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TO	Carter Group Limited Attention – Tim Carter
FROM	Victor Mthamo
DATE	4 March 2025
FILE	318-2024 – Ryans Road Fast -track
VERSION	Final
SUBJECT	Ryans Road Fast-track Application - Assessment of Potential Loss of Productive Land

1. Introduction

1.1. Applicant's Proposal

Carter Group Limited (CGL) are seeking a land use and subdivision consent through the Fast-track process to use approximately 55 ha of land at 104 Ryans Road (the Site) for defined industrial purposes. CGL has engaged Reeftide Environmental & Projects Limited (Reeftide) to carry out a desktop assessment of the actual and potential effects of the proposed industrial use on the productive potential of land and soils.

1.2. Author's Qualifications and Experience

Victor Mthamo the author of this report is a Principal Consultant for the environmental science, engineering and project management consultancy Reeftide. He has been in this role for almost 13 years. Prior to this he 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 he was also the South Island Environmental Sciences Manager. He has worked in the area of environmental science and engineering for over 30 years.

Further details of Victor's qualifications and experience in undertaking similar work are detailed in Attachment 1.

2. Description of the Site

2.1. Site Location

104 Ryans Road, the application site, is legally described as Lot 4 DP 22679, Part Lot 3 DP 22679 and Part Lot 1 DP2837. Figure 1 below shows the location of the application site.

2.2. Existing Land Use in and Around the Site

Under the Christchurch District Plan the site is zoned Rural Urban Fringe as shown in Figure 1. The zoning of the surrounding land is as follows:

- Specific Purpose (Airport) Zone to the north and west boundaries.
- Rural Urban Fringe south across Ryans Road.
- Rural Urban Fringe east and southeast across Grays Road.

The Rural Urban Fringe in and around the site is generally used for small-scale cropping, and light pastoral grazing. However, there are lawfully established industrial/ commercial activities on the sites at 614 Pound Road (Outdoor Storage and Truckyard) and at 22 Ryans Road (Wood Incineration Activity).

2.3. Topography and Land Use

The site has a generally flat topography, refer to survey plans by Capture Land Development.

2.4. Surface Waterways

The nearest and only surface waterway is a drain that runs along the site's southern boundary and parallel to Ryans Road.

