RMCG

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Wallace - Agricultural Land Capability

Moorabool Shire

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1 Introduction

1.1 BACKGROUND

Moorabool Shire Council is considering preparing a structure plan for Wallace to provide areas for new residential and commercial growth and articulate a growth framework and infrastructure plan for the township.

It is State Policy to protect productive farmland which is of strategic significance in the local or regional context and ensure that the State's agricultural base is protected from the unplanned loss of productive agricultural land due to permanent changes of land use.

Mapping of agricultural land capability in Wallace is therefore required to inform preparation of the structure plan. To enable Council to progress its planning further, it will also be beneficial to understand the potential for land use conflict between agriculture and township uses and the desirability of any buffers to agricultural land. The intention of the structure plan will be to minimise any future land use conflict.

1.2 OBJECTIVES

The objective of the study is to provide land capability and associated relevant information to assist Council in preparation of a future structure plan for Wallace. The assessment is to include identification and consideration of:

- Areas that are likely to have a level of agricultural capability that makes them inappropriate for future residential or commercial development
- Analysis of potential land use conflict, should a structure plan be developed
- Types of agriculture occurring
- Farm size patterns
- Ownership patterns
- Water access and reliability
- Soil type and capability
- Analysis of threats to agriculture (such as residential encroachment) and recommendations on how to deal with threats in structure plan e.g. buffers.

1.3 APPROACH

AGRICULTURAL CAPABILITY

Mapping of productive agricultural land, identifying land with high, medium and low agricultural capability was based on the definition of productive agricultural land in the Planning Practice Note No. 42: Applying the rural zones[1]. Productive agricultural land is defined as having one or more of the following characteristics:

- Suitable soil type
- Suitable climatic conditions
- Suitable agricultural infrastructure, in particular irrigation and drainage systems
- A present pattern of subdivision favourable for sustainable agricultural production.

Data for the assessment was drawn from publicly available sources and Council (Table 1). The analysis framework that was applied to identify land of high, medium or low agricultural capability is set out in Table 2.

Note that the Land Capability Study in the Shire of Bungaree assessed land for its capability to support urban development, small and large farmlets and bush blocks. The capability ratings were adjusted to provide an assessment of agricultural capability.

TABLE 1: AGRICULTURAL CAPABILITY ATTRIBUTES AND DATA SOURCES

ATTRIBUTE	DATA SOURCE
Soil types	Land Capability Study in the Shire of Bungaree (1979)
Climate	Bureau of Meteorology
Suitable agricultural infrastructure	Groundwater irrigation data from Southern Rural Water (http://gwhub.srw.com.au/south-west-region-overview)
Present pattern of subdivision	Lot, property and ownership data from Council

[1] Department of Environment, Land, Water and Planning (2015) Planning Practice Note: Applying the Rural Zones

