
To Wolfbrook Developments (Pegasus) Limited**C/o TSA Riley
Attention – Callum Adams****FROM Victor Mthamo****DATE 27 July June 2026****FILE 358-2026****VERSION Final****SUBJECT Pegasus West Development Project – Soils
and Land Assessment**

☒ **MemoReport**☐ For Information Only☐ For Your Action

1. Introduction

1.1. The Applicant and Their Proposal

Wolfbrook Developments (Pegasus) Limited (the Applicant or Wolfbrook) are seeking, through the Fast-track Approvals Act (FTAA), resource consent and other necessary approvals to undertake a large-scale residential development, Pegasus West Development, (with a small commercial/community node) at 8 Mapleham Drive, Pegasus, and within the former Pegasus Golf Course. The proposed development is over an area of approximately 77 ha.

The Applicant has engaged Reeftide Environmental & Projects Limited (Reeftide) to carry out a desktop assessment of the effects of the proposal on soils and also consider alternative uses such as farming.

This report has been structured in 3 parts as follows:

- PART A – Introduction, Executive Summary and Site Description (Sections 1- 5).
- PART B – Assessment of the Proposal against the provisions of the NPS-HPL (Sections 6 and 7).
- PART C – Consideration of alternative uses for the site (Sections 8).
- PART D – Assessment of the proposal against the FTAA (Criteria for assessing referral application) and s13(4) (Proposal and Effects) – Section 9.

2. Executive Summary

The Site comprises an approximate 77 ha of LUC Class 2 (63.2 ha) and LUC Class 6 (13.8 ha) soils. The Applicant's proposed (predominantly) residential use has been assessed against the

relevant provisions in the National Policy Statement for Highly Productive Land (NPS-HPL) amended December 2025.

The site is zoned Special Purpose Zone (Pegasus Resort) (SPZ(PR)) in the Partially Operative Waimakariri District Plan. While some provisions of the zone remain subject to appeal, the Waimakariri District Council has determined that the land is not Highly Productive Land (HPL). Under clause 3.5(7) of the National Policy Statement for Highly Productive Land (NPS-HPL), land can only be deemed HPL under the transitional definition if it is zoned General Rural or Rural Production (or an equivalent zone). As the site is not zoned General Rural or Rural Production, it is not considered HPL and the NPS-HPL does not apply.

Under the Operative Waimakariri District Plan, the land is zoned part Mapleham Rural 4B and part Rural Pegasus. Neither of these zones is the nearest equivalent to a General Rural or Rural Production zone. Consequently, the land could not have been deemed HPL under clause 3.5(7) of the NPS-HPL transitional provisions. For completeness I note that WDC has implemented the National Planning Standards and none of the rural-zoned land within the Pegasus–Woodend–Rangiora area was classified as General Rural or Rural Production. Accordingly, none of the rural land in the vicinity of the Site is deemed to be HPL under the NPS-HPL, irrespective of its LUC status.

As part of the brief, Reeftide was asked to consider, from a soils perspective, the viability of alternative rural use of the site if not used for the proposed residential development. To fulfil this scope the following assessments were undertaken:

- The proposed development comprises largely residential development and will result in new housing across the site. Use of the site for residential activities is more consistent with the wider use as there are already houses developed immediately adjoining the site. Using the site for farming activities will have significant adverse effects on existing residents. This is because farming activities are associated with the use of chemicals, fertilisers, dust generation, spraying and spray drift. Use of setbacks will not be effective as there is existing housing immediately adjoining the Site.
- The site is within the red zone Waimakariri Nutrient Allocation Zone (under Canterbury Land and Water Regional Plan).
 - This means the statutory planning rules limit the use of nitrogen fertilisers, which would be required to enhance productivity if the land is used for farming activities.
 - Without the use of fertilisers there will be low yields. Therefore, nutrient limiting policies and rules are a permanent and long-term constraint which compromises the productive potential and economic viability of the soils of the Site.
 - On the other hand, by using the land for residential development, any use of inorganic fertilisers associated with the golf course will cease. The use of fertilisers in residential gardens will still be lower than that across the golf course.