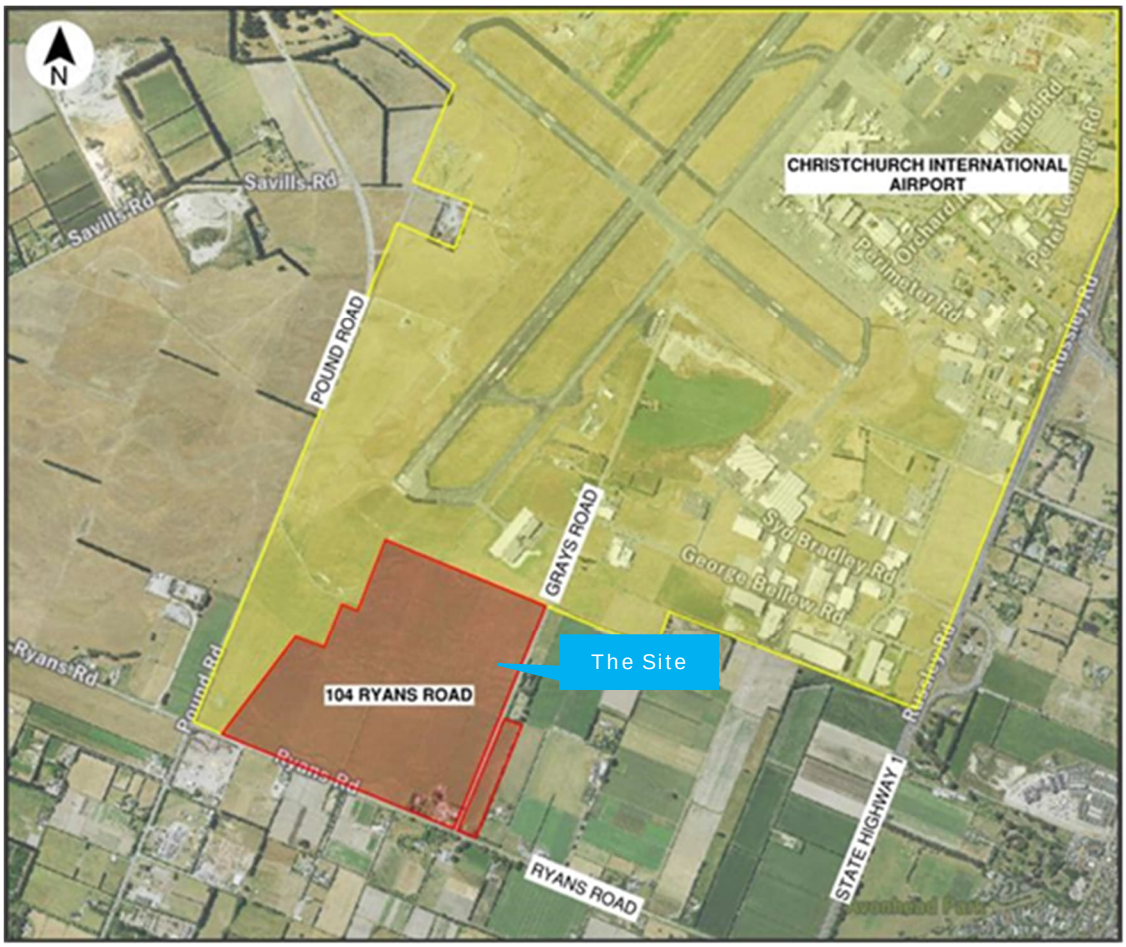


Figure 1: Location of the Site

2.5. Groundwater

The Canterbury Maps GIS system shows that most of the site is over the Unconfined/semi-confined Groundwater Aquifer system.

Pattle Delamore & Partners (PDP) have been engaged by CGL to carry out a groundwater assessment as part of this application. The PDP report notes that "*An ECan groundwater level monitoring bore (M35/1111) which is 21.4 m deep is located approximately 400 m south of the site and has 462 groundwater level records from 1974 to 2024. The frequency of measurements varies across the monitoring record with one or two measurements per year taken between 1974 and 1987, increasing to mostly monthly frequency from 1989 onward. The measurements show that depth to groundwater varies between approximately 12.3 to 18.6 m bgl, with a seasonal pattern of generally higher water levels in winter and early spring and lower water levels in summer and early autumn. Typically, seasonally low groundwater*

levels have remained within the average range of around 16 to 18 m bgl with shallower groundwater level spikes to around 12 to 15 m bgl typically observed in the winter months."[1]

3. Description of the Site's Soils

3.1. Soil Types and Textures

Canterbury Maps and S-Maps[2] provide details of the soils under the Site. The main soil types and their properties are presented in Table 1.

Table 1: Soil Types and Area Under Each Soil Type

Soil Name	Sibling	Soil Texture	Depth (cm)	Permeability	Area (ha)	Proportion
Waimakariri	Waim_40c.2	Silt Loam	45-100	Moderate over rapid	17	31.40%
Selwyn	Selw_39a.1	Loam	>100	Moderate	15	26.40%
Waimakariri	Waim_2a.1	Silt Loam	45-100	Moderate over rapid	9	15.60%
Waimakariri	Waim_42a.1	Loam	>100	Moderate over rapid	6	10.90%
Waimakariri	Waim_4b.1	Loam	45-100	Moderate over rapid	4	7.50%
Selwyn	Selw_25a.1	Loam	45-100	Moderate over rapid	3	5.60%
Selwyn	Selw_3a.1	Loam	>100	Moderate over rapid	1	1.00%
Waimakariri	Waim_1b.1	Silty loam	>100	Moderate	< 1	0.70%
Selwyn	Selw_26a.1	Silt loam	>100	Moderate over rapid	< 1	0.40%
Fereday	Fere_3a.1	Sandloam	>100	Rapid	< 1	0.20%
Rakaia	Raka_4a.1	Silty loam	20-45	Moderate over rapid	< 1	0.20%
Total					55	100%

Table 2 summarises the drainage properties of the proposed site and the areas under each drainage class.

Table 2: Drainage Properties of the Soils

Drainage Description	Area (ha)	Percentage (%)
Well Drained	55	100%
Total Area	55	100

3.2. Geotechnical Report

The soil properties described above are consistent with those in the geotechnical investigations by Tetra Tech Coffey[3].