FIGURE 1: ZONES

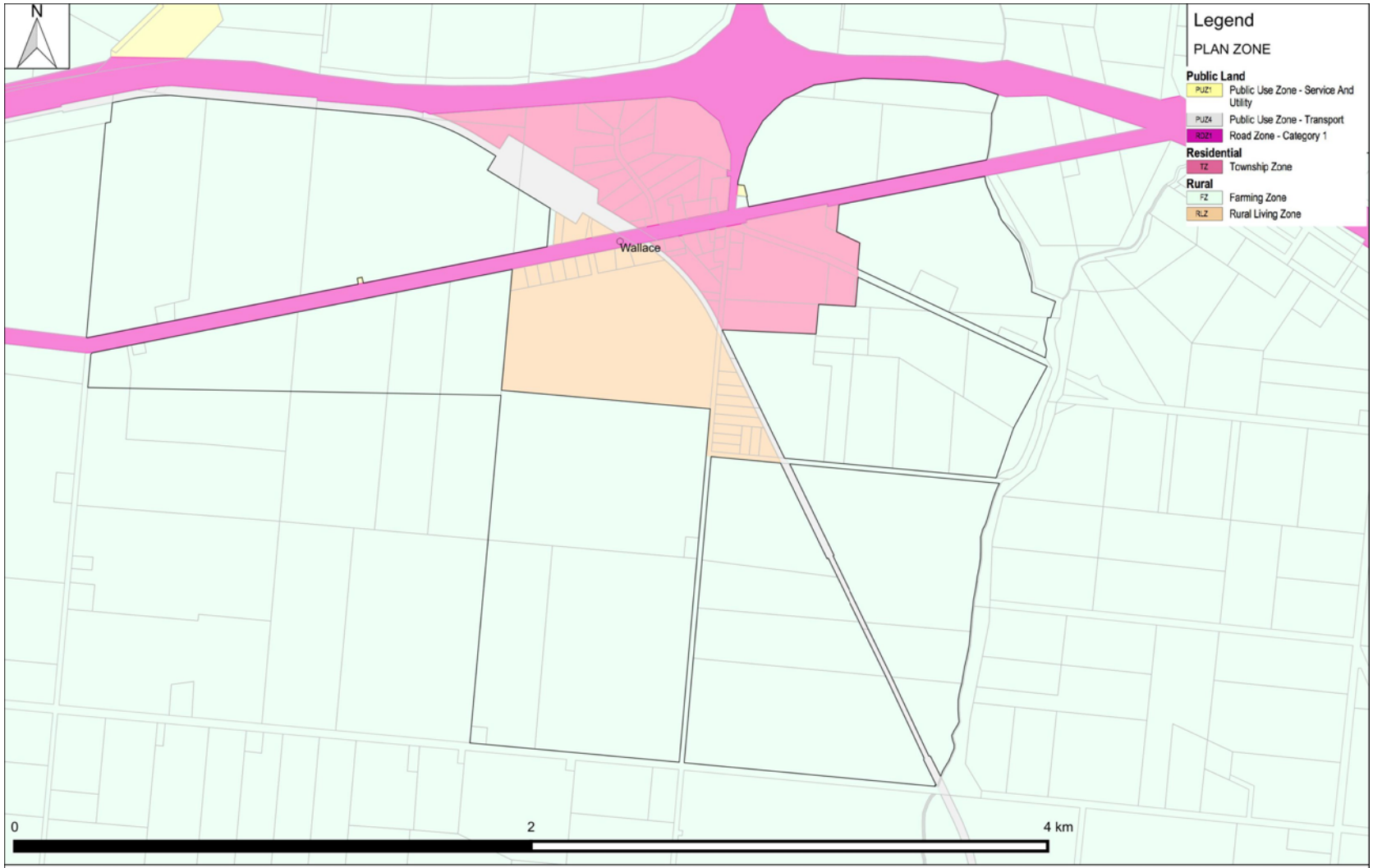


TABLE 2: AGRICULTURAL CAPABILITY ANALYSIS FRAMEWORK

ATTRIBUTES	AGRICULTURAL CAPABILITY CLASS			
		High	Medium	Low
	Soil type	Qbr1	Qbr1	Qya/Qbs
	Access to irrigation	Connected and developed for irrigation	Potential to develop irrigation	No potential to develop irrigation
	Lot size	>10ha	>10ha	<10ha

LAND USE CONFLICT

The land use conflict risk assessment follows the approach detailed in the Land Use Conflict Risk Assessment Guide prepared by the NSW Department of Primary Industry[2]. Land Use Conflict Risk Assessment (LUCRA) is a system to identify and assess the potential for land use conflict to occur between neighbouring land uses. There are four key steps in a LUCRA:

1. Gather information about proposed land use change and associated activities
2. Evaluate the risk level of each activity
3. Identify risk reduction management strategies
4. Record LUCRA results.

The risk is given a ranking between 1 (low risk) and 24 (very high risk) (Table 3) by estimating the probability of a risk occurring and the consequence of the risk occurring A risk ranking greater than 10 is regarded as high.

TABLE 3: RISK RANKING MATRIX

CONSEQUENCE#	PROBABILITY*				
	A	B	C	D	E
1	24	24	22	19	15
2	23	21	18	14	10
3	20	17	13	9	6
4	16	12	8	5	3
5	11	7	4	2	1

* Probability definitions

A	Almost certain	Common or repeating occurrence
B	Likely	Known to occur or 'it has happened'
C	Possible	Could occur or 'I've heard of it happening'
D	Unlikely	Could occur in some circumstances, but not likely to occur
E	Rare	Practically impossible

Consequence definitions

1	Severe	Severe and/or permanent damage to the environment; Irreversible; Sever impact on the community; Neighbours are in prolonged dispute and legal action involved.
2	Major	Serious and/or long-term impact to the environment; Long term management implication; Serious impact on the community; Neighbours are in serious dispute.
3	Moderate	Moderate and/or medium-term impacts to the environment and community; some ongoing management implications; Neighbour dispute occur.
4	Minor	Minor and/or short-term impact to the environment and community; Can be effectively managed as part of normal operations; Infrequent disputes between neighbours.
5	Negligible	Very minor impact to the environment and community; Can be effectively managed as part of normal operations; Neighbour disputes unlikely.

[2] Department of Primary Industry (2011) Land Use Conflict Risk Assessment Guide

2 Description

2.1 OVERVIEW

Wallace is a small township located 20 kilometres from the centre of Ballarat and during the 2016 Census[3] had a population of 187. In addition to a number of dwellings there is a kindergarten, hotel, community hall and oval in the township (Figure 2). There is also a disused butter factory.

Land within the study area is zoned Farming and a number of overlays have been applied to manage design outcomes and provide for realignment of the Western Freeway (Figure 3). Overlays include:

- Design and Development Overlay Schedule 2 - Visual amenity and building design
  - Enhance visual amenity in rural, township and vegetated areas of the Moorabool Shire
  - Encourage the use of external cladding, such as non-reflective materials for building construction
  - Discourage the use of materials, such as reflective cladding for building construction, which could have a detrimental effect on amenity.
- Design and Development Overlay Schedule 4 – Western Highway - Leigh Creek to Woodmans Hill:
  - To ensure the development of land near the future alignment of the Western Freeway between Leigh Creek and Woodmans Hill is undertaken with appropriate noise attenuation measures to minimise the impact of traffic noise on noise sensitive activities.

AGRICULTURAL LAND USE

Agriculture land uses in the study area (Figure 3) includes cropping, such as winter grains, walnut, hay and potato production as well as livestock grazing.

