Before the Selwyn District Council

under: the Resource Management Act 1991

in the matter of: Proposed Private Plan Change 69 to the Operative District Plan: Lincoln South

and: **Rolleston Industrial Developments Limited**
Applicant

Statement of Evidence of Mark Taylor (Ecology)

Dated: 4 November 2021

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STATEMENT OF EVIDENCE OF MARK TAYLOR

INTRODUCTION

1 My full name is Mark James Taylor.

2 I hold a degree of Bachelor of Science in Zoology, and have 36 years' experience in environmental assessment, with 17 years (1984-2001) with MAF Fisheries Research Division & NIWA, where I worked as a senior technical officer. In 2001 I founded Aquatic Ecology Limited, a consultancy group, and still working there.

3 I have been the senior author, and co-authored a number of scientific papers on freshwater fish ecology while with NIWA.

4 I have been a member of the Limnological Society of New Zealand, now the New Zealand Freshwater Sciences Society, since 2001.

5 Commissioned by mostly local development companies, I have undertaken preliminary investigative and green-field investigations for Plan Changes for nearby developments in Lincoln, including Verdeco directly to the north, and Plan Change, AEE, and water quality monitoring for the Liffey Springs development. I was also involved in the AEE for construction effects on the LII River for the recent (Ararira Springs) school build (with Southbase), and commissioned by Environment Canterbury to evaluate trout spawning grounds in the Te Waihora/Lake Ellesmere catchment, including the LI & LII catchments. Mark has been engaged by Selwyn District Council (SDC) for various ecological compliance studies in the district from time to time, including for recent bankworks on the L2 Creek near Moirs Lane.

6 Further afield, I have prepared numerous reports and memos on ecological values throughout New Zealand, for both private companies and regional councils. For Environmental Canterbury, I have sat on technical panel for setting minimum flows for the Mid-Canterbury Region, and supplied ecological information for the Regional Plans.

7 I sat on the board of management for the Living Laboratory Board of Management (Styx River environmental enhancement) for 10 years, and received a civic award for contribution to that cause.

8 In respect to residential developments, I have been involved in greenfield surveys, Assessment of Effects, and naturalisations in waterways and wetlands in many of the major residential subdivisions in Christchurch (Prestons, Champions Mile, Aidanfield, Highsted, Spring Grove, Burlington, Yaldhurst Estate, Milns Park, and others).

9 For central and local government, I have undertaken many ecological surveys for the Christchurch City Council, Waimakariri District Council, Hurunui District Council, Department of Conservation, Environment Canterbury, and New Zealand Transit Authority.

10 I prepared the Ecological Assessment that was submitted as part of the Plan Change 69 application, identified the information gaps in respect to the location of the wetlands, and organised a supplementary survey to identify these habitats.

11 I have read the s42A report by Nick Boyes and Appendix E of S42A – Ecological Review by Instream Consulting Ltd, and the bulk of my evidence is based on addressing issues raised by him.

12 I am familiar with the plan change application by Rolleston Industrial Developments Limited (*the Applicant*) to rezone approximately 190 hectares of land on Springs Road, Lincoln to enable approximately 2000 residential sites and a small commercial zone.

CODE OF CONDUCT

13 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 7 of the Environment Court Practice Note 2014. 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.

SCOPE OF EVIDENCE

14 My evidence will deal with the following:

- Response to the Sec. 42A report and peer review by Instream Consulting Ltd.
- the ground-verified distribution of springs in the Plan Change Area

SUMMARY OF EVIDENCE

15 Ground-truthing of the spring field in the Plan Change area, identifies two major spring fields, one to the north, centrally located within the Eastern Block of the Plan Change area, and one to the south-east of the Eastern Block of the Plan Change area. Suggested changes are made to the proposed outline development plan, to preserve the recharge of the northern spring field, and some specific setback distances are provided for the spring heads (c. 30 m), Springs Creek (c. 20 m), and minor waterways (c. 10 m).