The memo has also considered the proposal with regards to the FTAA (Criteria for assessing referral application), in particular s13(4) (subclause (a) Proposal and (h) Effects). We conclude that the proposed development will have the following positive environmental benefits:

- The proposal has positive groundwater quality benefits as the use of fertilisers will be reduced.
- Farming is associated with adverse climate change effects. It is likely that some of the effects will be reduced as a result of the proposed use of the land.

In summary, use of the land as proposed does not involve any loss in the productive capacity in the district and the region as the soils are not classified HPL. It is also my opinion that the reduced use of fertilisers will have positive environmental benefits compared to the current and alternative uses.

3. Author's Qualification 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 14 years. Further details of Victor's qualifications and experience in undertaking similar work are detailed in **Attachment 1**.

4. Description of the Site

4.1. Site Location

The proposed development area (the "site") is within the former Pegasus Golf Course. This is shown in Figure 1 (shared areas) and Figure 2 (the indicative masterplan).

4.2. Existing Land Use and Zoning

The site is zoned Special Purpose Zone (Pegasus Resort) (SPZ(PR)) under the Partially Operative Waimakariri District Plan (Appeals Version).

The SPZ(PR) is intended "to provide for a high-quality visitor resort centred around the existing 18-hole international championship golf course. The zone provides for hotel and visitor accommodation, existing large residential lots, a spa and hot pool complex, golf education and golf country club facilities and a limited mix of commercial and associated ancillary activities, that support tourism activities associated with the Pegasus Resort"¹.

Figure 3 below shows the SPZ(PR) and its seven activity areas.

