BEFORE AN INDEPENDENT HEARINGS COMMISSIONER
ON BEHALF OF SELWYN DISTRICT COUNCIL

UNDER	the Resource Management Act 1991
IN THE MATTER	a request by Hughes Development Limited for a private plan change to the Selwyn District Plan to rezone 163 Halkett Road and 1066 West Coast Road in West Melton for the development of approximately 124 lots
AND	**Hughes Development Limited** (Applicant)

EVIDENCE OF VICTOR MTHAMO ON BEHALF OF HUGHES DEVELOPMENT LIMITED

Highly Productive Land

13 March 2023

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Introduction

1. My name is Victor Mthamo.

2. I am a Principal Consultant for the environmental science, engineering and project management consultancy Reeftide Environmental and Projects Limited (**Reeftide**). I have been in this role for over 12 years. Prior to this I was a Senior Associate with the surveying, environmental science and engineering, and resource management consulting firm CPG New Zealand Limited (now rebranded to Calibre Consulting Limited), where I was also the South Island Environmental Sciences Manager. I have worked in the area of environmental science and engineering for over 27 years.

3. I have the following qualifications: Bachelor of Agricultural Engineering (Honours) with a major in Soil Science and Water Resources (University of Zimbabwe); Master of Engineering Science in Water Resources (University of Melbourne); Master of Business Administration (University of Zimbabwe). I hold an Advanced Certificate in Overseer Nutrient Management modelling qualification. I am a member of Engineering New Zealand (**CMEngNZ**), a Chartered Professional Engineer (**CPEng**) and an International Professional Engineer (**IntPE**). I am also a past National Technical Committee Member of both Water New Zealand and New Zealand Land Treatment Collective (**NZLTC**).

4. In my role as an environmental consultant and chartered environmental engineer I am involved in all areas of the Three Waters (water supply, stormwater and wastewater). This includes resource consent applications, assessments of environmental effects, modelling of flows, catchment hydraulic, hydrological analysis, soil assessments, and irrigation engineering. In addition, I have specific expertise in the development of effective and sustainable rehabilitation plans for quarries. In that context I focus on ensuring that a rehabilitated site can be used for as many land use options as are possible and permissible under the current statutory planning requirements. Through this work I have gained specific expertise in soil use, soil assessments and strategies to ensure the soil production potential is maintained or realised.

5. My specific experience relevant to this evidence includes:

   a. Stormwater planning, catchment hydraulic and hydrological modelling and design.

   b. Presenting evidence at a regional council hearing on catchment wide modelling that I carried out to assess the effects of flooding in the lower reaches of the Waitaki catchment in South Canterbury.

   c. Regular engagement by Christchurch City Council (**CCC**) as a Three Waters Planning Engineer. In this role as a stormwater planning engineer I review stormwater designs and modelling by various engineers from consulting firms and I peer review their reports (concepts, calculations and detailed designs) and provide them with the required guidance for solutions that are acceptable to the CCC. As a result, I am conversant with various hydrological modelling tools, flooding assessments and flood mitigation.

   d. Designing and implementing of numerous on-farm irrigation schemes, soil investigations and land use assessments. Examples of projects include Hunter Downs Irrigation Scheme, North Bank Hydro Project, Mararoa-Waiau Rivers Irrigation Feasibility Study and the North Canterbury Lower Waiau Irrigation Feasibility Assessment.

   e. Assessing large subdivisions in relation to stormwater management, earthworks and the associated actual and potential impacts on soils, groundwater and surface waterways and how to effectively use erosion and management control plans to mitigate the potential impacts that may occur during the construction works.

   f. Assessing effects on soils and groundwater associated with onsite and community wastewater discharge systems such as the Wainui Community wastewater discharge consent.

g. Assessing actual and potential effects on groundwater and surface water associated with groundwater and surface water takes.

h. Providing quarry soils and rehabilitation expert evidence for the extension of the Road Metals Quarry on West Coast Road in Templeton in 2018. My evidence at the hearing covered the effect on soils and groundwater resulting from the changes to site levels post rehabilitation. I assessed the effectiveness of adopting a 300 mm topsoil layer and whether or not this was sufficient for plant growth and providing contaminant attenuation, treatment and removal to protect the underlying groundwater.

i. Acting as a soils and rehabilitation expert witness for the proposed Roydon Quarry in Templeton in 2019 and 2020. Fulton Hogan's proposal was for the establishment of a quarry and extraction aggregate. I provided an assessment of the soils' versatility and the effect of the requested changes to the land use on the land's productivity potential.

j. Acting as an expert witness at the proposed Fulton Hogan Miners Quarry extension in 2020 and 2021. I provided an assessment of the soils, their versatility and productivity potential with and without mitigation post quarrying.

k. More recently, I have been involved with a number of Plan Changes (**PC**). These include:

    (i) Plan Change 66 (PC66) in Rolleston.