RESPONSE TO SECTION 42A REPORT AND PEER REVIEW BY INSTREAM CONSULTING LIMITED

16 In response to paragraph 91 of the Section 42A report, I note that consultants are engaged to provide their objective expert opinion. In this instance, when preparing the initial report to accompany the application, we were restricted to a desktop analysis for Plan Change purposes, on the basis that further survey work could follow. This was appropriate at that point in time. From the outset, it was clear from our desktop study, that there were waterbodies in the proposed development area which required further investigation, for the reason outlined by Mr Boyes, in that they are sensitive to catchment change. Our initial report was entirely desktop based and as such recommended a field survey which was undertaken. The conservative statement quoted by Mr Boyes was from our desktop report without the later fieldwork (in January 2021), and reflects the unknown nature of the wetlands identified from our aerial imagery at the time.

17 With regards to paragraph 93, my Report was not intended to suggest, *carte blanch,* that the bare minimum of a 10 m setback for all waterbodies, springs, and wetlands within the plan change site will provide full protection. The 10 m setback rule can protect a particular waterway, depending on habitat size, but in many cases the setback will need to be greater than this. In my memo, I state "*In summary, with understanding of the local geohydrology, stormwater conveyance and treatment, along with the distribution of pervious land, springhead discharge can be preserved. If discharge can be preserved, when combined with a wider, more biodiverse riparian buffer, ecological values in the springs and wetlands can be protected and enhanced.*" This was meant in the context that while many waterways are fenced a 10m buffer is appropriate as a <u>minimum</u> setback (i.e., it will be appropriate in most, but not all cases).

18 At Appendix E of the Section 42A report, Dr. Burrell at paragraph 21 admits that a defensible buffer is difficult to state without detailed information on soil, hydrology, and vegetation, and I agree with that statement. Detailed local information will become available at the AEE (resource consent) level, and this information is integrated into a wetland management plan, including planting plans, species lists appropriate for the soil, and once green space boundaries are determined, ecological buffers and setbacks can be further advised.

19 Dr. Burrell at paragraph 23 notes that, unfortunately, I do not provide buffer distances, other than providing District Plan compliance. For assistance with this matter, I provide some comparative setback figures from other developments I have been involved in, and some guidelines for this area further on in my evidence.

20 I note that in the Selwyn District Plan, earthworks (Rule 2.1.1.4) and the siting of buildings (Rule 4.15.1) is only permitted where it does not occur within (noting that resource consent for a discretionary activity would be required if compliance is not met):

20.1 20m of any waterbody listed in Appendix 12 (which includes LI Creek and LI River); or

20.2 10m of any other waterbody (excluding aquifers).

21 As outlined in our memo dated February 2021, AEL visited every spring location indicated on Canterbury Maps. This was undertaken by foot, and where the spring locations were more spaced, by 4WD. Our survey track file is superimposed over the Canterbury map data in App. I, Fig. iv (of the February memo).

22 Based on the ground-truthing, ten of the Canterbury Map spring locations had no wetland habitat or ground form in their vicinity, which were probably misinterpretations of aerial photos. There are 29 ground-truthed locations containing water in the summer, or at least hydrophytic (i.e. water-loving) plants, indicative of intermittent aquatic values. In the field, we noted conspicuous wetlands were displaced in respect to the Canterbury Maps locations, in the order of 20 or so metres, in various directions. The wetlands we located were assumed to be represented by the nearest spring location shown on Canterbury Maps. The error could be GPS/atmospheric error or mapping/rounding errors in Canterbury Maps. Overall, given the extent of this ground survey (Fig. ii – attached to the evidence), we are confident that we found all the wetlands in the proposed development area.

23 The proposed development zone west of Springs Road was not physically surveyed. However, no springs or wetlands are indicated in this area on Canterbury Maps. Nor are there any springs directly north of the development area in the Verdeco development. There are two springs indicated in Canterbury Maps about 400 m south of Collins Road, but I consider these of dubious veracity.

24 We have superimposed these actual wetland areas on the Outline Development Plan, which is presented in Fig. i (attached to my evidence).