¹ <https://waimakariri.isoplan.co.nz/draft/rules/0/286/0/28959/0/253>



Figure 1: Location of the Site

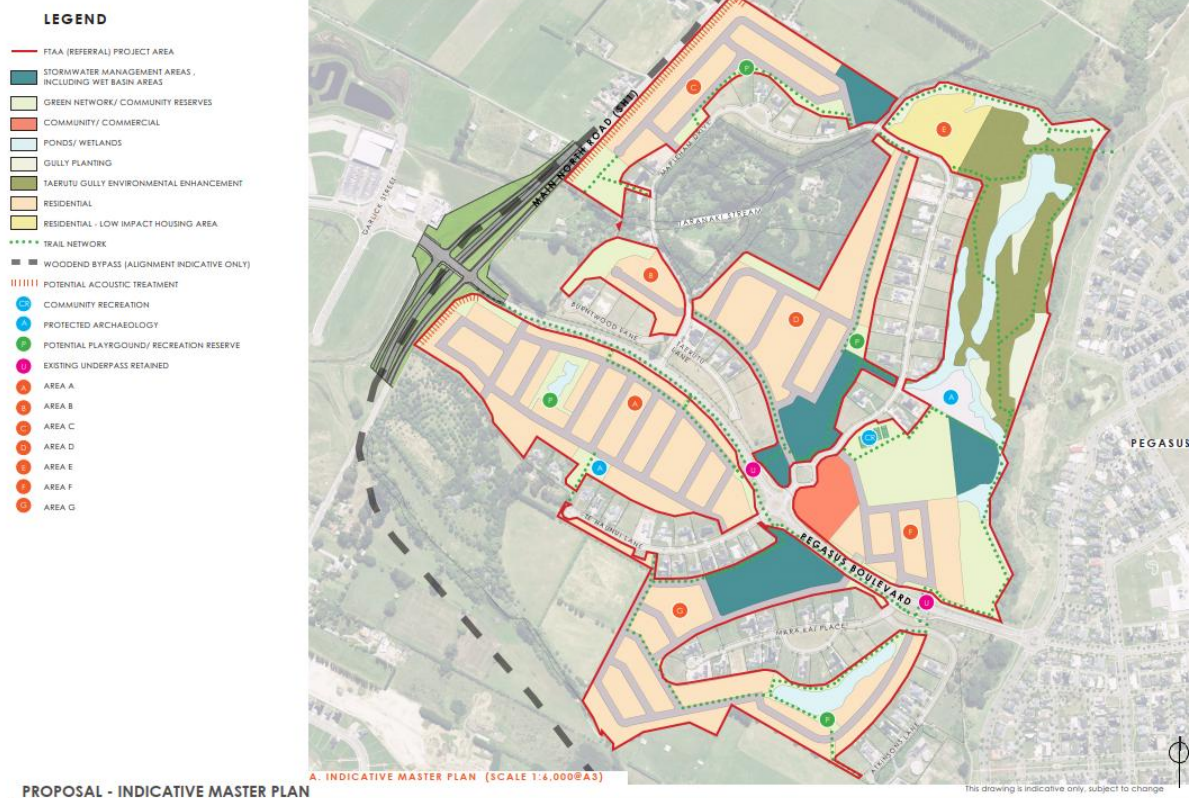


Figure 2: Proposed Indicative Masterplan



Figure 3: Partially Operative Waimakariri District Plan – Outline Development Plan in SPR(PR)-APP1

4.3. Topography

The site has a generally flat topography with some undulations in various parts of the site created as part of the landscaping for the golf course.

4.4. Surface Waterways

There are two main surface waterways near or running through parts of the site. These are the Waihora Stream and Taranaki Stream. The Waihora Stream runs along parts of the southern boundary of the site. The Taranaki Stream crosses the site towards the northern tip of the site. These surface waterways are shown in Figure 4 below.

4.5. Groundwater

The Canterbury Maps GIS system shows that most of the site is over the Coastal Confined Gravel Aquifer System.

There are a number of wells within the site. Most of these wells are geotechnical wells or for well observations and they have since been filled.

There are three irrigation and domestic water bores within the site, and these are listed in Table 1 below. Well M36/0553 shows that the highest groundwater level is 5.63 metres below ground level (mbgl).