4. Land Use Capability (LUC) and Quantifying LUC Classes with the Site

4.1. Land Use Capability

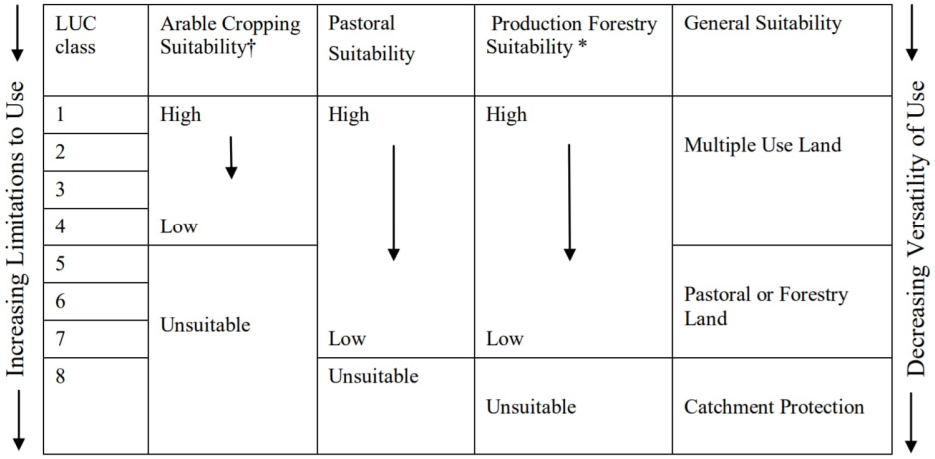
The LUC described by Lynn et al. (2009)[4] is a general purpose, qualitative evaluation system which has been widely applied in New Zealand for planning land use, especially for management and conservation.

LUC classification system defines eight LUC classes of soil "*according to its long-term capability to sustain one or more productive uses based on physical limitations and site-specific management needs"*[7]. Classes 1–4 are classified as arable land, while LUC Classes 5–8 are

[1] *Pattle Delamore & Partners Limited. 2025. Memo - Groundwater Assessment to Support Consent Application for Stormwater Discharge at 104 Ryans Road, Yaldhurst.*
[2] *https://smap.landcareresearch.co.nz/maps-and-tools/app*
[3] *Tetra Tech. 2024. Geotechnical Assessment Report. Ryans Road Fast Track. Carter Group Limited*
[4] *Lynn IH, Manderson AK, Page MJ, Harmsworth GR, Eyles GO, Douglas GB, Mackay AD, Newsome PJF 2009. Land Use Capability survey handbook: a New Zealand handbook for the classification of land, 3 rd ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, GNS Science. 163 p.*

non-arable. Versatile soils are generally defined as Class 1, 2, or 3 soils as delineated by the New Zealand Land Resource Inventory (New Zealand Soil Bureau amended 1986).

Figure 2 shows the potential land uses and the relationship between the versatility and LUC classes.



LUC class	Arable Cropping Suitability†	Pastoral Suitability	Production Forestry Suitability *	General Suitability
1	High	High	High	Multiple Use Land
2	↓	↓	↓	
3				
4	Low			
5	Unsuitable			Pastoral or Forestry Land
6				
7		Low	Low	
8		Unsuitable	Unsuitable	Catchment Protection

Figure 2: Relationship between the Versatility and LUC Classes (Lynn et al, 2009[5])

4.2. LUC Classes of the Soils within the Site

The LUC Classes of the soils within the site are mapped on Canterbury Maps[6], and the Landcare Research portal[7]. Figure 3 shows the locations and areas of the LUC Classes in and around the site. The soils within the proposed site are classified LUC Class 2.

Figure 3: LUC Classes of the Land Within the Proposed Site

[5] http://envirolink.govt.nz/assets/Envirolink/83-mldc7-MarlboroughSoilsAdvice.pdf
[6] https://mapviewer.canterburymaps.govt.nz
[7] https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Land%20Capability/lri_luc_main

Table 3 below provides a summary of the LUC Classification for the site.

Table 3: – Gross Default LUC Classes within the Site

LUC Class	Gross Area (ha)	%age
LUC 2	55	100%
Total	55	100%

5. National Policy Statement for Highly Productive Soils (NPS-HPL)

5.1. Introduction

The NPS-HPL came into effect on Monday 17 October 2022. The NPS-HPL seeks to protect highly productive land 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 highly productive land at a regional level, and imposes varying levels of constraint on the rezoning, subdivision, land use and development of that land.

5.2. Highly Productive Land

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 "highly productive land" contained in clause 3.5(7).[9] The two inclusionary criteria for that definition are that the site is:

i. zoned general rural or rural production; and
ii. LUC 1, 2 and 3 land.

"LUC 1, 2 and 3 land" is defined in the NPS-HPL as land identified as 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. The Site is LUC Class 2.

As the site is LUC Class 2, the Site meets criteria (i) and (ii) and appears to meet the definition of "*highly productive land*" in clause 3.5(7)(a).