    (ii) Plan Change 67 (PC67) in West Melton.

    (iii) Plan Change 68 (PC68) in Prebbleton.

    (iv) Plan Change 71 (PC71) in Rolleston.

    (v) Plan Change 75 (PC75) in Rolleston

6. As set out in the evidence of Mr Brown, Hughes Developments Limited's (**HDL**) proposal to enable residential development on the subject site, being 163 Halkett Road and 1066 West Coast Road,[1] West Melton (the **Site**), is currently the subject of a plan change request to the Operative Selwyn District Plan (**PC74**), which seeks to rezone the Site from a rural to a residential zone.

7. To inform that request, I was engaged in July 2022 to assess the capacity of the Site to support primary production. That involved a site visit to acquaint myself with the Site and desktop assessments of the soils.

Scope of evidence

8. My evidence is presented on behalf of HDL. It addresses matters relevant to the capacity of the Site for primary production, and in particular, criteria relevant to rezoning of the Site under the National Policy Statement for Highly Productive Land 2022 (the **NPS-HPL**).

9. In preparing this evidence, I have reviewed:

   a. PC74, and its supporting technical assessments (dated 5 May 2022, and updated 4 October 2022);

   b. The evidence of Mr Brown, Mr Ford, Mr Colegrave and Mr Hainsworth;

   c. The NPS-HPL;

   d. The Council Officer's section 42A report on PC74;

   e. Relevant submissions on PC74.

Code of conduct

10. 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

1 Legally described as Lots 1 and 2 DP 34902.

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.

Executive summary

11. Between 95 – 100% of the Site has Land Use Capability (**LUC**) Class 3 soils.

12. Consequently, if the other elements to the NPS-HPL's definition of "highly productive land" (**HPL**) are satisfied, then the provisions of that national direction will apply to the decision on whether to rezone the Site in the manner sought by HDL. I understand that rezoning can only occur under NPS-HPL where it is necessary to meet the development capacity requirements of the National Policy Statement on Urban Development 2020 (**NPS-UD**), and where:

    a. There are no other reasonably practicable and feasible options for providing that capacity within the same locality and market while achieving a well-functioning urban environment; and

    b. The benefits of rezoning outweigh the long-term costs associated with the loss of HPL for land-based primary production, taking into account both tangible and intangible values.

13. In terms of (a), HPL (as it is defined under the NPS-HPL) surrounds the West Melton township, extending out to Rolleston (to the south) and Old West Coast Road (to the north). I have looked at alternative sites within this area, and, having regard to the various factors relevant to productive capacity, I have not identified any sites which in an overall sense would be less suitable for land-based primary production than the Site. That is in large part because, as set out in my evidence, the ability of the Site to support primary production over the long term is so compromised.

14. For that same reason, it is my opinion, supported by the evidence of Messrs Hainsworth, Colegrave and Ford, that the long-term environmental, social and economic costs associated with the loss of the Site for primary production are negligible. The key 'ingredients' for

successfully establishing the different land-based primary production activities described in the NPS-HPL do vary[2]. However, there are some 'constraints' which will (in some cases significantly) affect the productive capacity of any site. These include moisture limits and irrigation availability, nutrient limits, characteristics of soils, and reverse sensitivity effects.