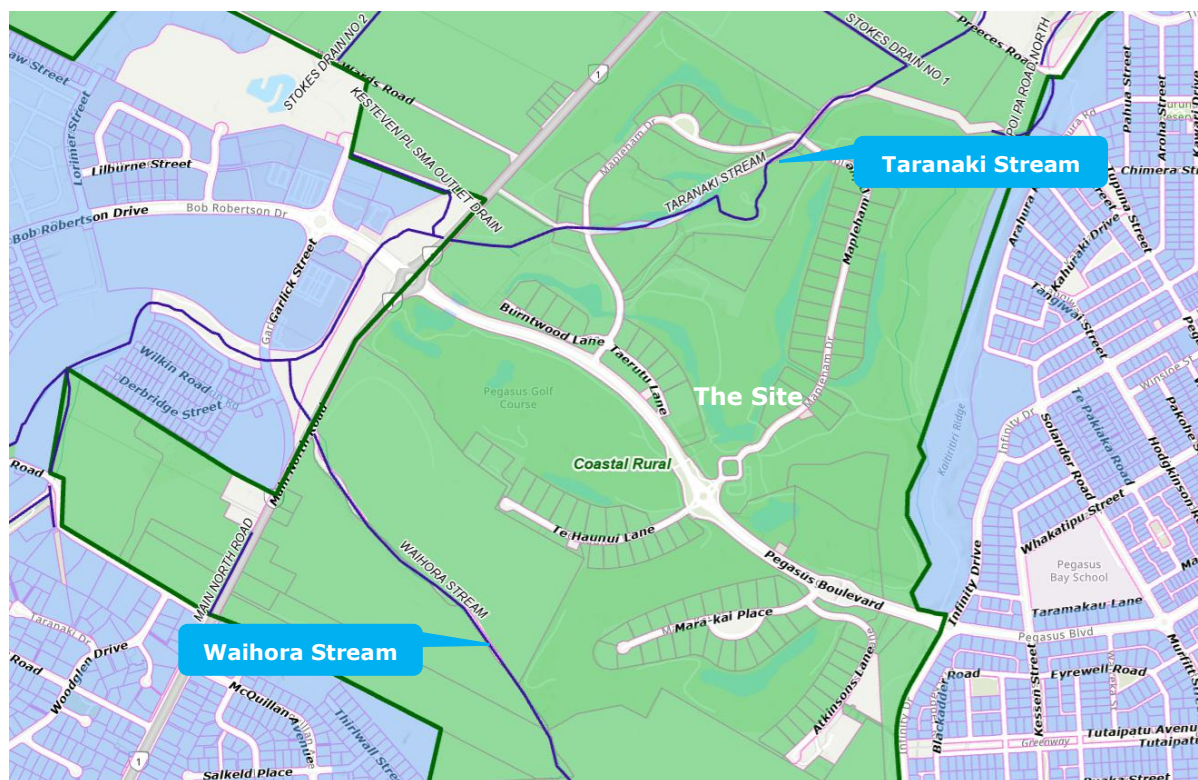


Figure 4: Surface Waterways in and Around the Site

Table 1: Details of the Wells Within the Site

Well No	Address	Use	Depth (m)	Rate of Take (L/s)	Volume (m ³)	HGWL (mbgl)	Consent
M35/7680	Main North Rd	Irr	60	0.54 L/s/ha	2,798 cubic metres per day		CRC181927
M35/0553	S.H.1	DS	8.5			-5.63	
M35/11591	Main North Rd	Irr	25.45	-	-	-	-

DS- Domestic Supply

D&S – Domestic and Stockwater

Irr - Irrigation

NC - Not consented

HGWL – Highest Ground Water Level

5. Description of Soils on the Site

5.1. Soil Types and Textures

Canterbury Maps and S-Maps² provide details of the soils under the Site. The soils and their properties are presented in Table 2.

² <https://smap.landcareresearch.co.nz/maps-and-tools/app>

Table 2: Soil Types and Area Under Each Soil Type

Soil Name	Sibling	Texture	Depth	Drainage	Proportion
Waimakariri	Waim_3b.1	Loam	>1 m	Well Drained	22.80%
Kaiapoi	Kaia_1a.1	Silt	Deep	Imperfectly Drained	17.20%
Templeton	Temp_1a.1	Silt	>1 m	Moderately Well Drained	9.90%
Waimakariri	Waim_4b.1	Silt	45-90 cm	Well Drained	9.50%
Kaipoi	Kaia_2a.1	Silt	45-90 cm	Imperfectly Drained	9.00%
Wakanui	Waka_1a.1	Silt	>1 m	Imperfectly Drained	7.90%
Kaiapoi	Kaia_4a.1	Silty	45-90 cm	Imperfectly Drained	7.10%
Rakaia	Raka_1a.1	Loam	20-45 cm	Well Drained	5.80%
Temuka	Temu_49a.1	Silt over clay	>1 m	Poorly Drained	5.10%
Eyre	Eyre_4a.1	Loam	20-30 cm	Well Drained	2.00%
Waikuku	Wiku_1a.1	Sand	>1 m	Well Drained	1.80%
Wakanui	Waka_5a.1	Silt over clay	>1	Imperfectly Drained	0.60%
Waikuku	Wiku_20b.1	Sand	>1 m	Well Drained	0.50%
Flaxton	Flax_1a.1	Silt	>1m	Poorly Drained	0.40%
Burwood	Burw_1a.1	Sand	>1 m	Imperfectly Drained	0.30%
Rakaia	Raka_2a.1	Loam	20-35	Well Drained	0.20%
Rakaia	Raka_10a.1	Loam	Shallow	Well Drained	0.00%

Table 3 summarises the drainage properties of the Site and the areas under each drainage class.