We understand that there is a valid argument that the Site's current Rural Urban Fringe zoning may not constitute a 'general rural' or 'rural production' zone under the National Planning Standards. It is therefore possible that the Site may not be "highly productive land" under the transitory definition of the NPS-HPL. Nevertheless, this report has been prepared on the (conservative) basis that the current Rural Urban Fringe zoning does constitute a 'general rural' or 'rural production' zone and that the Site therefore meets the transitional definition of "highly productive land" under clause 3.5(7) of the NPS-HPL.

For completeness, the exclusions to the transitional definition of "highly productive land" contained in clause 3.5(7)(b) are not relevant to the Site.

We also note that the Regional Council has produced draft maps of its highly productive land in the region for the purposes of the NPS-HPL as part of its Draft Canterbury Regional Policy Statement 2024. This mapping did not identify the site as "highly productive land". While the transitional definition of "highly productive land" continues to apply until any such mapping is operative, and noting that the Regional Council has placed the development of its new Regional Policy Statement on hold until January 2026, it does indicate that this land may not be "highly productive land" under the NPS-HPL in the future.

5.3. The Relevant Provisions

As noted in Section 1, CGL are seeking a land use and subdivision consent for an industrial development. Therefore, the relevant NPS-HPL provisions for consideration are:

[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).*

- Objective, Policy 7, Policy 8, and Policy 9
- Clause 3.8
- Clause 3.9
- Clause 3.10

To inform an assessment of the proposal against these provisions of the NPS-HPL, our report considers:

- Site specific constraints affecting the productive potential (and therefore viability of land-based primary production) of the Site (Section 6).
- The potential cumulative loss of availability and productive capacity of highly productive land (Section 7).
- The potential reverse sensitivity effects of the development on other surrounding land-based primary production (Section 8).
- The potential for fragmentation of large geographically cohesive areas of highly productive land (Section 9).

6. Site Specific Factors Affecting the Agricultural Productive Potential of the Site

6.1. Introduction

Clause 3.10(1)(a) requires that territorial authorities may only allow highly productive land to be subdivided, used, or developed for activities not otherwise enabled under clauses 3.7, 3.8, or 3.9 if satisfied that there are permanent or long-term constraints on the land that mean the use of the highly productive land for land-based primary production is not able to be economically viable for at least 30 years.

This section looks at site-specific factors to demonstrate the site's productive capacity.

"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".

Similar guidance has previously been given by the Environment Court[10] on factors which indicate productive capacity (illustrated in Table 4 below).

Table 4: List of Factors Determined by Environment Court as Indicating Productive Capacity

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	Transport, both ease and distance
Availability of irrigation water	Shelter planted	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		

Based on Reeftide's desktop analysis, a number of these factors are present within the site, and it is considered that they significantly constrain the ability to undertake land-based primary production at the site. These factors are discussed in more detail below.

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

6.2. Effects of Soil Moisture and Irrigation Water Availability

6.2.1. Moisture Deficits

Christchurch climate can be very hot and dry during spring and summer at a time when most agricultural production needs moisture the most. These weather conditions significantly affect crop production and ultimately compromises the soil's natural capital or productive potential as it will not matter how inherently fertile or productive the soils are as moisture or irrigation is critical to support crop growth.

6.2.2. Irrigation Requirements

Table 5 summarises the monthly irrigation application depths based on long term climatic data and IrriCal[11]. IrriCalc is a tool, approved in the Canterbury Land and Water Regional Plan (CLWRP), for calculating irrigation water demand. It estimates the irrigation requirements in 9 out of 10 years for pasture, assuming an irrigation system with an 80% efficiency.

Table 5: Irrigation Requirements for Pasture on the Site (mm)

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average	135	99	52	20	3	0	0	0	6	61	76	135
90%tile	189	126	126	63	0	0	0	0	6	126	126	189

Table 5 shows that 135-189 mm of irrigation is required in December and January to maintain a good pasture system. The water demands for other crops would be more or less those of a pasture crop depending on their crop factors[12] which ranges from 0.9-1.1 for most crops.

IrriCal also shows that for the Site, the annual volume of water that would be required to irrigate the 55 ha of the LUC Class 2 is 384,615 m^3.

6.2.3. Availability of Irrigation Water

An interrogation of the Canterbury Maps GIS[13] was carried out to ascertain if there were any irrigation water take consents within the site. Consent CRC144308 permits:

- Taking water from bore M35/3176 at rate of 21 L/s.
- Taking a volume not exceeding 9,504 m^3 in any period of seven consecutive days, and 142,163 m^3 between 1 July and the following 30 June.
- Use of the water for irrigation of crops and pasture for grazing stock, excluding milking dairy cows.