15. The Site is impacted by each of these factors:

a. Soils. While the soils are predominantly classified as Land Use Capability (**LUC**) 2 – 3, there is significant variability in the nature and extent of those soils across the Site. Some spatial variability even over short distances affect the management of the land. As discussed in the evidence of Mr Hainsworth, the variable nature of soil occurrence with a deep sandy soil and a loamy soil on gravels within the Templeton soil units leads to issues with differences in germination times, irrigation needs during the growth of crops, in optimal harvest dates; and variability in yields within what is already only a small area of land.[3]

b. Moisture deficits and irrigation availability. The Site does not currently have the benefit of any resource consents which would authorise irrigation of the land for any purpose, including to support primary production. It is currently not possible to apply for new resource consents for that purpose, so irrigation of the Site could only occur if existing consents were transferred from other sites.

c. Nutrient limits. In my opinion, the Site soils are such that application of nutrients to the Site would be essential to supporting land-based primary production activities. However, strict nutrient limits are currently in place through the Canterbury Land and Water Regional Plan (**CLWRP**) which would significantly constrain the use of nutrients at the Site. In my opinion, those limits are unlikely to ease in the short or medium term.

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2 Refer NPS-HPL, clause 1.3, *land-based primary production* means production, from agricultural, pastoral, horticultural, or forestry activities, that is reliant on the soil resource of the land.

3 Evidence of Mr Hainsworth at paragraph 39.

d. Adverse effects, including reverse sensitivity. Establishing primary production on the Site (including necessary improvements to its productive capacity) will involve activities that can have adverse effects on surrounding uses. Attempts to address those effects can then constrain use of the land for primary production. The Site is located on the immediate boundary of an existing neighbourhood, and across the State Highway from another. In my opinion, establishing and maintaining any primary production activities will result in adverse effects on those neighbours which could only be managed through the use of a dense landscaped buffer. That buffer would in turn reduce the availability of land for the actual production activities, in turn further limiting its productive capacity.

16. Alongside these factors, the 'costs' of losing the Site for land-based primary production must also, in my opinion, be considered in the context of land which would remain available for those activities within the Selwyn district and the Canterbury region. In particular, of all the "HPL" in those geographical areas, the Site represents a reduction of only 0.002% and 0.014% respectively.

17. Put simply, HDL's Proposal would result in the loss of negligible amount of land which, while it may be "highly productive" in terms of the NPS-HPL definition, is subject to a number of constraints which significantly limit its productive capacity over the long term. Its soil profile combined with its immediate proximity to the West Melton township means that there are few, if any, alternative sites within the wider West Melton area which would be less suitable in an overall sense for establishing primary production activities.

18. In that context, I support PC74 in terms of clause 3.6 of the NPS-HPL and the wider objectives of that document.

The Site

19. The Site is 20.69 ha and comprises two certificates of title. It is currently divided into numerous rectangular and triangular paddocks of different sizes. There is an existing dwelling on 1066 West Coast Road and both parcels of land have farm buildings. The topography is

generally flat with some gentle undulations and depressions, which run in a northwest/southeast direction. These have resulted from remnant river channels. Existing shelterbelts are found along many of the internal boundaries.

20. To the north and east of the Site is rural land used for grazing and other agricultural activities. The southern boundary is bordered by West Coast Road with Wilfield residential subdivision to the south of this road. Over the western boundary of the site is the Gainsborough subdivision. This is part of the West Melton residential area which includes a small shopping area, school and pre-school.

Existing soils

21. Mr Hainsworth's evidence contains a detailed description of the Site's soils profile.[4] The soils are predominantly Eyre and Templeton soils with small amounts of Halkett soils. The Site soils are discussed in more detail in the evidence of Mr Hainsworth. In summary:

    a. The Templeton soils are loamy, moderately well to well drained.

    b. The Eyre soils are also loamy, moderately well drained to well drained. These soils are very shallow on river gravels.

    c. A small amount of Halkett soils occurs in the north of the block.

    d. Soils within the Site generally have an unpredictable pattern at a mappable scale (common in alluvial areas) and this has implications on management and productivity of the land as I have discussed in Paragraph 15(a) above.

Land Use Capability

22. The LUC classification arranges different kinds of land according to those properties that determine its capacity for long-term sustained production.[5] There are eight different classes, illustrated on Figure 1 below. As set out further below, the LUC classification of a site is one of the key 'criteria' in determining whether that site meets the NPS-HPL definition of "HPL".