Table 3: Drainage Properties of the Soils

Drainage Description	Area (ha)	Percentage (%)
Poorly drained	4.5	6%
Imperfectly drained	31.8	41%
Moderately well drained	7.6	10%
Well drained	32.5	42%
Unclassified Land	0.0	0%
Water	0.6	1%
Total Area	≈77	100%

5.2. Summary and Conclusion

It is noted that soil types in Table 2 and Table 3 do not reflect the significant site earthworks and soil modifications that were undertaken as part of the Pegasus/Mapleham development and the development of the golf course.

PART B – ASSESSMENT AGAINST THE NPS-HPL

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

6.1. Land Use Capability

The LUC described by Lynn et al. (2009)³ 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”⁶. Classes 1–4 are classified as arable land, while LUC Classes 5–8 are 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 5 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				
5	Low			Low
6				
7				
8				
	Unsuitable	Unsuitable	Unsuitable	

Figure 5: Relationship between the Versatility and LUC Classes (Lynn et al, 2009⁴)

6.2. LUC Classes of the Soils within the Site

The LUC Classes of the soils within the Site are mapped on Canterbury Maps⁵, and the Landcare Research portal⁶. Figure 6 shows the areas of the LUC Classes in and around the Site, taken from the New Zealand Land Resource Inventory. The soils within the Site are LUC 2 and LUC6.

Table 4 below provides a summary of the LUC Classification for the site.

³ 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.

⁴ <http://envirolink.govt.nz/assets/Envirolink/83-mldc7-MarlboroughSoilsAdvice.pdf>

⁵ <https://mapviewer.canterburymaps.govt.nz>

⁶ https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Land%20Capability/lri_luc_main

Table 4: Gross Default LUC Classes within the Site

LUC Class	Gross Area (ha)	%age
LUC 2	63.17	82%
LUC 6	13.83	18%
Total	77	100%


Figure 6: LUC Classes of the Land Within the Site

7. National Policy Statement for Highly Productive Land (NPS-HPL)

7.1. Introduction

The NPS-HPL came into effect in October 2022 and has been amended a number of times with the most recent amendment occurring in December 2025. The NPS-HPL seeks to protect highly productive land (HPL) for use in land-based primary production, both now and for future generations.⁷ “*Land-based primary production*” is defined as production from agricultural, pastoral, horticultural, or forestry activities that is 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.

7.2. 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-

⁷ National Policy Statement for Highly Productive Land 2022, clause 2.1.

⁸ National Policy Statement for Highly Productive Land 2022, clause 1.3.

HPL, meets the transitional definition of “highly productive land” at clause 3.5(7) of the NPS-HPL. The two inclusionary criteria for that definition are that a 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 comprised of 82% of LUC Class 2 and 18% of LUC Class 6 soils.

However, as the site is not zoned general rural or rural production (Section 4.2) the site does not meet the criteria set out in 3.5(7) of the NPH-HPL. It, therefore, does not meet the definition of “*highly productive land*” in clause 3.5(7)(a).

Therefore, the NPS-HPL is not relevant to the site. No further discussion of the NPS-HPL is undertaken in this report.

PART C – CONSIDERATION OF OTHER LAND USES FOR THE SITE

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

8.1. Introduction

As part of Reeftide’s brief, Wolfbrook has asked us to give thought to the potential use of the land for other uses if not used for the proposed housing development. The main one considered in this report is the use for agriculturally based activities i.e. farming.

8.2. Effects of Farming Activities of Existing Residents

The site has been used as a golf course for at least a decade and a half.

