

Assessment of Economic potential lost from proposed re-zoning of 216.63 Ha of Rural Land to Industrial - Marton

The Rangitikei District Council has commissioned this short resource assessment report to assess the productive value of the land in question. Specifically, RDC wishes to consider the effect of losing productive land and quantify:

- The value loss to the agricultural economy if the landuse is changed
- The impact on future potential high value landuse, and
- The overall impact on GDP and employment of the District and the Region.

Headline Impacts from loss of the Land to Arable cropping

Gross output - \$2.9 million

GDP - \$1.3 million (or 0.25% of District GDP)

Employment – 9.5

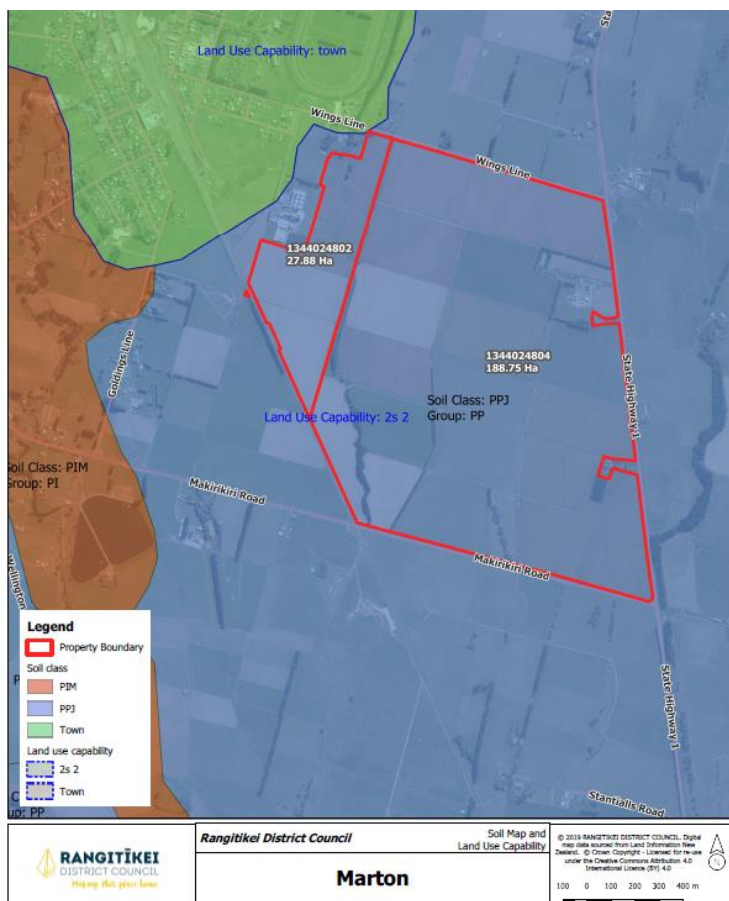
Arable current land-use – 2.8%

Land location (the Land)

South East of Marton urban area – bounded by the Main Trunk Railway, Wings Line (to the North), SH1 (on the East) and Makirikiri Road (to the South).

The land identified to be rezoned industrial is made up of two properties:

- Valuation number 1344024802 – 27.88 Ha
- Valuation number 1344024804 – 188.75 Ha



The Land is zoned Rural, and is adjacent to existing industrial land directly to the West on the edge of Marton. The Land is currently used for arable cropping (largely Maize) and produces quality silage and / or grains generally used to provide winter feed for livestock farming (mostly dairying).

The arable crop industry is a key part of the New Zealand livestock farming supply chain and is a relatively high income producing land-use.

Soil Type

The Land is made up of Pallic soils (Argillic Perch-gley Pallic Soils), and is classed as Land Use Classification (LUC) Class 2. This is defined as:

- Land with slight limitations for arable use and suitable for cultivated crops, pasture or forestry

The LUC classification system classes soils from LUC 1 through to 8, with LUC 1 being 'Land with virtually no limitations for arable use and suitable for cultivated crops, pasture or forestry'. The Land in the proposed zone change is therefore highly productive, but not ideally suited for intensive horticulture.

Detailed soil LUC is:

Soil Class: PPJ = Pallic soils (Argillic Perch-gley Pallic Soils)

Land use capability codes: 2s 2

- **LUC subclass modifier s** = soil physical or chemical properties in the rooting zone such as shallowness, stoniness, low moisture holding capacity, low fertility (which is difficult to correct), salinity, or toxicity first limits production
- **LUC unit identifier 2** = reflects the unique subclass characteristics of this soil type.

