
PHILLIPS
AGRIBUSINESS

LAND CAPABILITY ASSESSMENT

24 Churchill Road, Newhaven

Phillip Island

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July 2021

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1.0 INTRODUCTION

The property is 40.1 ha in size and located at 24 Churchill Road, Newhaven. A planning application has been lodged to construct a National Vietnam Veterans Museum on the site. In considering the application, the Bass Coast Council have requested an agricultural assessment on the agricultural quality of the land and its contribution to sustainable agriculture.

The planning report¹ that has been submitted to council notes the following:

- The agricultural quality of the proposed site is Class 3.
- It was proposed to be rezoned to Rural Activity Zone (RAZ) as part of Amendment C140.
- How the proposal meets the Decision Guidelines.
- The west side of the proposed development can be retained for agricultural use or other landscape uses.

To provide an agricultural assessment that meets council requirements, this report addresses the following considerations:

- The agricultural qualities of the land.
- The capacity of the site to sustain the agricultural use.
- Whether there is any loss of agricultural land.
- What impact the development might have on local and regional agriculture.

2.0 AGRICULTURAL QUALITIES OF THE LAND

The natural features of climate, landform, soils and vegetation patterns are the basis for establishing land capability for agriculture. Each is described as follows.

2.1 Climate

Climatic patterns in the district are temperate. Rainfall data from Rhyll indicate an annual average rainfall of approximately 700mm. Mean monthly rainfall is higher during the autumn, winter and spring. The growing season is determined by the commencement of the autumn break, normally April-May. Growth continues through winter but with a cessation in July-August due to low soil temperatures and peaks during the spring months. Growth usually ceases during the summer period (January-March), when there is a rainfall low and evapo-transpiration rates are high.

This type of growing season suits both crop and pasture production but with landform and soil type being major determinates of land use selection.

Table 1: Mean monthly rainfall at Rhyll²

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean rainfall (mm)	35.8	39.4	39.0	57.1	74.8	64.1	69.8	80.3	68.1	58.6	59.6	46.7	694.7

¹ Tract Consultants 23 March 2021

² Bureau of Meteorology data base

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Table 2: Mean monthly maximum and minimum temperature at Rhyll

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean max temp °C	24.0	24.4	22.6	19.6	16.3	14.0	13.4	14.3	16.1	18.0	20.2	22.0	18.7
Mean min temp °C	15.6	16.0	14.7	12.7	10.8	8.9	8.2	8.4	9.5	10.6	12.4	13.9	11.8

2.2 Landform

The landform of the site is gently undulating plain sloping to the east. A complex of catchment dams is centrally located with their catchment area to the south and draining to the north. East of the dams, topography is low lying and poorly drained, forming saline wetlands. The topography rises to the eastern and southern boundaries.

2.3 Soils

The soils within the property include two mapping units³, Merricks and Flinders. The main mapping unit on the higher elevations is Merricks. The soil profile is a light brown fine sandy clay loam topsoil to a depth of 100mm, with a buckshot layer overlying the clay subsoil. The subsoil occurs as a mottled brown medium clay at 300-350mm.

The Flinders soil unit is similar to Merricks except the surface profile is a dark brown silty clay loam with an increasing clay proportion with depth. These soils tend to occur on the lower elevations and are subject to salinisation due to poor drainage conditions.

Nutrient deficiencies for both soils are phosphorous and potassium and likely trace element deficiencies in copper and molybdenum. Soil pH is moderately acid at 5.3-5.5. Soil fertility levels are moderate to low.

2.4 Vegetation

The property is largely cleared of native vegetation with remnants remaining as shelter belts or along access tracks. Tree species include Swamp Paperbark, Drooping She-oak and Swamp Gum. The cleared pasture areas have been sown down to improved pasture species including Perennial Ryegrass and Subterranean Clover but regression to volunteer species such as Yorkshire Fog, Creeping Bent, Couch Grass is extensively occurring. Some native grasses remain including Wallaby Grass and Weeping Grass. The saline areas are distinctive in their location and comprise a coastal saltmarsh with vegetation species including Bearded Glasswort, Common Swamp Wallaby Grass and Native Rushes.