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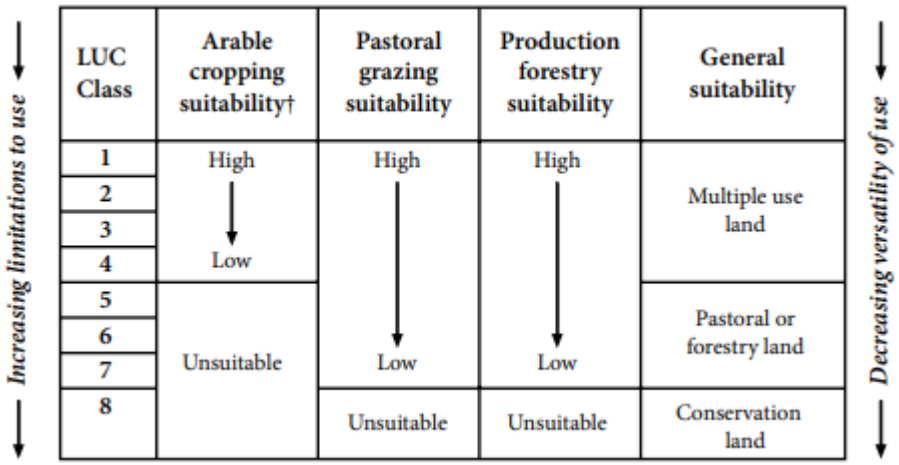
4 Evidence of Mr Hainsworth at table 1.

5 Land Use Capability (LUC) Survey Handbook, 3rd edition (tupu.nz), page 8.



23. As shown in Table 1 below, under the New Zealand Land Resource Inventory default mapping, the Site is comprised of LUC 2 and 3 soils.

Table 1 – Gross Default LUC Classes within the Site

LUC Class	Area (ha)	%age
LUC 2	3.15	15%
LUC 3	17.54	85%
Total	**20.69**	**100%**

24. As part of his assessment, Mr Hainsworth has undertaken more detailed mapping of the Site's soils.[6] His conclusions regarding the LUC status of those soils are illustrated in Table 2 below.

Table 2 – Site Specific LUC Classes within the Site

LUC	Area	Percentage
3s + 2s	2.8	14%
3s	1.3	6%
3s + 4s	4.1	20%
3s	11.1	54%
4s + 3s	1.1	5%
Totals	**20.4**	**100%**

25. As set out in his evidence, the "s" in Table 2 refers to 'soil' and indicates that the dominant limitation for the soils in question is within the 'rooting zone'. The significance of this for productive capacity is discussed below.

26. The LUC 3 classes in Table 2 means the soils are theoretically suitable for a wide range of arable cropping activities, although these are subject to moderate physical limitations. However, establishing crops

[6] Evidence of Mr Hainsworth at table 1.

with deeper rooting depths would be somewhat constrained due to the shallow soil profile depths, as discussed in more detail in Mr Hainsworth's evidence.[7]

National Policy Statement on Highly Productive Land

27. The NPS-HPL aims to protect HPL for use in land-based primary production, both now and for future generations. "Land-based primary production" encompasses production from agricultural, pastoral, horticultural, or forestry activities that are reliant on the soil resource of the land.[8] To achieve this, the NPS-HPL requires the identification of HPL at a regional level, and imposes varying levels of constraint on the rezoning, subdivision, land use and development of that land.

"Highly productive land"

28. Until that regional identification (through mapping) occurs, the NPS-HPL (including its various constraining provisions) will only apply to land that, at the commencement date of the NPS-HPL, meets the transitional definition of HPL.[9] The two inclusionary criteria for that definition are that the site is:

    a. zoned general rural or rural production; and

    b. LUC 1, 2 and 3 land.

29. "LUC 1, 2 and 3 land" is defined in the NPS-HPL as land identified a Land Use Capability Class 1, 2 or 3, as mapped by the NZLRI or by any more detailed mapping that uses the Land Use Capability classification.

30. As illustrated above, the NZLRI mapping and the more detailed mapping undertaken by Mr Hainsworth confirm that at least the vast majority (95%) of the Site is "LUC 1, 2 and 3 land".[10] Consequently, if the Site meets criteria (a) (and is not otherwise excluded by the

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7 Evidence of Mr Hainsworth at paragraph 27.
8 National Policy Statement for Highly Productive Land 2022, clause 2.1.
9 National Policy Statement for Highly Productive Land 2022, Clause 3.5(7).
10 Evidence of Mr Hainsworth at paragraph 34.

remaining criteria)[11], it will meet the definition of HPL in clause 3.5(7).