[3] http://www.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC20402 accessed 30/11/2017

FIGURE 2: FACILITIES WITHIN THE STUDY AREA

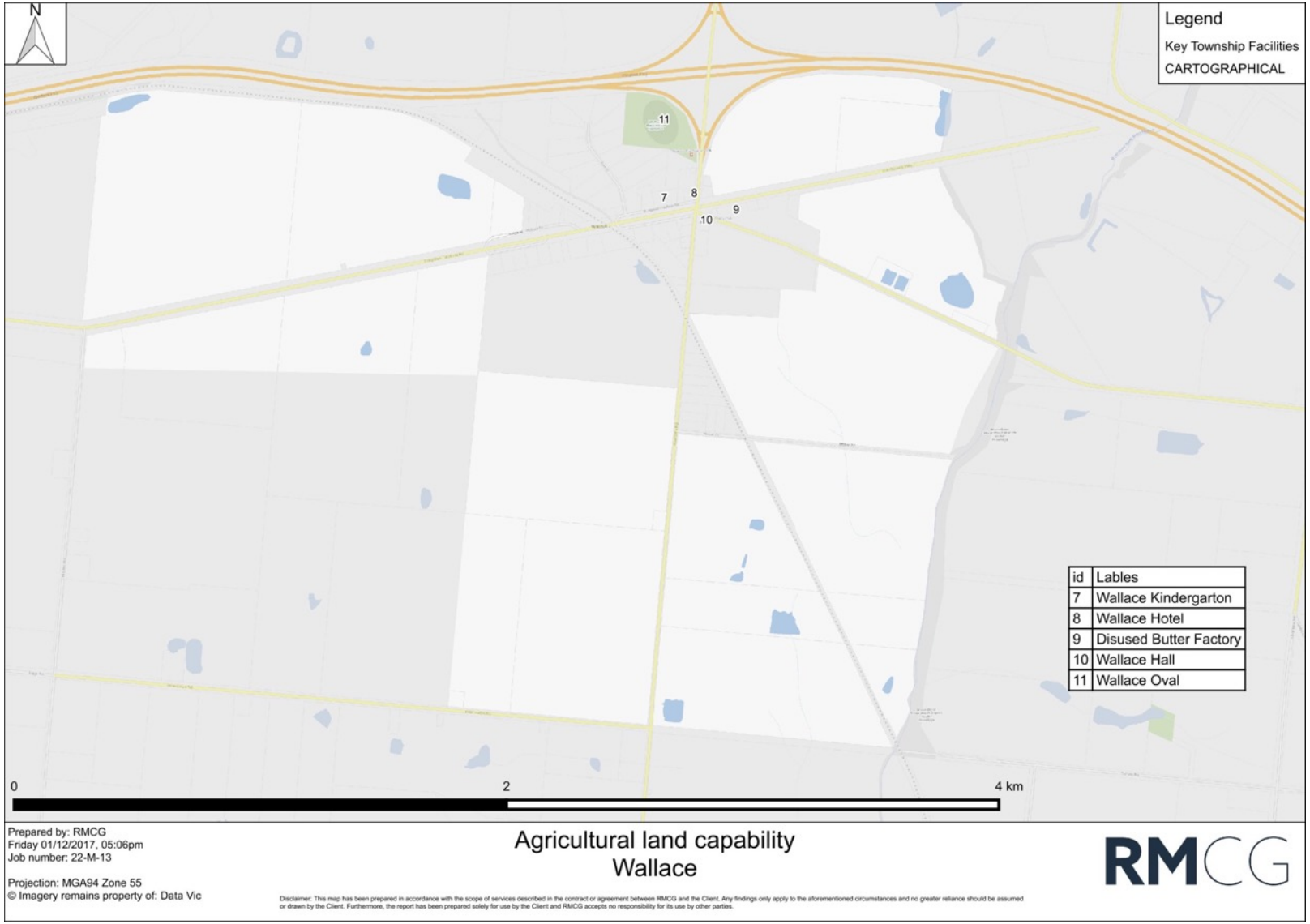


FIGURE 3: OVERLAYS

