appears from the information provided that this is only assessed at initial subdivision consent application stage and is not updated as the development progresses. Of the 18 developments identified within LUMS, 12 of these developments have all adopted a 20% allowance for non-residential land required.

[10] Refer to Appendix 1 for location plan.

[11] Easement Instrument - 9196005.12, clause 3(a).

[12] Memo on housing uptake and Land Uptake Monitoring Survey, paragraph 4.

Of the developments where a revised non-residential land requirement has been input as a result of what has occurred on the ground, this is always >20% for non-residential land. However, of the developments where a value other than 20% has been used there have been found to be errors where the actual percentage of land required is greater than that stated within LUMS, e.g. the Doncaster development as identified above. My review shows a failure to accurately maintain the LUMS data and update all assumptions each quarter.

17 While developers have been achieving greater net densities than has previously been anticipated, the percentage of land required to service these developments is well in excess of the 20% baseline adopted by Mr Wilson for the LUMS. As greenfield developments continue to push into more marginal land where there are greater constraints such as high groundwater and flood hazard, the land area required for stormwater management may continue to increase. This is likely to result in lower overall yields than the 'densities to date' due to significant and higher than anticipated portions of land being unavailable for residential allotments, notwithstanding higher net densities in the areas that are being developed. This situation is illustrated in the table below, showing the relationship between development density and the net developable area, in terms of overall yield which could range between 720-1,600 dwellings depending on the density and net developable area.

Capacity realised from on a nominal gross area of 100 hectares, accounting for different densities and net development areas				
	20% non-residential (i.e. 80ha net area)	30% non-residential (i.e. 70ha net area)	35% non-residential (i.e. 65ha net area)	40% non-residential (i.e. 60ha net area)
12hh/ha	960	840	780	720
15hh/ha	1200	1050	975	900
20hh/ha	1600	1400	1300	1200

RESPONSE TO ECONOMIC EVIDENCE FROM MR YEOMAN

18 I note that Mr Yeoman has referred to the decision on PC31 where the independent commissioners concluded that WCGM22 was likely to have overstated capacity within the Waimakariri District[13]. The

[13] Evidence of Mr Yeoman, paragraph 2.1(b).

commissioners' recommendation for PC31 stated the following (in full):

> *We conclude on the evidence of Mr Sexton, Mr Walsh and Mr Akehurst that there is a very real likelihood that the model has overstated residential capacity. It was also Mr Yeoman's opinion, that the WCGM22 modelling results illustrated that the margin (without accounting for the additional matters identified by Mr Sexton in Figure 1), is small. The degree to which Mr Yeoman's modelling is reliant on additional capacity as a consequence of the Housing Intensification Planning Instrument being advanced as part of the District Plan review is not clear, and will no doubt be subject to scrutiny in the review of the District Plan currently underway.*[14]

19 Mr Yeoman states in his evidence that since the model was developed in 2022 that the *"… WCGM22 has been shown to be conservative as compared to what developers have achieved over the last two years since it was developed…"*[15]. Mr Yeoman states that he has reviewed recent growth trends, projected growth, developer intentions and building consent data to verify his claims.

20 Mr Yeoman provides four examples of where the WCGM22 underestimates yield within his PC31 evidence[16]. The developments he identifies provide a total of 15 allotments where WCGM22 only predicted 2. All of these developments are small infill developments. The additional capacity provided by these infill developments in the short to medium term, and others like it included in Mr Wilson's data for multi-unit developments and MDRS developments from which Mr Yeoman drew his four examples, is insignificant in terms of the overall district requirements.

21 Mr Yeoman states that recent developments post PC31 have also yielded higher densities than the WCGM22 assumed[17]. Mr Yeoman has not provided any examples of where this has occurred post PC31 for any greenfield developments. I have reviewed a number of consented developments that have taken place since PC31 to compare the realised yield against what was anticipated by the WCGM22. Three examples are provided as follows:

21.1 Example 1 is the Bellgrove residential subdivision, which is the largest greenfield development currently underway in Rangiora. WCGM22 calculated that the development would yield a total of 952 allotments[18] within the short to medium term. The first 20.85ha of the 62.89ha development has been

[14] PC31 Commissioners Decision Report, paragraph 81.