Pallic Soils have pale coloured subsoils, due to low contents of iron oxides. The soils have weak structure and high density in subsurface horizons. Pallic Soils are dry in summer and wet in winter. Pallic Soils occur predominantly in the seasonally dry eastern part of the North and South Islands, and in the Manawatu. Parent materials are commonly loess derived from schist or greywacke. They cover 12% of New Zealand¹.

Current areas of land used for Fodder crops

Rangitikei District has a significant area of high quality soils. Some of these soils are currently used for grain and fodder crops like the area in this proposed zone change. The following statistics are from Statistics New Zealand – Agricultural Production Statistics June 2017. This is a census of all farmland. This data reports what is currently the land use. Over time this usually reflects the best productive use from an economic return viewpoint. Maize is part of the Grain, Seed and Fodder Crop category.

Recent land use change across New Zealand into more horticulture and diversified pastoral farming indicates that higher value land use is possible on the most versatile soils. For the purpose of this assessment the current use as Maize and other grain crops (already a reasonably high value land use) is assumed to reflect the productive value of the land.

¹ Soils Portal – Manaaki Whenua Landcare Research

Table 1 – Farmland, Grassland and Grain, Seed and Fodder crop land for Rangitikei and other Territorial Authorities in the Horizons Region.

	Total Farmland (Hectares)	Grassland (Hectares)	Grain, seed and fodder crop land and land prepared for these crops (Hectares)	Grain land as % of total farmland of Area	Grain land as % of Regional Grain land
Rangitikei District	300,418	220,680	7,806	2.6%	33.5%
Manawatu District	189,653	162,178	5,179	2.7%	22.2%
Whanganui District	158,924	111,964	1,901	1.2%	8.1%
Ruapehu District	330,225	209,251	2,788	0.8%	12.0%
Tararua District	352,239	290,637	4,250	1.2%	18.2%
Horizons Region	1,423,619	1,080,633	23,330	1.6%	
New Zealand	13,900,407	7,693,860	490,502	3.5%	

The Rangitikei District has a relatively small but regionally significant area of arable farming with 7,806 Ha of land in grain, seed and fodder crops in June 2017. This land use makes up 2.6% of the Districts' farmland, and 33.5% of this type of land-use in the Horizons Region. In comparison there is just 238 Hectares of horticultural land and land prepared for horticulture in the Rangitikei District.

The Land considered for rezoning makes up 2.8% of this land use in the District, and 0.9% in Horizons Region. It is a very small proportion of the current New Zealand area in Grain land.

Table 2 – Zone change area as proportion of total land used in Grain, Seed and Fodder crops.

June 2017	Hectares	% of Rangitikei District Grain land	% of Horizons Region Grain land	% of New Zealand Grain land
Land area to be rezoned	217	2.8%	0.9%	0.04%
Total Grain, seed and fodder crop land (District Total)	7,806		33.5%	1.6%

Of which:

- Maize grain, silage & green feed (District total) - 1,633 Ha
- Barley and Wheat – 973 Ha

While this is not an exact proportion of this specific soil type, it should give a reasonable indication as land use tends to follow productive soil capability. The Land therefore is around 3% of the arable capable land available in the District.

Foundation for Arable Research (FAR) - Production

FAR is an applied research and information transfer organisation that carries out research and monitors arable production in New Zealand. The following is from their website:

There are over 2,700 farmers in New Zealand involved in arable cropping activities, with combined farm gate sales of approximately NZ \$1Bn, including cereal grains, pulses, maize grain and specialised seed crops for export and domestic markets. Annual crops are grown from the northernmost parts of New Zealand down to Southland, with maize being the dominant crop in the North Island whereas cereal grains (wheat, barley) and seed production (grass seeds, legume seeds and vegetable seeds) is carried out mainly in Canterbury and Southland.

The Arable Industry Marketing Initiative published a fact sheet for the 2018 Maize harvest (as at 1 June 2018)². There is also a Cereal Summary Report for April 2019.

- Average yields of maize grain (12.8 t/ha) and maize silage (20.6 t dry matter (DM)/ha) for the 2018 NZ harvest
- There was in New Zealand
 - 62,400 Ha in Maize, with 21,046 in Maize grain, and 41,392 Ha in Maize silage.
 - Malting Barley was 9,942 Ha in 2019, with a yield of 7.5 t/Ha.