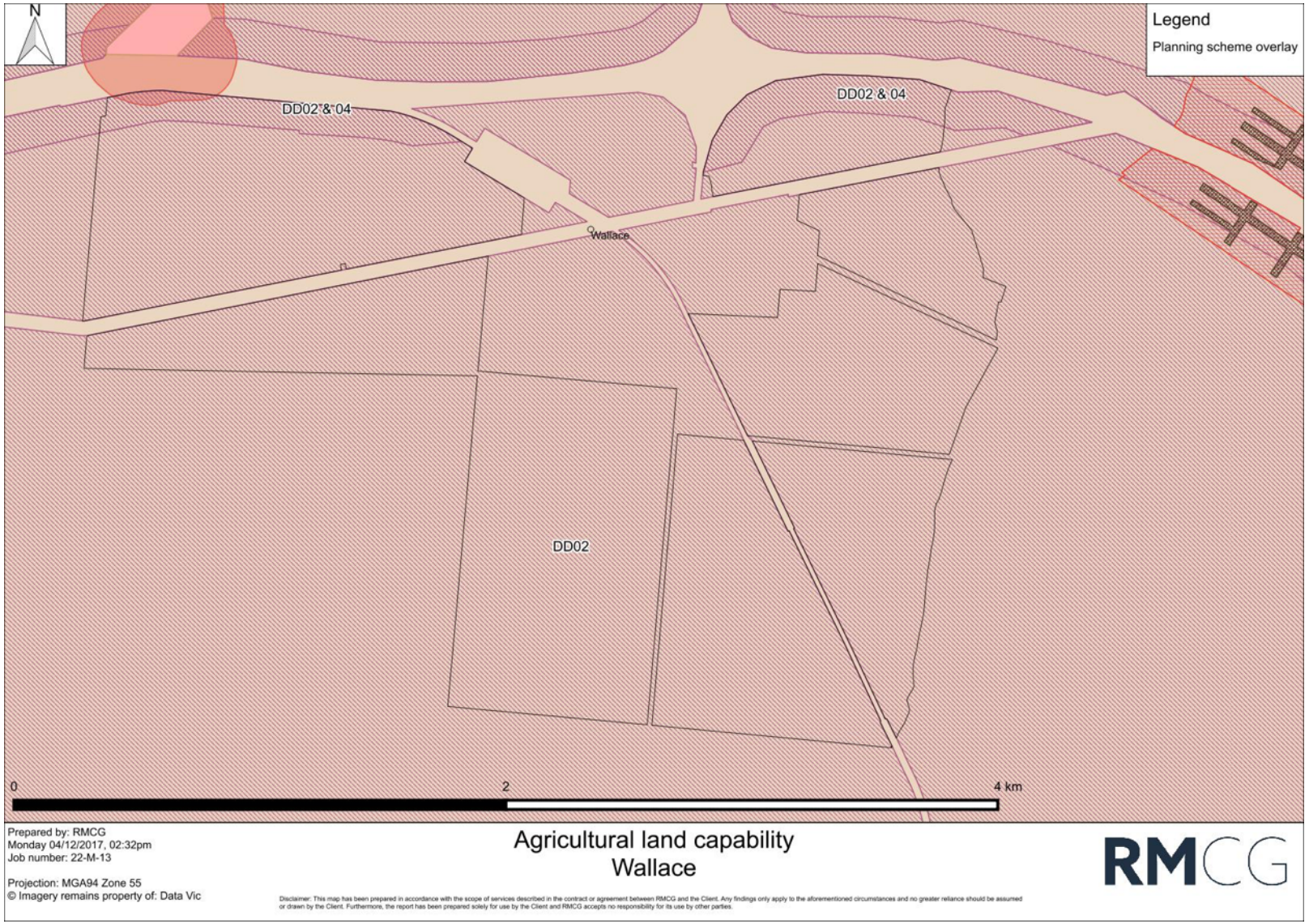
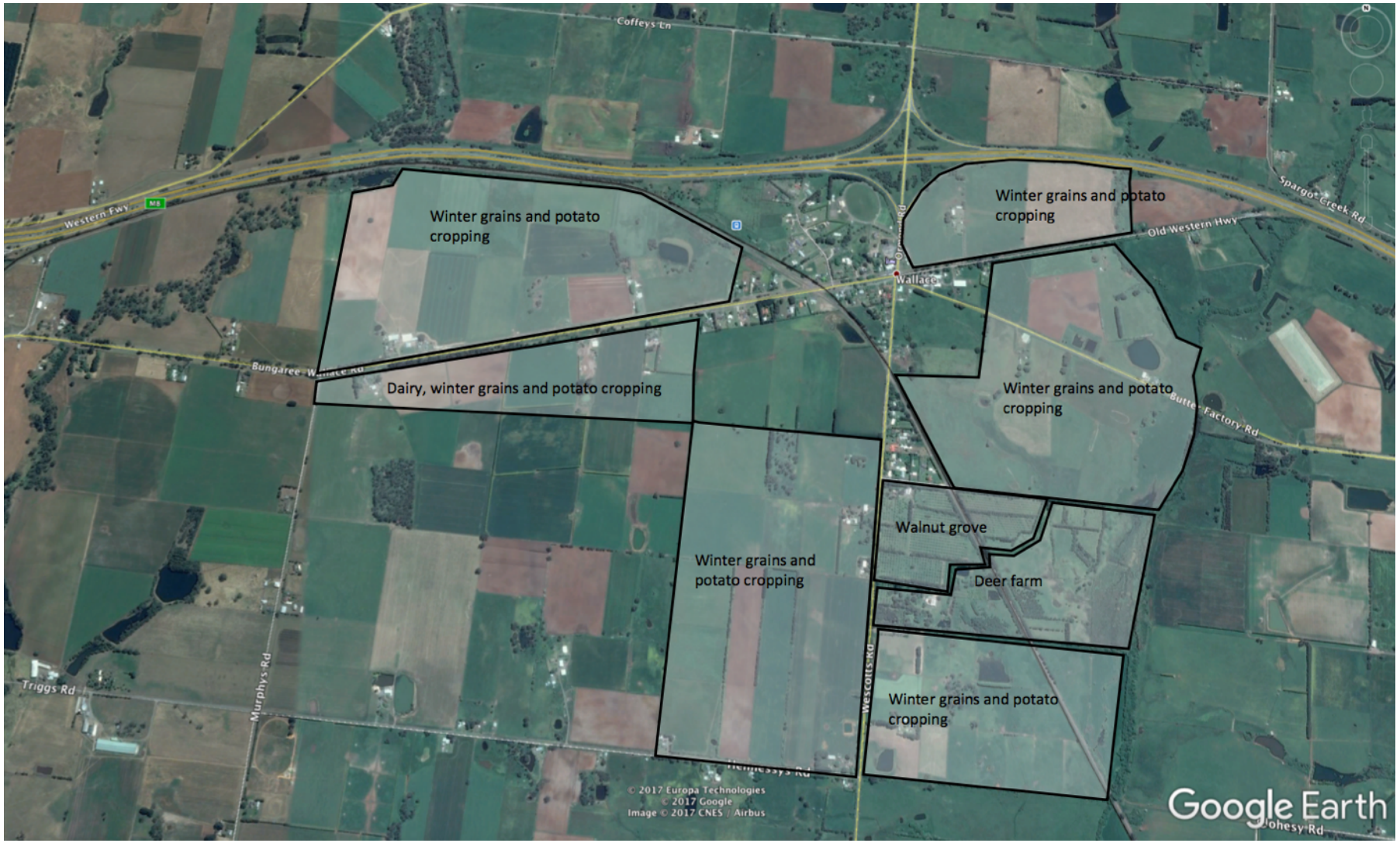


FIGURE 4: AGRICULTURAL LANDUSE



3 Productive agricultural land

3.1 SOILS

There are two main land types in the study area.