[15] Evidence of Mr Yeoman, paragraph 3.54.

[16] Evidence of Mr Yeoman for PC31, paragraph 181.

[17] Evidence of Mr Yeoman, paragraph 2.6.

[18] This differs from the 800 lots shown in Appendix C of my Evidence in Chief due to the developers masterplan now being available.

consented and constructed. Upon review of the developed first stages of the development a total yield of 198 residential allotments has been achieved. I also reviewed the latest masterplan with anticipated number of allotments per stage for the future stages. The masterplan shows a yield of 528 lots over the remaining stages for a total of 726 residential allotments over the entire development. This total is significantly less than the 952 allotments calculated by WCGM22. If applying the WCGM22 yield over a pro-rata of the area developed to date, then the WCGM22 would calculate that the first 20.85 ha would yield 316 lots (c.f. 198 actual).

21.2 Example 2 is the Ravenswood development in Woodend which features a prominent commercial area along with a lifestyle village, recreation reserves and stormwater management areas. I was able to determine the total actual yield for the development by reviewing the subdivision masterplan and current titled allotments within the development. A ground-truth exercise was carried out to determine the number of dwellings constructed and hence capacity removed to-date. The table below outlines the differences between the WCGM22 and actual yield, and finally addresses any uptake in capacity since the WCGM22 model was produced.

Parcel ID	WCGM22 Capacity	Actual Yield	Difference	# of dwellings constructed[19]	Revised Capacity[19]
8385567	399	383	-16	195	188
8282619	349	290	-59	0	290
3482708	16	15	-1	0	15
7878953	179	0	-179	0	0
8325847	131	237	106	78	159
8087500	9	0	-9	0	0
8087501	26	0	-26	0	0
7878952	9	0	-9	0	0
8087499	5	0	-5	0	0
Vacant Lots	227	225	-2	206	19
Total	**1350**	**1150**	**-200**	**479**	**671**

21.3 When comparing the revised capacity to the WCGM22 there is a difference of 679 allotments[20]. In other words, less than 50% of the initial capacity for the Ravenswood development calculated in the WCGM22 is currently available as capacity.

[19] As at January 2024.

[20] 1350 (WCGM22) – 671 (revised capacity) = 679.

21.4 A single parcel within the Ravenswood development was able to yield a higher capacity than the WCGM22 calculated. This parcel is the underlying parcel for the Freedom Lifestyle Village (a retirement village). The underestimation on this single parcel (WCGM = 131, actual yield = 237) within WCGM22 is small compared to the overestimation on every other remaining parcel within the development, let alone the additional shortfall once constructed dwellings are taken into consideration further removing capacity. Since WCGM22 was produced some parcels within the Ravenswood development have also been rezoned to commercial/town centre zoning, removing the ability for these parcels to provide residential capacity (actual yield = 0).

21.5 Example 3 is a comprehensive development being carried out by Mike Greer Homes within Pegasus which has been completed since the WCGM22 was developed, yielding a total of 78 allotments[21]. The WCGM22 anticipated a total of 85 allotments over the site, showing that WCGM22 can overestimate the capacity available within comprehensive developments. Again, as with Ravenswood, a number of these sites have since been completed, further removing available capacity.

22 The only other development I was able to find achieving a higher yield than the WCGM22 is the Summerset Retirement Village in Rangiora. WCGM22 calculates that there will be a yield of 211 allotments from the Summerset site. Upon review of the resource consent application, the Summerset village will contain a total of 260 self-contained villas and cottages. This results in only a small difference in yield between WCGM22 and reality with an underestimation of 49 allotments in WCGM22.