The consented and available annual volume is only 37% of the total volume of water that would be required to irrigate the Site for pasture, as assessed above. This is a shortfall of 242,542 m^3 per year.

6.2.4. Permanency of the Unavailability of Irrigation Water

The site is within the Christchurch West Melton Groundwater Zone. The zone is fully allocated. This means, no more water can be allocated in the zone. In other words, no new consents to take water for irrigation will be granted.

The only other possible option to acquire water for irrigation would be to buy and/or transfer an existing consent to the Site. With regards to the transfer of consents:

- 242,542 m^3 for the 55 ha of LUC 2 would need to be sought to provide the minimum requirements for the site.
- Consents to transfer water are becoming difficult to get. We expect this to worsen with time due to:
    - Climate change induced increases in irrigation water demand.

[11] http://mycatchment.info/
[12] *Crop factor is a crop-specific proportion of evaporated water that needs to be replaced by irrigation.*
[13] https://canterburymaps.govt.nz/

- Increasing shortages in consents available for transfer due to demand for these consents as there are no new consents for irrigation purposes granted within the zone.

If the consent to transfer were to be found, the cost of purchase is on average $\$1.20/m^3$ of water, and this means the 242,542 m^3 would cost almost $300,000. On top of this would be the cost of consenting, the capital costs for new wells, the irrigation infrastructure etc. These costs make many productive activities uneconomic for the Site.

We therefore conclude that:

- Without sufficient irrigation, the LUC 2 soil within the site will never achieve its full productive potential.
- On this basis the 55 ha of LUC 2 land has a permanent and long-term constraint which compromises the productive potential and economic viability of the highly productive soils because of the limited available water supply. This is evidenced by the current low productivity across the site.

6.3. Effects of Regional Statutory Considerations on Land Productivity

6.3.1. Introduction

The Site is within the Christchurch West Melton Nutrient Allocation Zone which is Red. A red nutrient allocation zone under the CLWRP is a farming area with limits on the amount of nitrate and phosphate that can be leached into the soil. There is no flexibility to leach beyond the nitrogen baseline. Baseline nutrient budgets are nitrogen budgets established based on the farming activities during the period 2009-2013. These budgets show the degree (in kg of nitrogen per ha) of nitrogen leaching on a site under the site-specific farming practices.

In fact, the CLWRP seeks to manage and require reductions in diffuse discharges of nitrogen, phosphorus, sediment and microbial pathogens from land use activities including commercial vegetable production through rules. For example:

- Policies 4.34-4.36 which relate to management of nutrient loss from farming among other activities.
- Policies 4.37 to 4.38H which apply to individual farming activities, nutrient user groups and farming enterprises.
- Policy 4.41C which seeks to maintain water quality in Orange, Green and Light Blue Nutrient Allocation Zones, and improve water quality in Red Nutrient Allocation Zones and Lake Zones by requiring the implementation of good practices and demonstration of methods to manage and reduce nutrient discharges.

The Site's productivity has historically been low or in other words the farming activities have been of low intensity which means the extent of nitrogen leaching has also been low. Therefore, the baseline nitrogen leaching rates are also very low.

6.3.2. Permanency of the Nutrient Limit Constraints

Future nitrogen leaching rates are required to not exceed the baseline rates and where they do these need to be reduced. We consider the nutrient limits to be a long-term constraint to the productive capacity, particularly in Canterbury, on the following basis:

- The groundwater nutrient concentrations being observed now within the groundwater catchment are primarily from activities of the past several decades – since the 70s, 80s, 90s and early 2000s. The effects of the more recent (1980s to the present day) intensification in dairying and other farming activities will manifest over the next several decades (20, 30, 40 years). The effects will be considerably worse than what the catchment is experiencing now because of this intensification.
- Mitigation measures being implemented in compliance with the CLWRP will unlikely restore the nutrient levels to the pre-intensification levels. For these reasons, it is likely that limits on nutrient use will be a permanent constraint.

- It is also not unreasonable to expect further policies and regional rules to be tightened to reduce the use of nutrients.

Therefore, nutrient limiting policies and rules are a permanent and long-term constraint which compromises the productive potential and economic viability of the highly productive soils of the Site.