25 This ground-truthing exercise demonstrated that the wetlands fall in two large areas of planned greenspace;

- around the headwaters of Springs Creek; where a recreational reserve is proposed.

- To the south-east of the site near the headwaters of the waterways draining to Collins Road, and the Reserve and Stormwater/Reserve Area further east.

26 Partly as a consequence of the ground survey, the Outline Development was revised to avoid clear conflicts between proposed developments and verified spring locations. There are no known conflicts between the distribution of ground-truthed springs and residential development areas. All verified springs occur in greenspace, whether it is recreational reserve, stormwater reserves, or esplanade strips.

27 In respect to his para 25, Dr Burrell questions why we did not use, at the time recently released, MFE wetland delineation guidelines (Ministry for the Environment 2020c) for the wetland survey. However, a principal objective, in addition to ground-truthing the location of wetlands, was to check for the presence, or absence of the endangered Canterbury mudfish, hence a degree of focus at fishing as many of the wetlands as possible. With the establishment of two spring clusters, the intensive work for wetland delineation can be restricted to that to determine the greenspace boundaries. In almost all cases, we found the ecotone between dryland vegetation and wetland vegetation quite distinct. In short, wetlands were easy to identify due to the sharp boundary between dryland vegetation and hydrophytes. For the Plan Change level, we did not feel the need to undertake an assessment of soils and vegetation community for every spring, but with a focus to ensuring the full spring distribution was identified.

28 However, if a future wetland delineation confirms natural wetlands on-site, a buffer of 100 m must exist between the wetland delineation terminus and any buildings or planned earthworks and/or the reserve boundary. In this respect, while I agree with Dr. Burrell in that wetland delineation needs to take place, for the purpose of pegging green space boundaries at the planning stage, I venture it needs to be undertaken on wetland boundaries facing out towards the greenspace boundaries, and not for every wetland. This is because the springs and wetlands are clustered in two areas, as outlined above and in Fig. i. I am confident, that, with the spring fields confirmed, the green space boundaries can be adjusted, if necessary, to accommodate the delineated wetland boundaries and their buffer.

29 The south-east spring field (green-ring in Fig. i) falls across a wetland/reserve area, or recreational area, where greenfield setbacks can be established.

30 Buffer strips and setbacks are not defined in the MFE NES 2020 for freshwater other than that assessment of 'appropriate setbacks' (Ministry for the Environment 2020b).

The CRPS, as quoted by Dr. Burrell, suggests setbacks should be set in ecological context, presumably after a comprehensive multi-faceted study. I accept this, but it is difficult to undertake such a study and apportion setbacks at the Plan Change level, which is why I didn't, other than note compliance with the District Plan as a minimum.

31 As a local example, the Christchurch District Plan (Rule 16.6), imposes 10 m development setback on upstream waterways (i.e., the upper reaches of rivers), and a 7 m development setback for an 'environmental asset standing water body'. This is apparent in the subdivisions we have been involved with. For example, for the Longhurst residential subdivision, on Quaifes Road, the springfed channel has a buffer of approximately 10 m, and this is the same as Highsted on Tullet, and through the Prestons subdivision for Ngai Tahu property. For the three springheads on the school ground at the corner of Quaifes and Murphys Road (77 Murphys Road), there is a vegetated buffer of 10 m, and no hardstand or development for about twice that. However, for the Wai Tapu spring on the Styx River, just downstream of the Main North Road, the setback is significant (c. 86 m x 57 m), with the spring protected from development by the Janet Stewart Reserve. Thus, while the minimum setbacks are quite minimal, there is scope for larger setbacks depending on cultural or environmental context which can and would be delineated prior to or at submission of the subdivision consent.

32 The Christchurch District Plan does not specify a setback for spring heads unless it is considered as an environmental asset standing water body. For the record, AEL does not suggest a minimum 7 m setback is environmentally appropriate, but that local plan environmental standards appear to be low in respect to public expectations, and what would be now regarded as environmentally acceptable. Some years ago, AEL was involved in the green field survey and monitoring for the Liffey Springs residential development, and the large springhead has a setback from the road (Liffey Springs Drive) to bank edge, of approximately 20 m.