Contribution to the Local Economy

In order to calculate the contribution of the Land in question an average tonnage yield for Maize can be applied to the 217 Ha, and the average price per tonne applied to that resulting tonnage.

- 217 Ha at 12.8 t/ha for Maize grain = 2,777.6 tonnes
- Maize grain, feed Barley and feed Wheat are all at around \$400 tonne (March 2019).
- This gives a gross output of \$1.1 million a year.

This is likely to be the high end as all the land may not be used for Maize, but this reflects its potential is an arable crop unit. There will also be some output from stock grazing between harvesting and sowing the next crop, but this is relatively minor.

Table 3 – Summary of Potential Gross Output for the Land

Land size	Yield	Tonnes per year	\$ / Tonne	Gross Output
217 ha	12.8 t / ha	2,778	400	\$1.1 million

A report by BERL³ for the Arable Food Industry Council in 2016 calculated the gross output, value added (GDP), and employment of the grain sector in New Zealand, as well as the indirect impacts (type 1 multiplier), and total impacts including induced (type 2 multiplier) impacts for each.

The economic theory is as follows:

Type 1 – The direct impact (expenditure or employment), plus the additional impacts from those businesses paying salaries and supplies etc. This secondary expenditure results in the indirect impacts.

Type 2 - The supplying industries pay wages and salaries, which are used to purchase household consumption goods. This effect is generally known as the downstream or induced consumption effect. The total or Type II multiplier is defined as the direct, plus indirect production, plus induced consumption effects, all divided by the direct effect

From these multipliers, and the ratios between gross output and GDP, the economic impact can be calculated for the Land in question. These numbers are from 2015 data and will give an indicative impact assessment.

Table 4 – Economic Multipliers for Arable Production

	Including Indirect Impacts – Type 1 (\$ million)	Including Total Impacts – Type 2 (\$ million)
Gross output	2.12	2.68
Value added – GDP	2.35	3.14
Employment (FTEs)	1.94	2.37

² AIMI - New Zealand survey of maize areas and volumes: June 1, 2018

³ BERL - Economic Impact Assessment of Arable Production in 2015 – August 2016

These multipliers are higher than those for the wider Sheep, beef cattle and grain farming. This reflects the importance of arable crops in downstream uses in the sector. For the Manawatu District as a comparison these are:

- value-added type I multiplier is 1.54 and type II is 1.72
- employment type I multiplier of 1.58 and type II of 1.74.

Note – these figures are for Manawatu District and will differ from Rangitikei District actuals.

The multipliers differ due to the mix of capital and processing involved for the crop. These numbers highlight the important role arable crops play in New Zealand stock farming systems. Some of these crops (malt Barley) are also used in beer production and other food industries.

Table 5 – Impact values for the Land

	Direct Value (\$ million)	Including Indirect Impacts (\$ million)	Including Total Impacts (\$ million)
Gross output	1.1	2.3	2.9
Value added – GDP	0.4	0.9	1.3
Employment (FTEs)	4.0	7.8	9.5

Notes:

1. Value added / GDP is the total of value added to a product in the New Zealand economy, and is derived from the proportion of value added for each \$1 of sales of grains.
2. FTE employment can be made up of a number of part time employment, including contractors. The BERL analysis provided the number of FTEs and total tonnage, from which a ratio of FTE to tonnes can be calculated. This was applied to the 2,778 tonnes from this Land.
3. The indirect impacts will include suppliers and services such as fuel and maintenance on machinery. Total impacts include further spending by employee households on consumption goods.

Removing this Land from Maize or other arable crop production is likely to have a small impact on the Districts farming systems in the medium term. Given continued demand for the crops demand on other suitable land to switch to arable production is probable.

Other Data

The Council has access to the Infometrics Regional Economic Profile dataset for the year ended March 2018. In this data is employment and GDP numbers down to a granular level. This data seems to have some problems as the numbers for grain growing and mixed grain farming for the entire District are very low. This does not match with the Agricultural Production Statistics June 2017 data which is a farm census.

The categories Grain-Sheep and Grain-Beef Cattle Farming and Other Grain Growing have a combined employment count of 36, and a GDP of \$2.6 million. This seems far too low for 7,806 Ha of grain and seed land.

The employment from this Land is a small part of the total employment in Agriculture and Forestry (1,611 employed, excludes agricultural services). Of this sheep and beef farming employed 718 and Dairy farming 319.

Total GDP (value added) for the District in the year to March 2018 from the Infometrics data is \$522.8 million.