23 From my review of all current greenfield developments I was only able to find two examples where developers were achieving higher yields than the WCGM22 predicted, in both cases they were retirement/lifestyle villages. The underestimations on these two sites are insignificant (being 155 lots in total) in comparison to the overestimations that occur on the other sites investigated (net 377 yield difference and with uptake taking this to >900 allotments of overestimated current capacity if assessed today). This further validates my findings that the WCGM22 significantly overestimates capacity on greenfield developments, but slightly underestimates for retirement villages. Overall the WCGM22 overestimates the current available housing capacity. While there may be other parcels that have yielded greater returns than WCGM22 anticipated, I believe these would be small developments, most likely infill developments. I have not reviewed the uptake over the entire district, but I have

[21] Actual subdivision has been completed so yield has been updated post PC31 assumptions.

no doubt this would further erode the capacity available as stated within WCGM22.

24 Mr Yeoman stated in his PC31 evidence[22] (which he refers to extensively and attaches to his evidence for this process) that the WCGM22 assumes a 25% allowance for non-residential land such as roads, stormwater basins and reserves. From my review of recently completed developments in the Waimakariri District an allowance of 25% is lower than what is being achieved in practice, as is the 20% adopted by Mr Wilson in the LUMS. As more marginal land is developed the requirement for additional land for stormwater management will increase due to factors such as high groundwater levels, flood hazard etc. This underestimation on the land area required to service residential allotments means that the WCGM22 will continue to overestimate the yields that are able to be achieved from greenfield developments.

25 Mr Yeoman relies upon the LUMS for his argument that developers are achieving a greater density than anticipated in the WCGM22 for greenfield land. But as previously discussed, the increase in net density still does not make up for the significant amount of land unable to be developed and hence, the gross density and overall yield is still lower than that stated within the WCGM22.

26 Mr Yeoman noted that my review of the WCGM22 does not consider parcels of land being evaluated under the current district plan review[23]. To clarify, my review focused solely on the WCGM22 and what developers were able to achieve in comparison to what the model predicted. I did not conduct an independent feasibility analysis to determine the viability of developing parcels not included in the WCGM22 model.

CONCLUSION

27 In conclusion the findings of my scrutiny of both the LUMS and WCGM22 have found that both significantly overestimate the currently available residential capacity in the Waimakariri District when focussing on greenfield development (which accounts for the majority of reported feasible capacity in the three main townships).

28 I am of the opinion that LUMS has a number of limitations and should not be relied upon for any capacity assessments. The LUMS calculates an estimated lot yield with incorrect assumptions and does not take into consideration the actual subdivision yield in terms of number of residential allotments created.

29 Mr Willis and Mr Yeoman have not provided any evidence that developers are achieving yields materially greater than the WCGM22 anticipates other than for retirement villages and infill development.

[22] Evidence of Mr Yeoman for PC31, paragraph 111.

[23] Evidence of Mr Yeoman, paragraph 3.56.

The examples provided by Mr Yeoman of infill development providing more capacity than WCGM predicts is immaterial in terms of the gross overestimation on the greenfield developments.

30 Both the LUMS and WCGM22 underestimate the amount of non-residential land required for stormwater management, recreation reserves, roads and commercial areas based upon my review of existing developments within the Waimakariri District. As a result of this both models overestimate residential development capacity in greenfield areas.

31 The WCGM22 proceeds to overestimate the development capacity of greenfield developments when comparing to what developers are achieving.

32 WCGM22 does not consider uptake of capacity since the model was built 2 years ago, providing a false impression that capacity is still available if sufficiency was re-calculated today.