6.3.3. Impacts of Nitrogen Limits on Productivity and Farm Economics

Any reductions in nitrogen fertilisers or limited use is accompanied by a decrease in yields, revenues and profitability. There is literature that supports this. A few examples of such literature are:

- 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[14] concluded that loss in productivity could result in revenue reductions of up to 41% with an average of 14% across the farming systems studied.
- Reports prepared by the Agribusiness Group (2014)[15,16] on behalf of Ministry for Primary Industry found significant reductions in yield and profitability resulting from nutrient reductions.

The Agribusiness reports also include budgets showing losses for some crops with the conclusion that "*At the 10% reduction in the amount of N 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*".

Therefore, any natural capital that the 55 ha of urban fringe LUC Class 2 soils on the site is negated by the statutory constraints relating to nutrient application imposed by the statutory planning rules.

7. Scale of the Proposal and Potential Reduction in HPL

Clause 3.10(1)(b)(i) requires that Territorial authorities may only allow highly productive land to be subdivided, used, or developed for activities not otherwise enabled under clauses 3.7, 3.8, or 3.9 if satisfied that the subdivision, use, or development avoids any significant loss (either individually or cumulatively) of productive capacity of highly productive land in the district.

The estimated quantities of LUC Classes 1-3 based on information from various sources is summarised below:

- Canterbury Region has 293,700[17] ha of Class 1 and 2 soils and 543,000 ha[17] of LUC Class 3 soils giving a total of 836,700 ha of Classes 1, 2 and 3 soils.
- Christchurch District has 9,330 ha of LUC Classes 1-3 (710 ha LUC Class 1 and 5,061 LUC Class 2 and 3,559 ha of LUC Class 3 soils). These figures were derived from the LUC classification layer on Canterbury Maps for the areas zoned Rural Banks Peninsula, Rural Port Hills, Rural Urban Fringe and Rural Waimakariri.

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[14] *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

[15] *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.

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

[17] https://www.tandfonline.com/doi/full/10.1080/00288233.2015.1092996

Table 6 below summarises the proportion of site's proportion of highly productive land within the Canterbury Region and Christchurch District under the NPS-HPL.

Table 6: Proportion of the Site's Highly Productive Land Under the NPS-HPL

LU Class	Canterbury Region (ha)	Christchurch District (ha)	Development Area (ha)	Potential Reduction in HPL Due to the Development	
				Canterbury Region	Chch District
LUC1	23,200	710	0	0.01%	0.59%
LUC2	270,500	5,061	55		
LUC3	543,000	3,559	0		
Total	836,700	9,330	55		

Table 6 shows that the potential reduction of highly productive land in the region and the district as a result of the proposed development under the NPS-HPL to be 0.01% and 0.59% respectively. Therefore, the reduction in highly productive land as a result of the proposal would be insignificant.

8. Potential Reverse Sensitivity Effects

Clause 3.10(1)(b)(iii) requires that Territorial authorities may only allow highly productive land to be subdivided, used, or developed for activities not otherwise enabled under clauses 3.7, 3.8, or 3.9 if satisfied that the subdivision, use, or development avoids if possible, or otherwise mitigates, any potential reverse sensitivity effects on surrounding land-based primary production from the subdivision, use, or development.

The use of the Site for industrial activities is not anticipated to have any impact on the surrounding land-based primary production activities. This is because:

1. The land in close proximity to the Site being Rural Urban Fringe Zoned may not constitute a 'general rural' or 'rural production' zone under the National Planning Standards and therefore may not be highly productive land for the purposes of the NPS-HPL, as we discussed in Section 5.2.
2. The Site is separated from other Rural Urban Fringe land by Ryans Road and Grays Road. There is no direct boundary with other potential productive land. This reduces the potential impacts on the productive land.
3. The development will include a 3 m wide planting strip along the Ryans Road and Grays Road boundaries of the Site which further provide a buffer between the development and surrounding Rural Urban Fringe Land.

- Industrial activities are not sensitive activities that typically give rise to reverse sensitivity effects.

4. There are many examples throughout the district of industrial activities establishing alongside rural activities. The colocation of these activities is not incompatible.

We expect the proposal will also enhance primary production as the industrial development may be used for processing and storage and may also be a transport/logistic hub. The development adds to the list of factors identified in Table 4 as enhancing the primary productive activities.

9. Potential Reverse Sensitivity Effects

Clause 3.10(1)(b)(ii) requires that Territorial authorities may only allow highly productive land to be subdivided, used, or developed for activities not otherwise enabled under clauses 3.7, 3.8, or 3.9 if satisfied that the subdivision, use, or development avoids the fragmentation of large and geographically cohesive areas of highly productive land.