Rezoning criteria

31. If the Site does meet that definition, then rezoning of it for urban purposes (as PC74 seeks) is only authorised under the NPS-HPL where:

    a. the rezoning is required to meet the development capacity obligations of the NPS-UD; and

    b. there are no other reasonably practicable and feasible options for meeting those obligations within the same locality and market while achieving a well-functioning urban environment; and

    c. the benefits of the urban rezoning outweigh the longer-term environmental, social, cultural and economic costs associated with the loss of HPL for land-based primary production, taking into account both tangible and intangible values.[12]

32. In assessing (b), consideration must be given to a range of options including rezoning of land that is not highly productive as urban, and rezoning different HPL that has a relatively lower productive capacity.

33. It is understood that the NPS-UD requirements will be addressed in the evidence of Mr Colegrave and Mr Jones. The focus of my assessment is therefore on supporting the alternative options assessment required under (b). The cost-benefit analysis associated with the loss of the Site for land-based primary production under (c) is discussed in more detail in the evidence of Messrs Hainsworth, Colegrave and Ford.

34. Critical to both parts of that assessment is, however, the productive capacity of the Site itself. Identification of preferable alternative locations for primary production will depend (in part) on the capacity of those locations to accommodate primary production compared to the Site. Similarly, any costs associated with the loss of HPL also directly correlate to its relative capacity to support primary

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11 Land which is identified for future development or subject to a Council initiated, or adopted, notified plan change to rezone it from general rural or rural production to urban or rural lifestyle, is excluded from the transitional definition of HPL.

12 NPS-HPL, clause 3.6(1).

production over the long term. Where the land in question has negligible productive value, then any costs associated with the loss of that land will be negligible.

Productive capacity of the Site

35. "Productive capacity" is defined in the NPS-HPL as "the ability of the land to support land-based primary production over the long term, based on an assessment of:

    a. Physical characteristics (such as soil type, properties, and versatility); and

    b. Legal constraints (such as consent notices, local authority covenants, and easements); and

    c. The size and shape of existing and proposed land parcels.

36. Similar guidance has previously been given by the Environment Court[13] on factors which indicate productive capacity (illustrated in Table 3 below).

13 *Canterbury Regional Council v Selwyn District Council [1997] NZRMA 25, Judge Treadwell presiding.*

Table 3 – List of Factors Determining Versatility (Treadwell, 1997[14])

Soil texture	Soil structure	Soil water holding capacity
Soil organic matter stability	Site's slope	Site drainage
Temperature of the site	Aspect of the site	Stormwater movements
Floodplain matters	Wind exposure	Shelter planted
Availability of irrigation water	Transport, both ease and distance	Effect of the use on neighbours
Access from the road	Proximity to airport	Proximity to port
Supply of labour	Previous cropping history	Soil contamination
Sunlight hours	Electricity supply	District scheme
Economic and resale factors		

37. Based on my desktop analysis and observations from my Site visit, a number of these factors are engaged at the Site which, in my opinion, would significantly constrain the ability to undertake land-based primary production at the Site. These are described below, and where applicable, I have discussed the extent to which those limitations could be feasibly managed (or not).

Soil Properties

38. Mr Hainsworth's assessment (described in his evidence) shows that the soils on Site are predominantly LUC 3s.[15] This theoretically indicates their suitability for arable cropping.[16] However, within each soil type and between soil types, Mr Hainsworth's assessment confirms that there are, in some cases, significant variations in soil depths and stoniness, sometimes within short distances.

39. This can have adverse implications on the management of the soils and crops. For example, the variable nature of soil occurrence with a deep sandy soil and a loamy soil on gravels within the Templeton soil units can lead to differences in germination times, differences in irrigation needs during the growth of crops, and differences in optimal harvest dates. It can also lead to variability in overall yields, which

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14 *Canterbury Regional Council v Selwyn District Council [1997] NZRMA 25, Judge Treadwell presiding.*

15 Evidence of Mr Hainsworth at paragraph 34.

16 Lynn et al., (2009), Land Use Capability (LUC) Survey Handbook, 3rd edition (tupu.nz).

further impacts the economic viability of primary production on what is already a small area of land.

Soil moisture

40. In his assessment of the Site soils, Mr Hainsworth noted that the soils in LUC Class 3 land on stony flats and terraces has moderate physical limitations to arable use with low moisture holding capacity (droughty).[17]

41. The droughtiness highlighted by Mr Hainsworth is magnified by the Site's climate.

42. I analysed the soil moisture deficits for the Site using the climatic data from the Selwyn District Council Burnham Wastewater Treatment Plant (Agent No 4880). This station has data from 1953 to 2020.