Normal farming activities involve regular cultivation, planting, irrigating, fertilisation, spraying, and harvesting of crops/pasture. Some crops require up to 14 applications for sprays and fungicides per growing season. When carried out in the vicinity of urban activities, this can generate complaints from neighbours regarding noise, smell, spray and fertiliser applications as a result of off target application (the movement of airborne substances as droplets, vapour, solid particles or dust away from the target area).

The Ministry of Health carried out an investigation into spray drift incidents in New Zealand⁹. The report notes that sensitive areas include “..school buildings, including childhood education centres, residential buildings, amenity areas, water bodies, wetlands and public roads”. All these sensitive areas exist close to the site and we would, therefore, expect the same effects.

Elsewhere (i.e. on other sites/areas) this could be addressed by the adoption of appropriate setback distances. However, on this site it is unlikely that:

- Setback distances would be effective given that (a) the site is narrow (between the State Highway and the main Pegasus Township) and (b) there are dwellings distributed across the area and setback distances would result in only a small and uneconomic area of farming compared to the overall site area.
- It is my opinion that the existing residents are unlikely to be accepting of the effects (described above) arising from the introduction of new farming activities even with increased setback distances as this will affect their normal quality of life.

8.3. Effects of Regional Statutory Considerations on Land Productivity

8.3.1. Introduction

The Site is within the Waimakariri Nutrient Allocation Zone called “red nutrient allocation zone” in the Canterbury Land and Water Regional Plan (CLWRP) under the Waimakariri Subregional Plan (Section 8). This means that outcomes for water quality are not currently being met. For such sites the regional council has put in place strict measures to help ensure that farming activities (i) do not make the catchment worse and (ii) on-property and land use improvements are made to improve the water quality.

The site has been used as a golf course over the years and any change to a farming activity would need to consider the rules relating to nutrient allocation and the required farming consent(s).

8.3.2. Limitations to Use of the Land

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 to 4.36 which relate to management of nutrient loss from farming among other activities. For example:

⁹ Ministry of Health. 2007. *The Investigation and Surveillance of Agrichemical Spraydrift Incidents*. <https://www.health.govt.nz/system/files/documents/publications/investigation-surveillance-agrichemical-spraydrift-inciden....pdf>

- Policy 4.36A relates to vegetable production requirements to achieve certain nutrient requirements.
- Policies 4.37 to 4.38H which apply to individual farming activities, nutrient user groups and farming enterprises.
- Policy 4.38 seeks improved water quality outcomes by:
 - avoiding the granting of any resource consent that will allow nitrogen losses from a farming activity to exceed the Baseline Good Management Practice (GMP) Loss Rate, except where Policy 4.38C applies; and including on any resource consent granted for the use of land for a farming activity, conditions that; limit the nitrogen loss calculation for the farming activity to a rate not exceeding the Baseline GMP Loss Rate;
 - require farming activities to operate at or below the GMP Loss Rate, in any circumstance where that GMP Loss Rate has not been influenced by severe extraordinary events (including but not limited to droughts or floods) and is less than the Baseline GMP Loss Rate; and requiring a Farm Environment Plan as part of any application for resource consent to use land for a farming activity, and requiring that Farm Environment Plan to be prepared in accordance with Schedule 7 of this Plan.
- Rules 5.42CA to 5.42CD which set out the rules for vegetable production on a regional basis.

Under the previous golf course nitrogen application rates ranged from 150-210 kg N/ha/year¹⁰ from 2010. The site's nitrogen baseline (based on the years 2009-2013 as defined in CLWRP) is likely to be low. This has a bearing on any future nitrogen applications and discharges. As fertiliser use is critical for land to achieve its productive potential, the site's ability to grow crops/pasture will be hindered by the nutrient application limits associated with the zone as discussed below. This reduces the benefit of the alternative land use making its use as a residential more beneficial.

8.3.3. Impacts of Nitrogen Limits on Productivity and Farm Economics

Any reductions in nitrogen fertilisers or limited uses are 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 Environment¹¹ concluded that loss in productivity could result in revenue reductions of up to 41% with an average of 14% across the farming systems studied.