The following series of photos show the different landform characteristics and their vegetative characteristics.

Photo 1 looks due west from a central position. The landform is part of the Merricks mapping unit and the pasture mainly comprising volunteer grass species. Stocking rate capacity is average and estimated at 13-15 dry sheep equivalents⁴ per hectare (dse/ha). The property is not being stocked at present.

³ Soils and landforms identified and mapped by Agriculture Victoria

⁴ Dry sheep equivalent is that amount of dry matter required for one mature wether per annum.

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Photo 1: Western landform



Photo 2 is the central dam. The landform in the foreground forms part of the Merricks mapping unit, is more elevated than the surrounding country and supports a perennial pasture base together with volunteer weed and grass species. Productivity levels are estimated at 13-15 dse/ha.

Photo 2: Central dam



Photo 3 looks south-east and shows the extensiveness of the saline flats with the farm shed in the background. Poor drainage is the primary cause of salting. Stocking rate potential is low and estimated at 5 dse/ha.

Photo 3: Saline flats



Photo 4 is the northern section of the saline flats. Its vegetation class is Coastal Saltmarsh. Conservation rather than rural management is required.

Photo 4: Coastal Saltmarsh



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2.5 Land capability

As described in the preceding section the property is quite variable in its natural features which influences agricultural capability. The main difference is the contour and drainage effect which influences the degree of salinity.

Table 1 is an estimate of area and productivity of the different land classes identified earlier. The points of note are:

- The agricultural productivity of the property is small as indicated by livestock carrying capacity (total dse). This is due to a significant proportion of the property being of low agricultural quality and the remainder being of average quality.
- Agricultural quality of the different land classes is measured on a five class scale, with 1 being the highest and 5 the lowest. Attachment 1 is a generic description of the five different agricultural quality classes which were first developed by the Soil Conservation Authority during the 1960's. The Western flats and boundary rises are of Average land quality (3) while the saline flats and Coastal Saltmarsh are of low to nil land quality.

Table 1: Land utilisation

	Ha	dse/ha	Total dse	Ag Quality
Western flats	17	15	255	3
Farm dam network	3	0	0	0
Saline flats	13	5	65	4
Coastal Saltmarsh	2	0	0	5
Boundary rises	5	15	75	3
Totals	40		395	

2.6 Summary

There is a sharp delineation across the different land classes. Although the soil type characteristics are similar for all of the property, the difference in landform and poor drainage of the lower country has resulted in a significant area of saline flats of low to nil agricultural productivity. These areas are more suited to conservation farming where the emphasis is on maintaining a permanent vegetative base rather than engage in productive agriculture.

3.0 SUSTAINABLE AGRICULTURAL USE

3.1 Existing conditions

The total site area is 40.11ha and lies due north of Phillip Island Road. It forms a rectangular shape that extends from Churchill Road in the west to the flower farm in the east. The immediate neighbouring properties are Phillip Island Airport on the southern boundary, mixed farms on the west and northern boundaries. Land use is both commercial farming and rural living on the properties concerned.

The local catchment drains to the north with its outfall to the Churchill Island Marine National Park and eventually Westernport Bay.

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3.2 Economic characteristics

In the past, the property has been farmed as a commercial grazing enterprise. Current stocking rate estimates indicate that a herd of up to 45 weaner beef cattle or 25 breeding cows could have been supported. The current profitability of beef cattle enterprises, based on survey results⁵ is estimated at a gross margin⁶ of approximately \$32/dse or \$12600 in total where the total stock numbers are approximately 400dse's (see Table 1). This estimate is before the deduction of overheads.

There is limited opportunity to improve on farm performance for the following reasons:

- The productive agricultural land is limited to 22ha with the remainder being either salinity affected or part of water storage (dams).
- The acquisition of additional land to increase farm size is unlikely given that the potentially available areas are to the north and are either rural living properties or land that is salinity affected.

4.0 LOSS OF AGRICULTURAL LAND

4.1 Proposed development

The proposed development is a National Vietnam Veterans Museum which comprises a double storey building located on the eastern section of the property. Access is to be from the roundabout at Phillip Island Road.