33 We note that proposed Selwyn District Plan imposes a 25 m setback for the LII River within the Lincoln Township, which Lincoln South would become, and a minimum of 20 m buffer strip is recommended for Springs Creek, reflecting its greater width, and its importance as an ecological pathway for inanga (i.e. whitebait), eels, and native bullies. The buffer strip could include pervious pathways, and we would recommend viewing platforms to optimise the continuity of the native-planted riparian border elsewhere. In addition to nutrient interception, a width of 20 m will provide ecological function if planted densely with native vegetation.

34 Unless there are ecological matters of national significance, I would suggest a springhead setback of 30 m from developments. For narrow waterways, a 10 m planted setback, which could include a pervious footpath material, would protect the waterway adequately. This appears to be a *de facto* buffer strip width in the mid-Canterbury area. This width provides adequate shading and nutrient uptake in waterways with a width of a metre or two. It is recommended that planting is close, and overhanging, the water's edge, but observation platforms could be interspersed along each bank to facilitate ecological dispersal. Bank stability and refuge is important for resident koura and native fish.

35 Ecological dispersal (e.g. flight paths for birds, insects, negotiable water passage for fish) are critical for completion of life cycles. Culverts will be placed according to the fish passage guidelines (Ministry for the Environment 2020a), and, where possible, bridges will be preferred over culverts.

36 It is essential for the spring health to understand the groundwater flow into the springs at the south-east. Springs near the stormwater basins would benefit from leaching from the basins. Springs in the Stormwater Management Area, and the south-east Stormwater Wetland/Reserve (Fig. i, green ring) would benefit from the significant amount of pervious land soakage, and leakage from the stormwater treatment basins.

37 The springs in the north would be associated with general residential housing, and esplanade reserve land. The springs are close to the north boundary of the development, and trenching in the neighbouring development to the north should be designed to prevent groundwater entrainment away from groundwater supplying the northern spring field.

38 Wetland management plans will be required to monitor the spring fields in the north and south-east. This should cover hydrology, seasonal water level variation, and ecology of important wetlands in each of the two principal spring fields. Provided the setbacks are of a magnitude to protect habitats (i.e. 10m to 30m as discussed above in paragraphs 33 and 34), provide ecological function, and groundwater influx while ecological corridors are maintained, then the aquatic ecology of the springs can be improved.

39 Furthermore, with environmental monitoring, native plantings to support riparian instream ecology, and the maintenance of groundwater influx into the spring recharge zones, it should be possible to improve the somewhat degraded state of the spring wetlands in the development area. If these objectives can be achieved, the area is likely to provide significant amenity value to residents and the greater Lincoln community.

CONCLUSIONS

40 The proposed development area includes two distinct zones of spring fields. The springs will all lie in an encapsulating reserve land in the form of stormwater management area, stormwater wetland/reserve, green space reserve, or esplanade strip. It is essential springhead groundwater influx for both spring fields needs to be preserved to provide ecological function. Setbacks should be generous for springs, to maintain the spring flow and the instream and riparian ecology. Spring development offset is recommended at 30 m for each confirmed spring location. A buffer strip of 10 m is adequate for the narrow waterways, but a 20 m buffer strip will benefit the larger Springs Creek.

Dated: 4 November 2021

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Mark Taylor

References:

Ministry for the Environment 2020a. National Policy Statement for Freshwater Management. New Zealand Government, Wellington. *No*. 70 p.

Ministry for the Environment 2020b. Proposed National Environmental Standards for Freshwater. New Zealand Government, Wellington *No*. 25 p.

Ministry for the Environment 2020c. Wetland delineation protocols. Ministry for the Environment, Wellington. *No*. 10 p.