43. The analysis showed that:

    a. There was an average of 109 and a maximum of 167 days per year when soil moisture deficits were experienced. Most of these deficits were from later in spring and throughout the summer months.

    b. The mean monthly moisture deficits in the summer months range from 55-146 mm.

    c. The maximum moisture deficits in the summer months range from 86-149 mm.

44. These soil moisture deficits demonstrate the critical need for irrigation water if agricultural productivity on the Site is to be maximised, as these soil moisture deficits stunt crop growth regardless of the soil's natural capital.

45. Below, I discuss the availability of water to meet the assessed soil moisture deficits.

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17 Evidence of Mr Hainsworth at paragraph 30.

Water availability/irrigation

46. I assessed the irrigation water requirements for the Site using a software programme called IrriCal[18]. This tool is approved by Environment Canterbury and uses one of the methodologies recommended in the Canterbury Land and Water Regional Plan (**CLWRP**) i.e., it estimates the irrigation requirements in 9 out of 10 years for pasture assuming an irrigation system with an 80% efficiency.

47. The annual irrigation volume I estimated using IrriCal is 126,195 m^3 (using one soil profile available water depth). This volume is based on pasture. Volumes for other crops (arable and horticultural) will be 90-110% of the pasture volumes).

48. I also checked the Canterbury Maps GIS to see if there were any consents within the Site that would supply the required irrigation volume. There are currently no resource consents authorising groundwater take for irrigation within the Site.

49. Given that the Site is within a red zone (over-allocated) groundwater catchment, new consents to take water for irrigation are prohibited under the CLWRP.

50. Purchasing and transferring a water take from within the zone may be possible, however I consider it would be difficult for the following reasons:

    a. Current demand for these consents is high limiting their availability for the Site.

    b. I also expect demand for these consents to increase due to the effects of climate change on (i) plant demand which means more and more water will be needed to maintain the current productivity and (ii) there will be less and less water available to recharge the groundwater zones.

    c. When undertaking any renewal of consents, the CLWRP requires 50% of any volume transferred be surrendered. This means twice the volume required will need to be sought i.e. a consent with

[18] http://mycatchment.info/.

an annual volume of 252,390 m^3/year would have to be purchased to provide for the annual volume of 126,195 m^3/year.

d. From my experience consents have been traded at >$1.10/$m^3$. Therefore, the cost of water would also be a significant hinderance to productivity.

51. It is also unlikely that water from Central Plains would be available for the Site given the number of properties upstream of the Site for which it would be more economic to irrigate with Central Plains water.

52. The unavailability of irrigation water and/or the high cost to access water makes the economics of irrigated production a significant hindrance to intensive production.

Nutrient Limits

53. Strict nutrient limits currently apply to primary production activities. The CLWRP includes numerous provisions that regulate land use and farming activities. These provisions make it difficult to intensify land use and agricultural production and thus constrains the productive potential of the land/soils irrespective of the LUC Class. Examples of policies in the CLWRP that relate to farming intensity are:

a. Policies 4.34-4.36 relate to management of nutrient loss from farming among other activities.

b. Policies 4.37 to 4.38H which apply to individual farming activities, nutrient user groups and farming enterprises.

c. Policy 4.38 which restricts increases in nitrogen loss from farming activities to no more than a total of 5kg/ha/yr above the Baseline GMP Loss Rate.

d. Policies 4.41A-D require that applications for resource consents for farming activities be accompanied by a Farm Environment Plan that has been prepared in accordance with Schedule 7.

e. Policy 4.74 require resource consents for the use of land for farming activities and the associated discharge of nutrients in catchments that are zoned Red. The rezoning request area is a

Red Nutrient Allocation Zone.

54. The CLWRP Plan Change 7 will also limit some farming activities (e.g., commercial vegetable growing operations) due to the proposed nutrient limits.