The objective is to integrate the development into the surrounding landscape. To achieve this, a landscape design process has been undertaken to meld the physical elements of the landform with the theme of environmental sustainability.

The landscape plan incorporates most of the eastern section of the property including the major water bodies and wetlands. The building development is located on the south-eastern section of the property while the landscape design extends north to include most of the low lying and relatively unproductive agricultural land.

4.2 Loss of agricultural land

The loss of productive agricultural land is estimated at 7ha. This includes all the boundary rises (5ha-see Table 1) and a section of the dam catchment area (2ha) which forms part of the Western flats. The remaining area of the Western flats is 15ha and available to agriculture.

All of the saline flats and Coastal Saltmarsh areas are lost to agriculture. However, agricultural productivity on both these areas is low and management practice is best directed at environmental rehabilitation rather than commercial agriculture. In the landscape plan, this is to occur through establishing Swamp Paperbark Woodland and saline vegetation management areas.

Table 2 shows the anticipated change in the property's land utilisation pattern post development.

⁵ Livestock Farm Monitor Project, Agriculture Victoria 2020

⁶ Gross margin is gross income less direct costs and expressed per hectare or per dse

Table 2: Land utilisation post development

	Farm-ha	Museum-ha
Western flats	15	2
Farm dam network	2	1
Saline flats	0	13
Coastal Saltmarsh	0	2
Boundary rises	0	5
Totals	17	23

5.0 IMPACT ON LOCAL AND REGIONAL AGRICULTURE

Section 3.2 estimated current agricultural productivity levels at a total gross margin of \$12600 per annum. This is a modest contribution to the local economy especially once overheads are deducted.

The gross margin post development is estimated at \$7200, a reduction of \$5400. This loss is due to the reduced land area available and therefore available stocking capacity.

Because of the small values involved, both before and after development, limited impact on the regional economy is anticipated.

6.0 CONCLUSION

The agricultural capability of the property varies according to land class. The Western flats are assessed as “3” or Average, while the Saline flats are assessed as 4 or “Poor” and more suited to conservation farming rather than productive agriculture. Rural productivity is measured according to stocking rate and estimated to be 395 dry sheep equivalents.

The economic performance under beef production is estimated to achieve a gross margin of \$12600 per annum at current productivity levels.

The effect of the development is to reduce the area of land to agriculture. However, the land class lost is largely the saline areas which have low rural productivity and therefore limited impact on farming returns.

The residual land potentially available to agriculture after development is the Western flats, an area of approximately 17ha. It could be farmed in the same manner as before and achieve a total gross margin of \$7200. Because of the small economic values involved, both before and after development, limited impact on the regional economy is anticipated.



Ray Phillips
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9 July 2021

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ATTACHMENT 1: AGRICULTURAL LAND CAPABILITY

Table 1: Agricultural quality classification

Class 1:	Agriculturally versatile land, with high inherent productive potential through possessing deep permeable and fertile soils, a flat to gently undulating land form, and a growing season of 11-12 months either under natural rainfall or through the availability of irrigation.
Class 2:	Agriculturally versatile, but requiring a higher level of inputs to achieve the same productivity as Class 1. Slope is greater, soils more variable, and the growing season is limited to 9-11 months.
Class 3:	Sound grazing land but limited in versatility. Generally unsuited to cropping either because of contour, lack of topsoil depth, or presence of rock. Fertility levels are moderate to low, growing season limited to 8-9 months. With high inputs, high productivity levels may be achieved.
Class 4:	Capable of grazing under moderate to low stocking rates where clearing has occurred. Slopes are moderate to steep, with shallow infertile soils which need care in their management. Fertility levels generally low. Erosion hazard high. Forest is often the best and most stable form of land use.
Class 5:	Land unsuited to agriculture. Constraints may be steepness of slope, shallow, sandy or rock soils, salinity, high erosion susceptibility. Environmental stability may be best achieved through isolating areas and strictly controlling or eliminating agricultural land uses.

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