Quaternary Basalt Mixtures (Qbm) is found on the plains surrounding the town and consists of dark red gradational soil with a clay to clay loam texture and good permeability. Generally, topsoils are deep, >20cm, and have good nutrient holding capacity. The land capability study classified these soils as good to very good for agriculture and able to support a range of agricultural production including cropping and grazing.

Quaternary Basalt red (Qbr1) are also consists of gradational soils with deep topsoils of (>30cm) clay loam textures and good structure. The land capability study classified these soils as good to very good for agriculture and able to support a range of agricultural production including cropping and grazing.

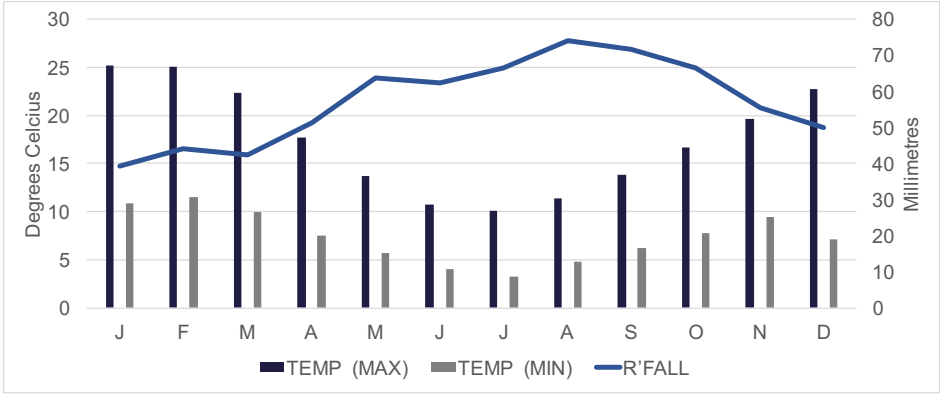
Small inclusions of Quaternary Basalt Boulders (QBs) and Variable Alluvial Soils (Qya) are also recorded within the study area. Quaternary Basalt Boulders are areas of surface boulders with only a 'Fair' capability and suitable mainly for grazing with surface stone the main limitation. Variable Alluvial Soils are of 'Fair to Good' agricultural capability with poor drainage the main limitation.

3.2 CLIMATIC CONDITIONS

Long term climate data (Figure 5) was gathered from the nearest weather station at Ballarat Aerodrome approximately 31km away and based on long-term averages. The mean annual rainfall was recorded as 689.9mm annually with August being the wettest month with 74.1mm of rain and January being the driest with 39.4mm on average. The mean maximum temperate was 17.4°C with January the warmest month with temperatures of 25.2°C. The average low temperatures were recorded as 7.4°C with lows of 3.2°C in July.

Seasonal limitations exist between May-September as Temperatures less than 10°C exist. The study[4] found that Climate was not a factor limiting capability.

FIGURE 5: MEAN MAXIMUM AND MINIMUM TEMPERATURES AND RAINFALL



3.3 AGRICULTURAL INFRASTRUCTURE

The study area falls within the Bungaree Water Supply Protect Area (WSPA). Mapping of groundwater licences (Figure 6) indicates groundwater development for irrigation in and around the study area. Groundwater is used for irrigation of crops and pastures.

Groundwater for irrigation in the study area is sourced mainly from the upper aquifer. These aquifers are generally close to the surface, unconfined and salinity and yield can be highly variable. The upper aquifer in the study area has an estimated yield potential of 5-10l/s and salinity levels less than <500TDS(mg/L) making it suitable for most crops and all stock.

There is potential to access groundwater in the east of the study area from the middle aquifer, however, the salinity levels may be slightly higher, 500-1000 TDS(mg/L) and more suited to salt tolerant crops. For general use, adequate leaching and/or shandying would be required and would not be suited to poorly draining soils.

Groundwater entitlements are fully allocated in the Bungaree WSPA and a licence can only be obtained through trading unused entitlements. There was around 2,000ML of

[4] Soil Conservation Authority: A study of Land Capability in the Shire of Bungaree (1979)

unused entitlement in 2013/14 indicating that there is potential for further irrigation development[5].

3.4 PATTERN OF SUBDIVISION

There are 42 lots within the study area ranging in size from less than 1.0ha up to 47ha. This is consistent with the lot size pattern of the surrounding area. With most lots between 10ha and 40ha.

The 35 lots are held by 10 separate owners (Figure 7). Most lots are part of larger multi-lot tenements that include land outside the study area.

3.5 AGRICULTURAL CAPABILITY

Applying the analysis framework to land within the study area, a map of agricultural capability was prepared (Figure 9). Over 90% of the land is of high quality agricultural land. This land is highly versatile and suitable for a wide variety of agricultural uses. It has access to water for irrigation and a pattern of subdivision and ownership suited to productive agriculture.

Areas north east of Wallace were identified as being of medium agricultural capability. The main limitation to agriculture in this area is the pattern of subdivision.