55. These limits seek to address excessive groundwater nutrient concentrations in catchment over which the Site lies. The effects of these limits have been identified in various literature. For example:

    a. A Landcare Research study called "Modelling Economic Impacts of Nutrient Allocation Policies in Canterbury: Hinds Catchment" in 2013 prepared for the Ministry for the Environment[19] concluded that loss in productivity could result in revenue reductions of up to 41% with an average of 14% across the farming systems studied.

    b. Reports prepared by the Agribusiness Group (2014)[20,21] on behalf of Ministry for Primary Industry found significant reductions in yield and profitability resulting from nutrient reductions.

    c. The Agribusiness Group reports also include budgets showing losses for some crops with the conclusion that "At the 10% reduction in the amount of nitrogen applied the Gross Margin result is reduced to approximately one third to a half of that under the Status Quo situation and from there it dips towards a close to breakeven scenario which means that it would not be economic to grow the crop. This reflects the relatively tight margins which these crops are grown under".

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19 Landcare Research (2013). Modelling Economic Impacts of Nutrient Allocation Policies in Canterbury: Hinds Catchment. Prepared for the Ministry for the Environment. https://environment.govt.nz/assets/Publications/Files/modelling-economic-impacts-of-nutrient-allocation-policies-canterbury.pdf

20 The Agribusiness Group (2014). Nutrient Performance and Financial Analysis of Lower Waikato Horticulture Growers. Prepared for MPI. https://www.horizons.govt.nz/HRC/media/Media/One%20Plan%20Documents/Nutrient-Performance-and-Financial-Analysis-of-Horticultural-Systems-in-Horizons-Region-2014.pdf?ext=.pdf.

21 The Agribusiness Group (June 2014). Nutrient Performance and Financial Analysis of Horticultural Systems in the Horizons Region. Prepared for MPI.

d. Samarasinghe et al (2011)[22] carried out research in the Hurunui District and concluded that reduction in nutrients below the baseline levels resulted in >5% loss in revenue. For some enterprises, this would be a net economic and financial loss.

56. The limits in the CLWRP are examples of initiatives being taken to mitigate these adverse effects resulting from excessive groundwater nutrient concentrations in the catchment (in which the Site is located). These concentrations primarily result from primary production activities (e.g. dairying and arable agriculture) of the 70s, 80s, 90s and early 2000s. The effects of the more recent (1980s to the present day) intensification in dairying and other agricultural activities will manifest over the next 20, 30, and 40 years, and in my opinion, are likely to be considerably worse than what the catchment is experiencing now because of this intensification.

57. For that reason, these mitigation initiatives – while important - are, in my opinion, highly unlikely to restore the nutrient levels to the pre-intensification levels. If that is to occur, greater limitations on the application of nutrients and nutrient rates should be expected. These constraints would further limit the capacity of the Site to establish and maintain land-based primary production.

Adverse effects (including reverse sensitivity)

58. Normal farming activities involve regular cultivation, planting, irrigating, fertilisation, spraying, and harvesting of crops. Dust, spray drift, droplets, vapour, solid particles are all associated with these activities, as is odour, and noise resulting from the use of machinery and vehicle movements. Where those effects are encountered (particularly by sensitive land uses, such as residential), attempts to address those effects (for example, through the establishment of a buffer) can constrain the use of the subject land for primary production.

59. As set out above, the Site is adjacent to the Gainsborough neighbourhood and across the State Highway from the Wilfield

[22] Samarasinghe , O. Daigneault A, Greenhalgh, S, Sinclair , R (2011) Modelling Economic Impacts of Nutrient Reduction Policies in the Hurunui Catchment, Canterbury. https://www.nzae.org.nz/wp-content/uploads/2011/Session4/42_Samarasinghe.pdf

neighbourhood. In my opinion, it is highly likely that the establishment and operation of any primary production would have adverse effects on these adjoining residential homes. It would however be difficult to manage those adverse effects without compromising the productive capacity of the Site.

60. Examples of mitigation include:

a. Creating strips (5-10 m wide) of land between the farm and the sensitive receptors to create buffers. This further reduces the area of land available for productive use.

b. Limiting the times when certain farming activities are undertaken. For example:

i. Use of farm machinery is limited to the hours of the day when people are at work with no use of machinery over weekend and public holidays.

ii. Limiting the cultivation of land to when wind speeds are below a specific threshold to avoid dust being blown to residential areas.

iii. Prohibiting the use of odorous sprays i.e. application of effluent.

Alternative options assessment

61. The rezoning criteria requires consideration of whether there are any sites within the same locality and market which could feasibly and practicably accommodate the proposed development capacity while achieving a well-functioning urban environment.