Clause 3.4(5)(b) provides that regional councils in mapping their highly productive land, should where possible, identify the boundaries of large and geographically cohesive areas must be

identified by reference to natural boundaries (such as the margins of waterbodies), or legal or non-natural boundaries (such as roads, property boundaries, and fence-lines). The Site is bound by Ryans Road, Grays Road and the airport land as discussed in Section 2.2. With reference to clause 3.4(5)(b), the Site does not part of a large and geographically cohesive block as a result of these natural and legal/non-natural boundaries and the mixture of zoning and existing (non-productive) land uses on surrounding land.

Therefore, the proposed development will not result in the fragmentation of large and geographically cohesive areas of highly productive land.

10. Adverse Impacts on Airport Activities

10.1.1. Introduction

The northern and northwestern boundary of the site abuts the Specific Purpose (Airport) Zone. The northwestern corner of the site is approximately 170 m from the nearest airport runway. Proximity to the airport imposes height restrictions on vegetation and buildings on site and means that bird strike risk must be managed.

10.1.2. Farming Activities and Risk of Bird Strike

Pattle Delamore Partners (PDP) was engaged by CGL to prepare undertake an avifauna assessment[18]. The PDP report identifies several species counted during the avifauna site visit. The report states that:

- *Swamp harriers create a raised bed nest of sticks, grasses and associated vegetation on the ground or situated within crops and tall grass from October to December. Given the site is large and abundant with favourable nesting vegetation it is likely they may breed onsite (although there were no signs of this during the site visit).*
- *CIAL identifies the following species to be high in times of stock, cropping activities and developments: rock pigeons, southern black backed gull, Spur-winged plover, Canada geese, mallard duck, paradise duck, finch species, yellowhammer, starling, sparrow, South Island pied oystercatcher.*
- *Rock pigeons movements around the CIAL airspace are becoming more of a concern especially during agricultural harvest time.*

From the forgoing, the use of the land for farming activities particularly horticulture has the potential to increase bird populations and, if not managed well, increase the risk of birdstrike.

The risks arising from farming activities is magnified under certain agricultural practices which provide nesting or feeding opportunities for birds. Thus, the nature and types of farming activities within the site has to be limited so that the activities do not encourage more bird populations and/or intensive site management both within the farmland and the airport land would be required.

The PDP[18] report also identifies high risk habitats, land activities (current and proposed) and their attractancy. An extract of Table 4 of the PDP report summarising these is appended as Attachment 2 below. The table shows that the risks associated with current activities are higher than those under CGL's proposal (e.g. sealed yard areas/buildings/concreted areas). It is apparent that the bird strike risks are higher under the land based productive system.

10.1.3. Positive Benefits of the Proposal Vs Land Based Activities

The proposed industrial development will be comprised of dry industries warehousing, logistics, light manufacturing and airport related businesses. With proposed rapid soakage stormwater solutions and with waste management practices in place these activities do not encourage bird populations to proliferate to the same extent as farming activities may.

Given the risk to human life arising from bird strike and the fact that similar activities can be undertaken elsewhere within the district or region where there is no or less risk to airport

[18] *Pattle Delamore Partners. 2024. Avifauna Hazard Management. Report Prepared for Submission as Part of the Ryans Road Fast Track Application. Prepared by Lizzie Civil.*

activities, we consider it a positive benefit if the land was availed for the industrial development such as proposed by CGL.

11. Summary and Conclusions

In summary, Reeftide supports CGL's proposal for industrial development of the site in terms of the directions of the NPS-HPL on the basis that:

a. The site is possibly not HPL under the NPS-HPL Clause 3.5(7) as Rural Urban Fringe land may not be classified as rural land. It is therefore possible that the Site may not be "highly productive land" under the transitory definition of the NPS-HPL.
b. There are multiple long-term constraints on the capacity of that site to support primary production activities, including lack of water for irrigation.
c. The risk of bird strike is considerable when the site is used for land-based production particularly horticulture/ cropping. If this land use remains, then primary production will be constrained as intensification encourages bird populations.
d. The reduction in HPL in the Canterbury region and in the district is low and is only 0.01% and 0.59% respectively under the NPS-HPL.

In light of the above assessment, the proposed development of the Site is appropriate and will not compromise the use of highly productive land for land-based primary productions, both now and in the future.

ATTACHMENT 1 – VICTOR MTHAMO'S QUALIFICATION AND EXPERIENCE

Victor report holds:

- A 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 in Victoria, Australia).
- Master of Business Administration (University of Zimbabwe).
- An Advanced Certificate in Overseer Nutrient Management modelling qualification.