Dated: 18 June 2024

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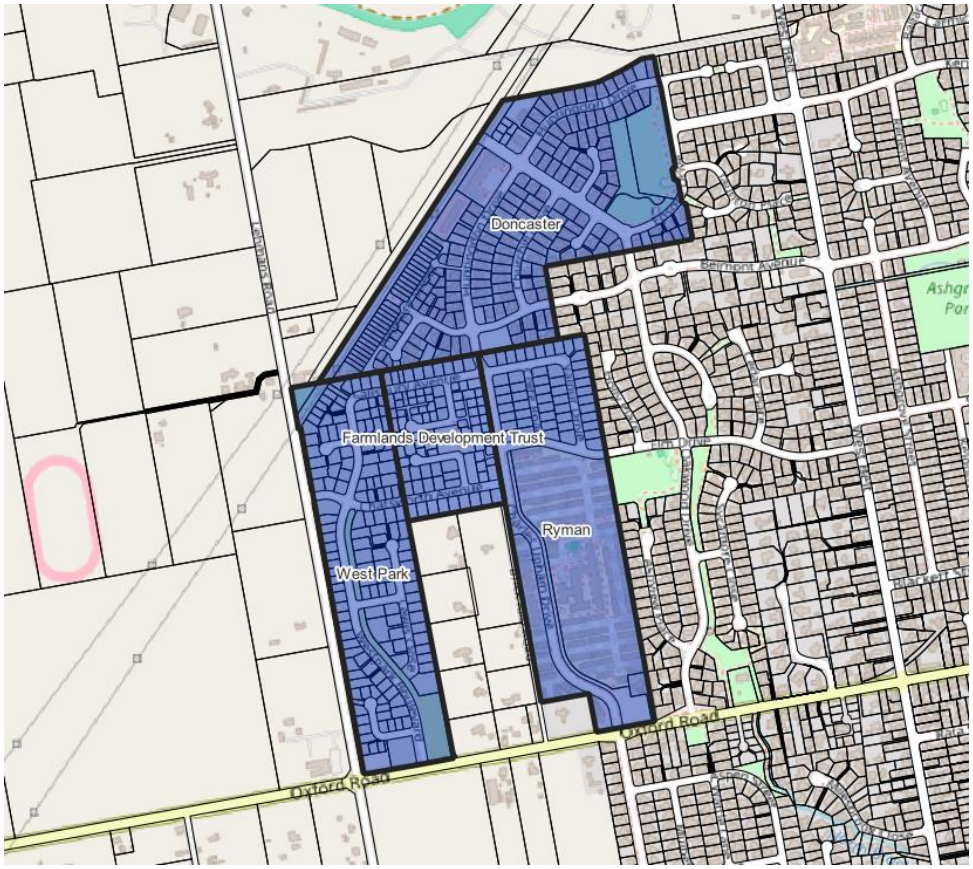
Chris Sexton