62. The area around West Melton, illustrated in **Attachment 1**, has been identified as the "same locality and market" for the purposes of (b) on the basis that it is:

a. In or close to West Melton as a location where demand for additional capacity has been identified;

b. Is for a market for the types of housing in demand (being larger lot residential).

63. I undertook a desktop review of the LUC Classes of the land in this area. The nearest land that is >LUC Class 3 is (a) southwest of Railway Road and west of Rolleston and (b) northeast towards Old West Coast Road. Land around the fringe of West Melton has the same or better LUC Class soils compared to the Site.

64. In my opinion, that land is likely to be subject to less constraints on productive capacity compared to the Site. In particular:

    a. Unlike the Site (which adjoins residential neighbourhoods on two sides), there is greater separation between that land and urban areas, which reduces potential reverse sensitivity effects.

    b. There are some sites within that area that have consented irrigation tanks.

65. Based on that review, I conclude that there is no land within that subject area that has overall lower productive capacity than the Site. Given the multitude of constraints I have discussed for this Site, I consider this land to meet the test provided in Clauses 3.6(2)(b) and (c) NPS–HPL relative to other land within the West Melton fringe.

66. Therefore, it is my opinion that if residential supply is needed, the Site is the appropriate location for that from a productive capacity perspective.

Cost-benefit analysis

67. In the discussion above, I have identified a number of factors which compromise the productive capacity of the Site. While techniques and options may be available to manage/address some of those factors, deployment of those techniques over the long-term would each incur costs which will impact the economic viability/benefits of using the Site for primary production activities. These are discussed in more detail in the evidence of Messrs Colegrave[23] and Ford.[24]

68. For the reasons set out above, I consider that there are other sites within the Selwyn district which have better capacity for primary production activities and can better support the economic and social

23 Evidence of Mr Colegrave at para 127.
24 Evidence of Mr Ford at paragraph 34.

wellbeing and resilience of communities through those activities. Comparatively, use of the Site for residential development as sought by PC74 will support those outcomes by:

a. providing new lots for housing development that will support everyday activities of people and communities.

b. integrating that development with an existing residential area, making efficient use infrastructure (e.g. water supply, wastewater, power etc) compared to what would be the case if subdivision was relegated to the areas that are >LUC Class 3 (Attachment 1).

Cumulative loss

69. In my opinion, any costs associated with the loss of the Site for primary production activities must be viewed in the wider context of available HPL. In Table 4 below, I give a sense of the proportional loss of LUC 1, 2 and 3 land within the district and the region as a result of the rezoning request for the Site.

Table 4 – NPS-HPL - Potential Loss in HPL (LUC 1, 2 and 3) as a Result of the Rezoning of the Site

LU Class	Canterbury (ha)	Selwyn (ha)	Site (ha)	Percentage of HPL Loss	
				Canterbury	Selwyn
LUC 1	23,200	6,522	-	**0.002%**	**0.014%**
LUC 2	270,500	46,111			
LUC 3	543,000	87,927	19.3		
Total Area	**836,700**	**140,560**	**19.3**		

70. Table 4 above shows that the reductions in HPL as a result of the rezoning request in the region and district would be insignificant.

Canterbury Regional Policy Statement and the Operative Selwyn District Plan

71. The Canterbury Regional Policy Statement (***CRPS***) define 'versatile soils' as those that are in LUC Classes 1 and 2. Class 3 is not included.

72. Based on Mr Hainsworth's more detailed mapping of the Site, there are no 'versatile' soils on the Site, and as such the directions within the CRPS regarding versatile soils are not relevant to PC74.

Conclusion

73. In summary, I support HDL's request to rezone the Site for residential development through PC74 in terms of the directions of the NPS-HPL on the basis that:

a. There are multiple long-term constraints on the capacity of that Site to support primary production activities.

b. In light of these constraints, the overall benefits of retaining this land for primary production are, in my opinion, negligible. That is especially given:

i. There are no other rural sites within the West Melton area that have lower productive capability or less constraints than the submitter's Site.

ii. The proportional reductions in HPL in the district and the region as a result of the rezoning of the Site are insignificant.

Victor Mthamo
13 March 2023

ATTACHMENT 1 – LUC CLASSES OF LAND IN AND AROUND THE SITE (NZRLI)