[5] http://gwhub.srw.com.au/groundwater-use-south-west accessed 30.11.2017

FIGURE 6: GROUNDWATER LICENCES

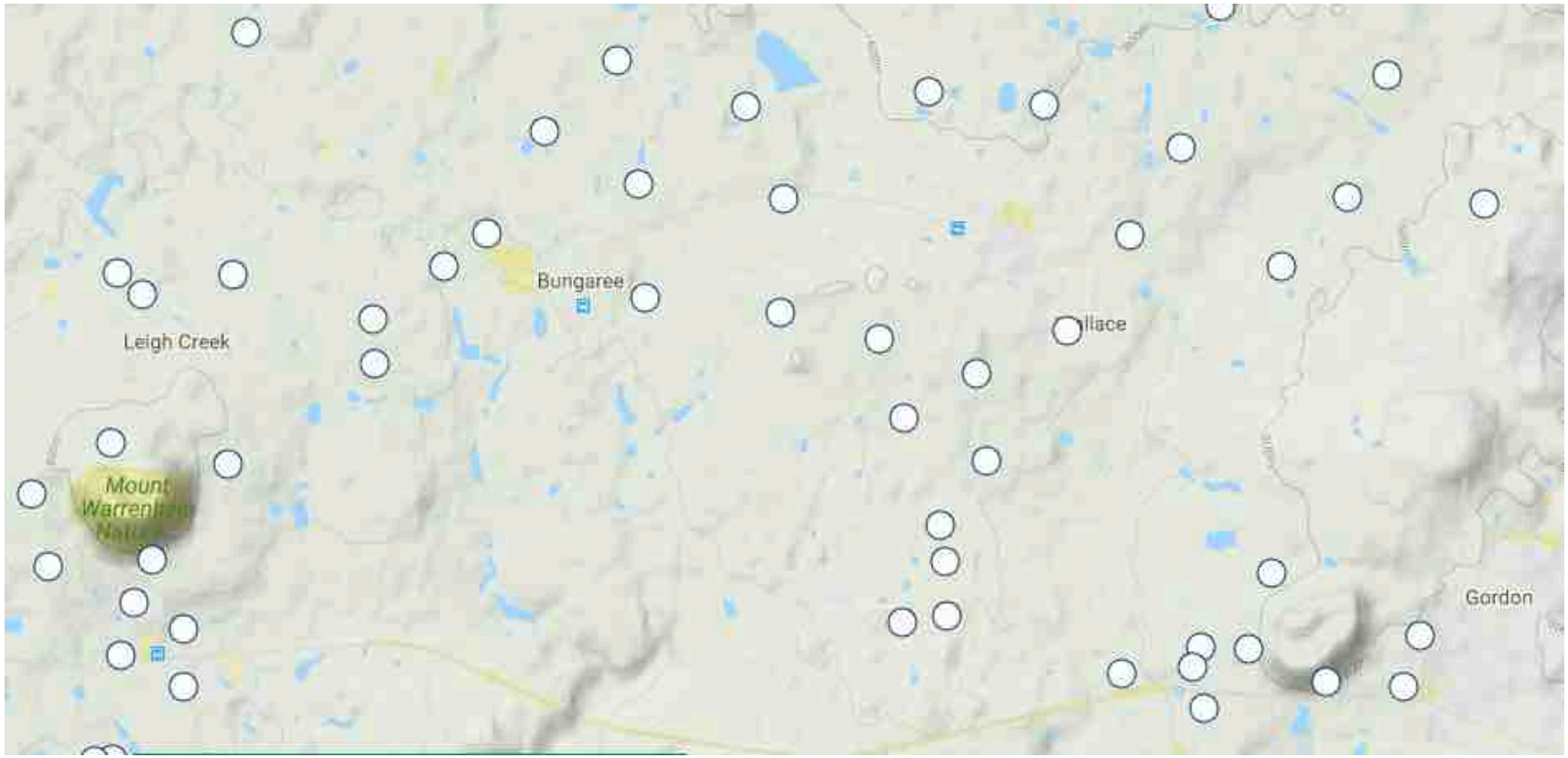


FIGURE 7: LAND OWNERSHIP

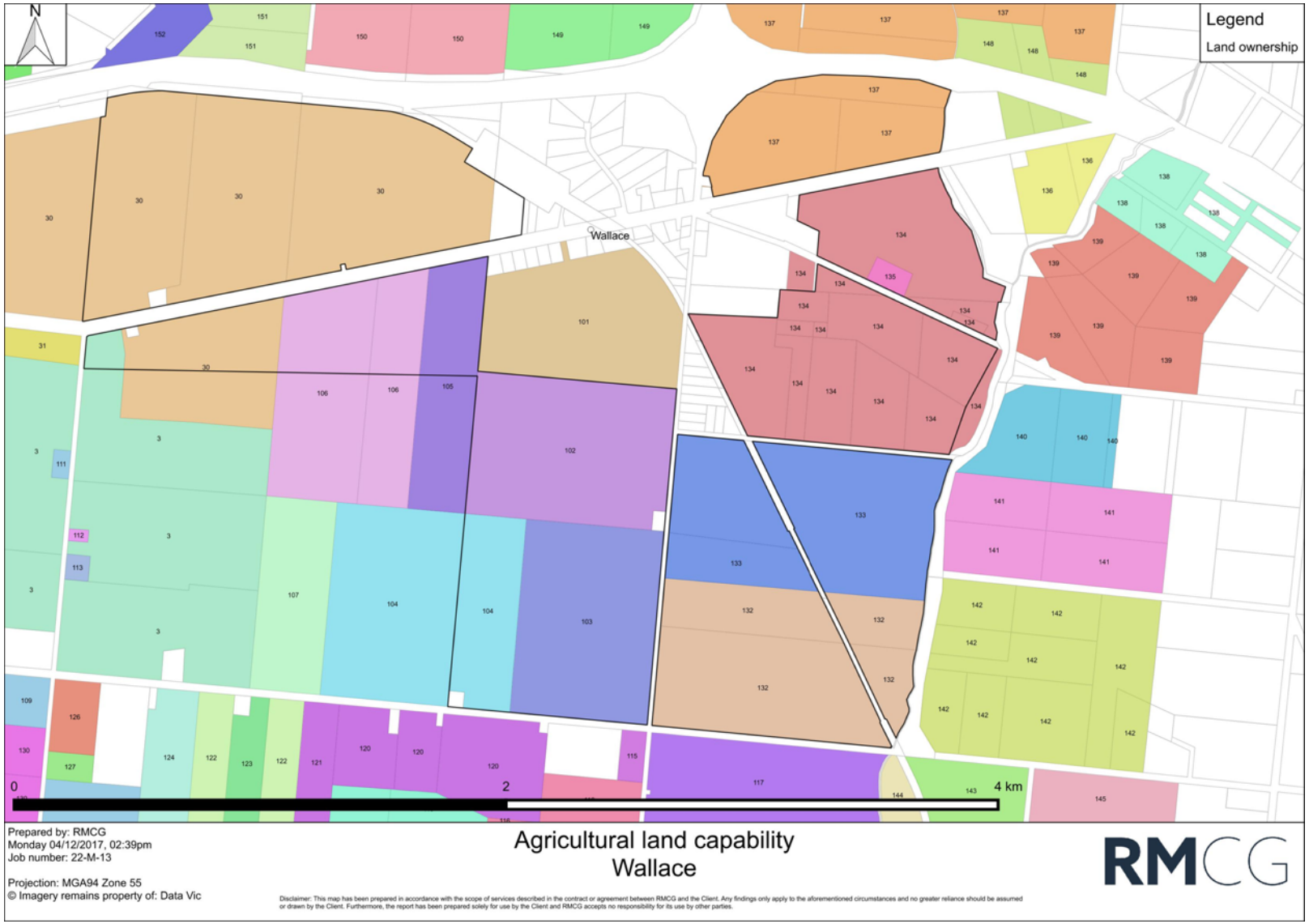


FIGURE 8: PARCEL SIZE

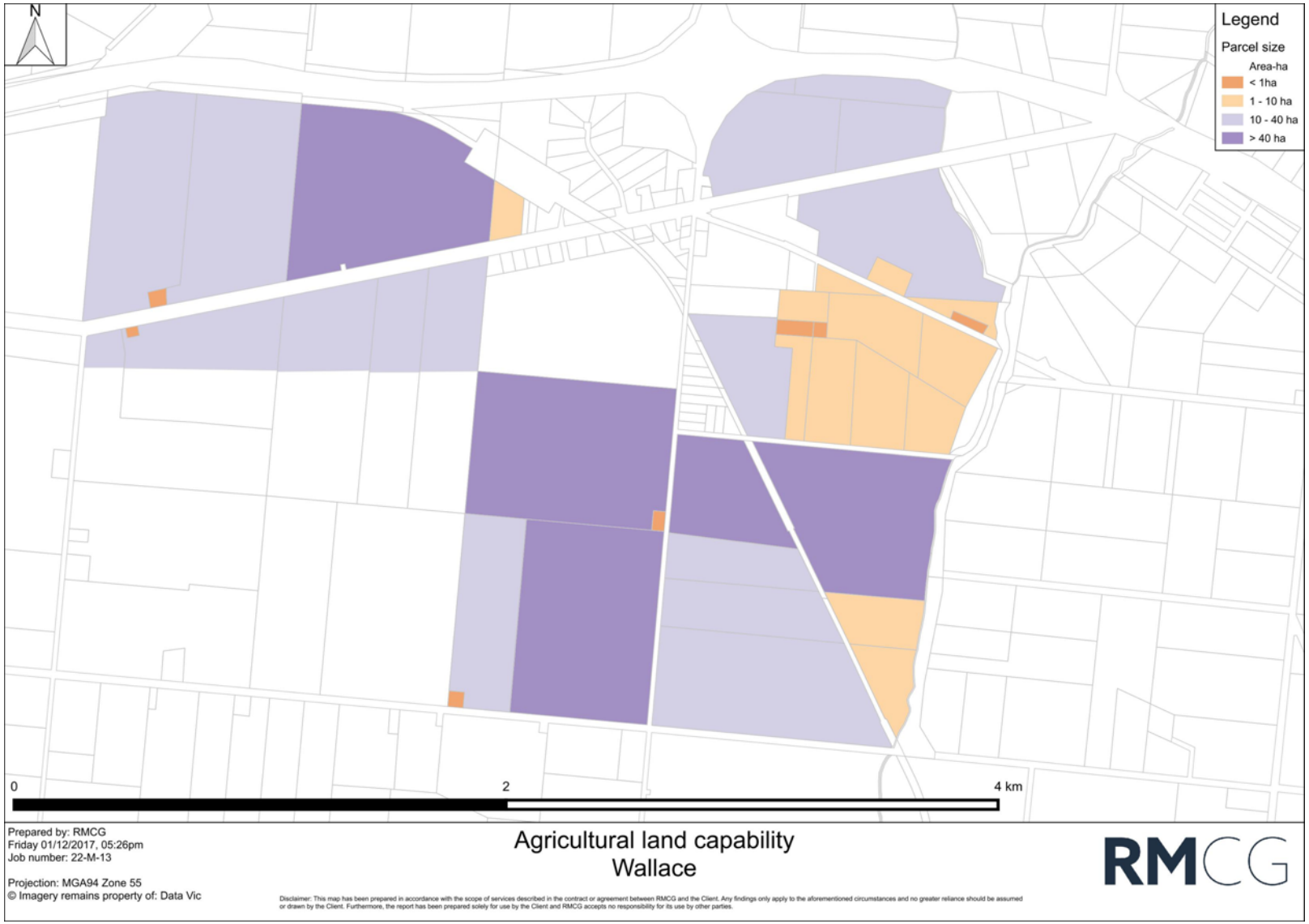


FIGURE 9: AGRICULTURAL CAPABILITY

4 Land use conflict

Land use conflicts are likely to arise where one land user is perceived to infringe upon the rights, values or amenity of another. In rural areas land use conflicts commonly occur between agricultural and residential uses. However, land use conflicts can also occur between different agricultural enterprises and other primary industries including mining, forestry, aquaculture and fishing enterprises.

Rural amenity issues are the most common form of land use conflict. These relate to air quality due to agricultural and rural industry (odour, pesticides, dust, smoke and particulates) use and enjoyment of neighbouring land e.g. noise from machinery, and visual amenity associated with rural industry e.g. the use of netting, planting of monocultures and impacts on views.

The risk of land use conflict currently is expected to be low, given the small population, little local infrastructure and likelihood that most current residents would have some association with and appreciation of surrounding farming businesses and their activities. Providing for residential growth will have a number of consequences that may increase the risk of land use conflict between agriculture and an increase in population:

- Increase in the number of people without association with or appreciation of surrounding farming businesses and their operations
- Increase in local traffic and pedestrians in the town
- Increase in patronage of community infrastructure such as the train station, primary school, recreation facilities.

The assessment found that there is a high risk of land use conflict arising from most of these changes (Table 4).

To reduce the risk of land use conflict, the structure plan should:

- Seek to direct future growth to established areas of residential and township development
- Ensure that new areas of residential development incorporate buffers and setbacks to provide separation between agriculture and residential uses
- Incorporate vegetation screening around new residential development to reduce amenity risks
- Consider road infrastructure and traffic movement to reduce heavy truck movement through the township.

Agricultural operators are required under various legislation to take measures to ensure that they minimise offsite impacts. However, occasionally, agriculture may have unintended offsite impacts. Separating agriculture from sensitive uses is the most effective means of mitigating this risk. There are no prescribed distances from which sensitive uses should be setback from agriculture, apart from agricultural industries covered by a code of practice.

The Queensland Government have prepared Planning Guidelines: Separating Agricultural and Residential Land Uses[6] to minimise offsite impacts from agriculture and recommend separation distances between 150m and 500m and note that incorporating vegetation buffers can reduce the required separation distance. These guidelines could be used to inform preparation of a structure plan.

Consideration should also be given to community engagement and community development activities that can assist in preventing land use conflict such as:

- Educating new residents on the realities of living in an active agricultural area
- Promote relationships and interaction between new residents, established residents and surrounding agricultural businesses.

There may be some interest in the future to promote tourism associated with the deer farm and walnut grove. Protecting visual amenity and maintaining separation from urban-style residential development would support such an outcome.

[6] https://www.dilgp.qld.gov.au/resources/policy/plng-guide-sep-ag.pdf

TABLE 4: LAND USE CONFLICT RISK RANKING

AGRICULTURAL USE	TOWNSHIP USE	POTENTIAL CONFLICT	CONSEQUENCE	PROBABILITY	RISK RANKING