APPENDIX 1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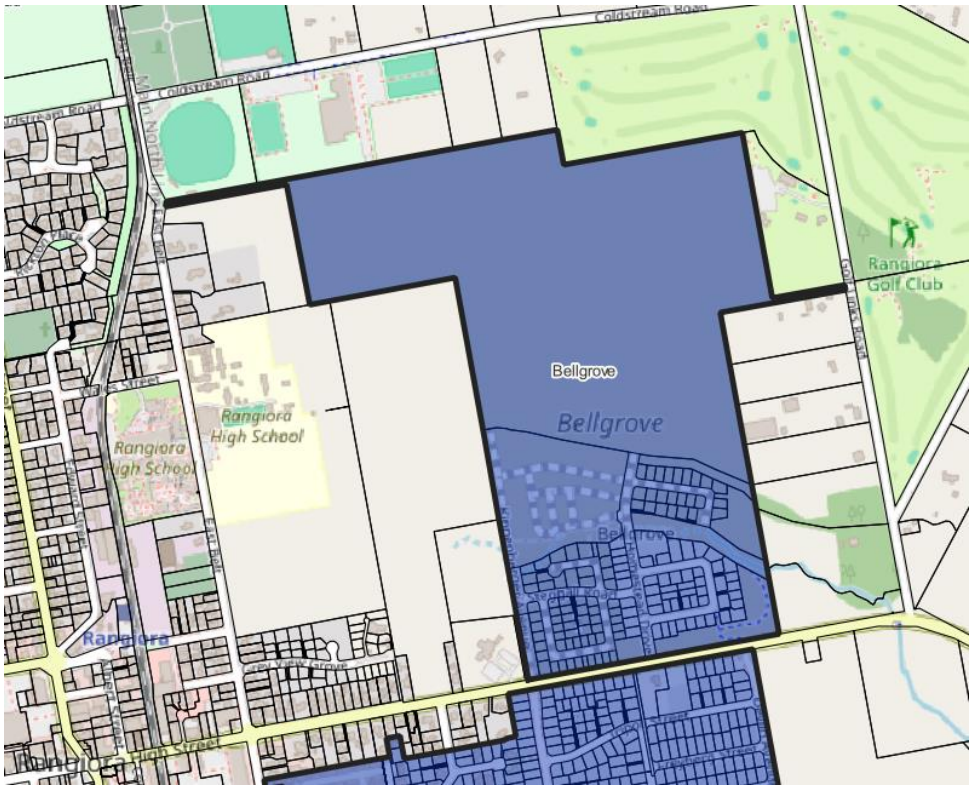
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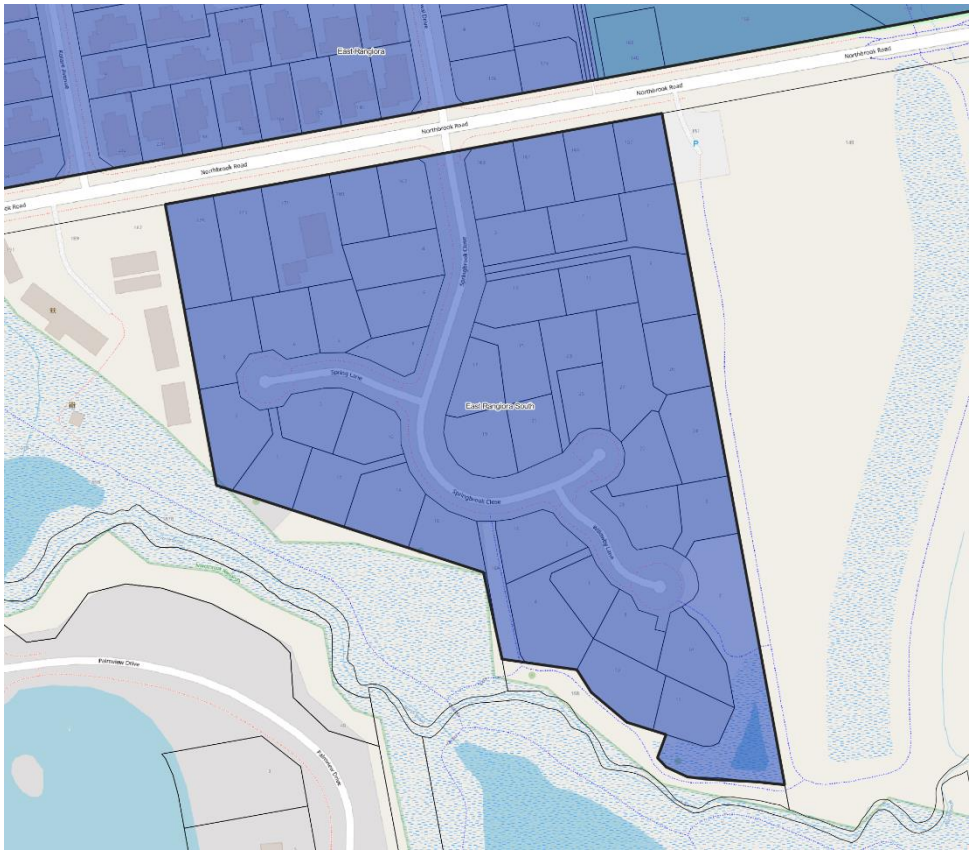
Bellgrove
Bellgrove
Rangiora High School
Rangiora High School
Rangiora
High Street


East Rangiora
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Northbrook Road
Northbrook Road
Springbrook Close
Spring Lane
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Spring Lane
Palmview Drive
Palmview Drive