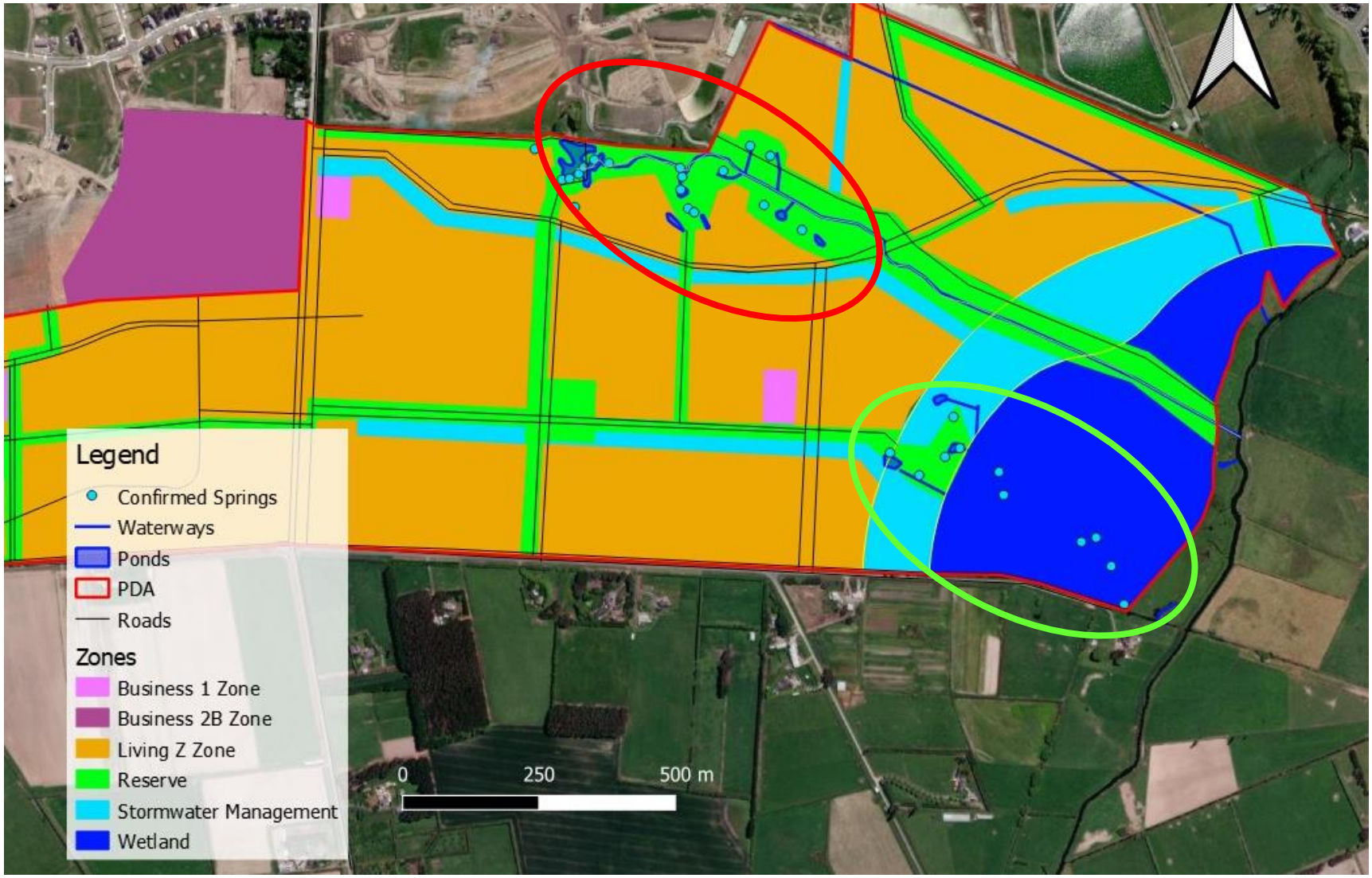

Figure i. Distribution of 29 ground-verified Canterbury Map spring locations containing water or wetland indicators overlaid the Outline Development Plan. Canterbury Map locations may be ±20 m from round-truthed features. The ringed areas represent the principal spring fields mentioned in the text.

