

## Land Productivity Report

### RM100848, Adcock and Donaldson.

The application area comprises of 203 hectares of land situated in Rabbit Gully, a tributary of the Stanley Brook. Rabbit Gully is characteristic of the terrain associated with the Moutere Formation. The gully is long and narrow and is dissected by the Stanley Brook which meanders across the valley floor. Approximately 90 hectares of the application area is hill country of which 60 hectares is established in exotic forest, the rest being scrub and pasture. The valley floor consist is of approximately 81 hectares of pasture (with scattered trees and scrub), 13 hectares of exotic forest and 19 hectares of riverbed and berm land.

The soils on the hills have been mapped<sup>1</sup> as Spooner Hill soils. These soils are found on moderately steep to steep slopes. They have a shallow topsoil and subsoil over weathered Moutere Gravels and inherently their fertility is low.

The hill country has a land productivity classification<sup>2</sup> of F indicating that the potential crop range is restricted to extensive pastoral and forestry due to climate, soil type and topographic limitations. The current landuse of this hill country land in the application area highlights the crop range.

The soils on the valley floor have been mapped<sup>1</sup> as Dovedale gravelly loams. These soils are formed on resorted alluvium from the Moutere Gravels. In the application area there are large variations in soil depth and stoniness in the topsoil and subsoil. This variation can occur over very short distances. This is due to the narrow nature of the valley, the influence of outwash from the numerous small side gullies and slopes as well as the alluvial action of the Stanley Brook through the application area. In general these soils are shallow and commonly gravels are present to the surface. As they are derived from resorted alluvium from Moutere Gravels they are inherently infertile. Dovedale soils in the application area have a land productivity classification<sup>2</sup> of C indicating that the potential crop range includes intensive cropping, pastoral and production forestry. Although intensive cropping is possible on parts of the valley floor, the likelihood of it being carried out is low due to the dissected and small nature of the workable areas, the large variability in soil depth, stoniness and also climate limitations. The proximity of large hills bordering both sides of the valley creates shading which reduces the length of the “growing season”. The current land use of the area, which includes pastoral farming and exotic forestry fairly reflect its potential productivity.

The application is to use the area for a large range of recreational activities including the requirements for roads, car parks, campground, accommodation, airstrip and helipad, and other associated buildings. The proposal would require the formation of hard track areas and lakes. The applicant has estimated that impermeable surfaces would cover approximately 5 hectares of land. These are understood to be the areas that would be covered with an asphalt layer. The other tracks proposed would

require the removal of topsoil and some degree of recontouring. These proposed tracks do impact a significant part of the application area. Although the applicant states that a significant amount of the open grassed flats will continue to be grazed it is assessed there will be large areas lost from grazing i.e. those areas used to form tracks, lakes, roads, carparks, and buildings. Whilst it may be possible to rehabilitate some of the track areas if required for pastoral based production in the future, the productivity from much of the track areas would be detrimentally affected in the long term. The effect on production would be less for the reestablishment of an exotic pine plantation on the affected area as there is less reliance on the topsoil for crop growth and any compaction problems associated with track formation could be rectified through “deep ripping”.

The applicant accepts that the proposal cannot “avoid” loss of productive land.

Whilst the objectives of the TRMP require that land suitable for production are protected for that purpose, it also enables opportunities to use rural land for activities other than soil based production, while avoiding the loss of land of high productive value. The land in the application area cannot be described as land of high productive value in context to the Tasman region. It represents a very small part of the region available for pastoral farming and forestry of the type and quality that the application area is suited to.

An issue highlighted in the submission to the application from L F Reitsma and D J McQueen regarding land productivity relates to the effect of dust on crop production. This relates to the use of Olivers Road as the main access road to the application area. This road is unsealed road and situated adjacent to the submitters northern boundary. The submitters have established horticultural crops and forestry on their property. They contest that the use of the road for the proposed activities would negatively affect their horticulture and forestry production.

Internationally there is much evidence to suggest that the dust generation from unsealed roads can have a significant effect on crop production. Generally dust generated from road is not toxic but it does affect crops by reducing plant photosynthesis hence crop yield, increasing crop vulnerability to disease, reducing the effectiveness of disease control and possible downgrading or rejection of the produce.

The level of the effect of dust on crop productivity is related to proximity of the vulnerable crop and the amount of dust generated. To quantify the dust generated from the increase road use as a result of the application is extremely difficult. Dust generation is influenced by a number of factors including the number of vehicles using the road, type of vehicles, speed of vehicles, road maintenance, prevailing wind, silt content of the road surface and rainfall patterns.

The vulnerability of the crop to dust is also dependent on a number of factors including the proximity of the crop to the dust source and the type of crop. For

example some crops, such as kiwifruit and asparagus are more likely to be down graded at the market or processing plant due to dust residue than others such as apples and pumpkin.

With regard to the submitters existing crops of nuts and exotic timber plantation species the main effect of dust generated from the increase use of Olivers Road as a result of the proposed activities would be mainly due to the effect on lowering crop growth rates and yields. Both nuts and timber crops are not known to be susceptible to dust with regard to the effect on quality. However there may be other crops, which are suitable to grow on this land, of which the quality may be more vulnerable to downgrade by dust contamination. This aspect should be taken into consideration as well because if the proposed activity in effect restricts the type of crops that can be successfully grown on the land then it will have will have a detrimental effect on the productive capacity of the land. The productive capacity of land is a measure of both how much crop and the range of crops that can be grown.

It is known that unsealed roads in the Tasman District do generate significant amounts of dust particularly those roads that are situated on the Moutere Gravels. Dust suppression on dirt roads is carried out in the district generally where it affects dwellings or horticultural crops. The applicant's proposal is to increase the volume of traffic using Olivers Road significantly. It is anticipated that if Olivers Road was to remain in its present condition significant amounts of dust would be generated from the proposed use and this would affect land productivity on the Reitsma, McQueen property.

## References

- <sup>1</sup> Soils and Agriculture of the Waimea County New Zealand. Soil Bureau - Bulletin 30
- <sup>2</sup> Classification System For Productive L and in the Tasman District. Agriculture New Zealand

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