Cropping	Residential	Cropping: Noise, spray drift, heavy traffic through residential areas, stubble burning	A	2	23
		Residents: litter, spray drift and weed infestations from gardens, trespass, restriction on timing and methods of farm operations, increase residents that do not understand rural activities	B	3	17
	Recreation facilities (e.g. sports grounds, community halls)	Cropping: Noise, spray drift (damage to sporting ovals), stubble burning	A	2	23
		Recreation facility: spray drift from ground maintenance, trespass, restriction on timing and methods of farm operations	B	3	17
	Retail (e.g. convenience shop, general store, safe)	Cropping: Noise, spray drift, heavy traffic through residential areas, stubble burning	A	2	23
		Retail: litter, restriction on timing and methods of farm operations	B	4	16
	Train station	Cropping: Noise, odour, spray drift, stubble burning	A	2	23
		Train station: restriction on timing and methods of farm operations	B	4	16
Livestock grazing	Residential	Livestock grazing: Noise, stock movement on local roads, odour, heavy traffic through residential areas	A	3	20
		Residents: Litter, domestic dogs worrying/harming livestock, restriction on timing and methods of farm operations, increase in residents that do not understand rural activities	B	2	21
	Recreation facilities (e.g. sports grounds, community halls)	Livestock grazing: Noise, stock movement on local roads, odour, heavy traffic through residential areas	C	4	8
		Recreation facilities: Litter, scaring stock, restriction on timing and methods of farm operations	C	4	8
	Retail (e.g. convenience shop, general store, safe)	Livestock grazing: Noise, stock movement on local roads, odour, heavy traffic through residential areas	B	4	12
		Retail: litter, restriction on timing and methods of farm operations	C	4	8
	Train station	Livestock grazing: Noise, stock movement on local roads, odour, heavy traffic through residential areas	C	4	8
		Train station: restriction on timing and methods of farm operations	C	4	8

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