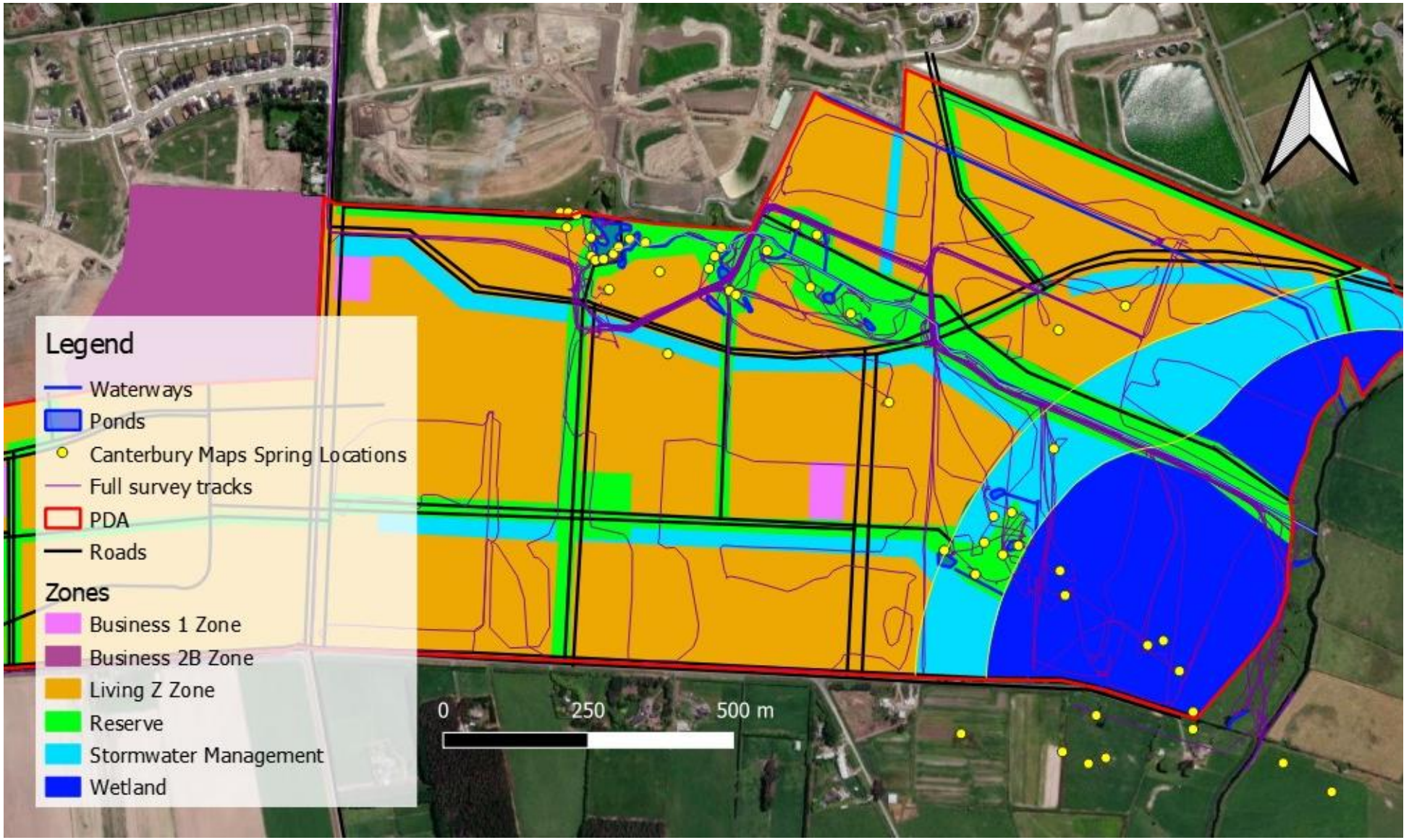

Figure ii. All spring locations on Canterbury Maps, and most surveyor's track files (red). Some spring locations near the homestead were investigated without a tracking file.