Victor is a member of Engineering New Zealand (MEngNZ), a Chartered Professional Engineer (CPEng) and an International Professional Engineer (IntPE). He was a past National Technical Committee Member of (i) Water New Zealand and (ii) New Zealand Land Treatment Collective (NZLTC).

Victor Mthamo's specific experience relevant to this report includes:

- Stormwater planning, catchment hydraulic and hydrological modelling and design.
- Presenting evidence at a regional council hearing on catchment wide modelling that he carried out to assess the effects of flooding in the lower reaches of the Waitaki catchment in South Canterbury.
- Regular engagement by Christchurch City Council (CCC) as a Three Waters Planning Engineer. In this role as a stormwater planning engineer, he reviews stormwater designs and modelling by various engineers from consulting firms. This work requires a good understanding of soils and water movement in soils.
- Designing and implementing 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.
- 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.
- Assessing effects on soils and groundwater associated with onsite and community wastewater discharge systems such as the Wainui Community wastewater discharge consent.
- Assessing actual and potential effects on groundwater and surface water associated with groundwater and surface water takes.
- Providing quarry soils and rehabilitation expert evidence for new quarries and extensions to existing quarries. Examples of these are:
  - The Road Metals Quarry on West Coast Road in Templeton in 2018.
  - Fulton Hogan Roydon Quarry.
  - Fulton Hogan's Miners Road Quarry.
  - Fulton Hogan's Rolleston Quarry Extension.
  - Road Metals' Rolleston Quarry extension.
- More recently, he has been involved with a number of Plan Changes across Canterbury. These include:
  - Plan Change 66 (PC66) in Rolleston.
  - Plan Change 67 (PC67) in West Melton.
  - Plan Change 68 (PC68) in Prebbleton.
  - Plan Change 69 (PC69) in Lincoln.
  - Plan Change 71 (PC71) in Rolleston.
  - Plan Change 74 (PC74) in Rolleston.
  - Plan Change 75 (PC75) in Rolleston.
  - Plan Change 79 (PC79) in Prebbleton.
  - Plan Change 80 (PC80) in Rolleston.
  - Plan Change 81 (PC81) in Rolleston.
  - Plan Change 82 (PC82) in Rolleston.
  - Plan Change 31 (PC31) in Ohoka.

ATTACHMENT 2 – HIGH RISK BIRD HABITATS (EXTRACTED FROM THE PDP REPORT[19])

Table 7: High-risk habitats, Land Activities and their Attractance			
Area	Habitat Type	Attractance	Developed site's potential impact
Grassed areas	Open grassland and rank grass	Seeded grass attracts foraging seed-eating birds such as finch, skylark, starling, common pheasant and yellow hammer. It also attracts scavenging birds like the swamp harrier.	The development of the site reducing the overall grass area, may reduce seed eating bird activity.
Tarmac/concreted areas	Flat areas of footpaths/walkways or roads	Flat open areas attract loafing birds such as South Island pied oystercatcher, gull spp., rock pigeon and skylark.	The removal of grass and the creation of flat concreated areas may increase loafing bird activity but decrease seed eating bird activity.
Drains and trenching	Ponded water, open trenches/drains and mounded earth	Ponded water and open trenches and drains attracts gull spp., waterfowl spp., and pūkeko. Mounded earth attracts gull species.	The creation of drains/ trenches may attract waterfowl species to the site. However, site soils are expected to be fast draining.
Buildings	Flat rooftops and other structures that form perching and nesting areas	Flat perching areas attract species like Southern black backed gull, house sparrow, starling and rock pigeon.	The creation of rooftops may increase bird perching and nesting activity on site but reduce feeding activity from the former grassland. A WHMP can inform ways to mitigate rooftop effects.
Trees	Trees, shrubs, forest blocks (exotic and native), gardens and other ornamental vegetation	Vegetation creates breeding and perching areas for all avifauna.	Post-development planted trees could create roosting and nesting habitat for birds. However, overall tree count appears to be less post-development than pre-development, and planting plans are designed to have low attractance, reducing overall risk.
Open waterbodies	Ponds, streams, creeks, rivers, lakes, oceans and wetlands	Open waterbodies create feeding and loafing areas for waterfowl species, pūkeko, swamp harrier, and common pheasant.	The creation of stormwater basins could attract more waterfowl to the site, when the basins are full. However, they will only fill following a flooding event and infiltration is rapid meaning this will be rare.

19 [19] *Pattle Delamore Partners. 2024. Avifauna Hazard Management. Report Prepared for Submission as Part of the Ryans Road Fast Track Application. Prepared by Lizzie Civil.*