¹⁰ Pegasus Golf and Sports Club - Golf Course Maintenance and Environmental Management Plan 31 March 2010

¹¹ 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>

- Reports prepared by the Agribusiness Group (2014)^{12,13} 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”*.

Figure 7 below has been extracted from the Agribusiness Report¹³. It shows the corresponding yield reductions associated with reductions in nitrogen.

Appendix One: Average Estimated Reduction in yield with reduction in applied N.					
Reduction in N	Potato (Summer), Onions, Carrots,	Squash, Broccoli, Lettuce,	Cabbage, Spinach, Cauliflower	Potato (Winter)	Barley
10%	10%	15%	15%	25%	25%
20%	20%	25%	30%	35%	35%
30%	30%	40%	40%	50%	45%

Figure 7: Yield Reductions Due to Reductions in N Applications

Samarasinghe et al (2011)¹⁴ carried out research in 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.

Therefore, any natural capital that the ≈63 ha of LUC Class 2 soils on the site have is negated by the statutory constraints relating to nutrient application imposed by the statutory planning rules. This means the alternative use of the site is not as beneficial as first appears.

¹² 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>.

¹³ The Agribusiness Group (June 2014). Nutrient Performance and Financial Analysis of Horticultural Systems in the Horizons Region. Prepared for MPI.

¹⁴ 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

PART D – FTAA CONSIDERATIONS

9. Environmental Impact

9.1. Current Activities vs Proposed Activities

The site is a former golf course. Until recently, fertilisers were used to help grow the grass. The Pegasus Golf Course and Sports Club environmental management plan from 2010¹⁵ shows that fertilisers were applied at the following rates:

- greens 200kg N/ha/year,
- greens surrounds and aprons 210 kg N/ha/year,
- trees 210 kg N/ha/Semi rough 150 kg N/ha/year,

The proposal for a residential subdivision and supporting activities will not require the application of fertilisers as is the case under the golf course use or conversion to a farming activity where fertiliser applications would be in the order of 200-400 kg N/ha/year. Use of fertilisers might occur on a small scale on residential lawns and gardens, but this will be considerably less than the 150-210 kg N/ha/year¹⁵ applied under the site's use as a golf course or if used for agricultural production.

The proposed development will change the nature and character of the discharges from primarily nitrogen discharges associated with fertilisers and other biological activities. Stormwater will be the main source of discharges. Typical contaminants associated with stormwater are sediment, heavy metals and hydrocarbons. Nutrients (nitrates and phosphorus) and pathogens will also be likely contaminants. However, these will be at levels significantly less than those discharged from the use of fertilisers on the golf course or conversion to farming activities.

Stormwater from the development will be treated via a treatment train that will ensure removal of various contaminants to levels below the limits in Schedule 8 of the CLWRP so that discharges to land will have no more than minor or less than minor effects on the receiving environments.

Comparing the two activities it is clear that the proposal will have positive benefits to the environment.

10. Summary and Conclusions

¹⁵ *Pegasus Golf and Sports Club - Golf Course Maintenance and Environmental Management Plan 31 March 2010*

In summary, from a soils perspective, Reeftide supports Wolfbrook's proposal for residential development of the site. This is because:

- a. The soils are not highly productive under the NPS-HPL.
- b. The proposed development will have the following positive environmental benefits:
 - i. Groundwater quality will improve as the use of inorganic fertilisers will be discontinued and this reduces nitrogen leaching into the soils compared to those discharged under residential uses.
- c. Alternative uses of the site such as farming activities would:
 - i. Be of limited value due to the nutrient allocation limits and therefore, the LUC portion of the site will not be able to achieve its full potential.
 - ii. Have adverse effects on existing residents e.g. the use of sprays and fertiliser applications would unlikely be acceptable to them.

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-Waiiau Rivers Irrigation Feasibility Study and the North Canterbury Lower Waiiau 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.