

From: "Kristoff Bakkes" <kristoffbakkes@gmail.com>
Sent: Mon, 30 May 2022 23:48:22 +1000
To: hvc@huonvalley.tas.gov.au
Subject: Draft Huon Valley Local Provisions Schedule
Attachments: TSPP Representation 364 Mountain River Road Mountain River Tasmania 7109.pdf, , Farm Management Plan 364 Mountain River Road Mountain River removed.pdf, , smime.p7s

To whom it may concern

Please find attached letter of representation and supporting document.

Kind regards

Kristoff Bakkes
kristoffbakkes@gmail.com

The Tasmanian Planning Commission

Level 3/144

Macquarie Street

Hobart

7000

REPRESENTATIONS TO TASMANIA STATE PLANNING PROVISIONS (TSPP):

Request to rezone the Property from new proposed Agriculture Zone to Rural Zone

We Louise and Kristoff Bakkes impacted as owners and community members, living and contactable at:

Address: 364 Mountain River Road, Mountain River 7109

Email address: kristoW akkes@gmail.com

Phone Number: 0405 223 769 and 0439 639 628

...make the following representa_ons in respect of the proposed updated SPP to the Tasmanian Planning Commission.

Identified "Property":

Affected Site Address: 364 Mountain River Road, Mountain River, Tasmania, 7109

Property Iden_fica_on Code.: 9883926

Request to rezone the above mentioned Property from the newly proposed Agriculture Zone(TSPP 21.0) to Rural Zone (TSPP 20.0)

Justification as follows:

1. Existing Zone Purpose

The *Property* is currently zoned as Agriculture Zone. The Tasmanian Planning Commission is brought to the attention that the Agriculture Zone's main purpose is to ensure land(resource) is used as a resource for agricultural purposes and the land is to be identified as **prime agricultural land, soil is used as growth medium** as detailed in the main purpose of this zone.

“

21.1 Zone Purpose

The purpose of the Agriculture Zone is:

21.1.1 To provide for the use or development of land for agricultural use.

21.1.2 To protect land for the use or development of agricultural use by minimising:

(a) conflict with or interference from non-agricultural uses;

(b) non-agricultural use or development that precludes the return of the land to agricultural use; and

(c) use of land for non-agricultural use in irrigation districts.

21.1.3 To provide for use or development that supports the use of the land for agricultural use.

“

As detailed in the TSPP 21.0 , 21.2 Use Table for Agriculture Zone:

“

Resource Development

If:

(a) on land other than prime agricultural land; or

(b) an agricultural use, excluding plantation forestry, on prime agricultural land if it is dependent on the soil as the growth medium or conducted in a manner which does not alter, disturb or damage the existing soil profile or preclude it from future use as a growth medium.

“

The Objective of this Zone details that the land's main purposes even under discretionary use is to be used for agricultural purposes as listed in 21.3 Use Standards, 21.3.1 Discretionary uses:

“

Objective:

That uses listed as Discretionary:

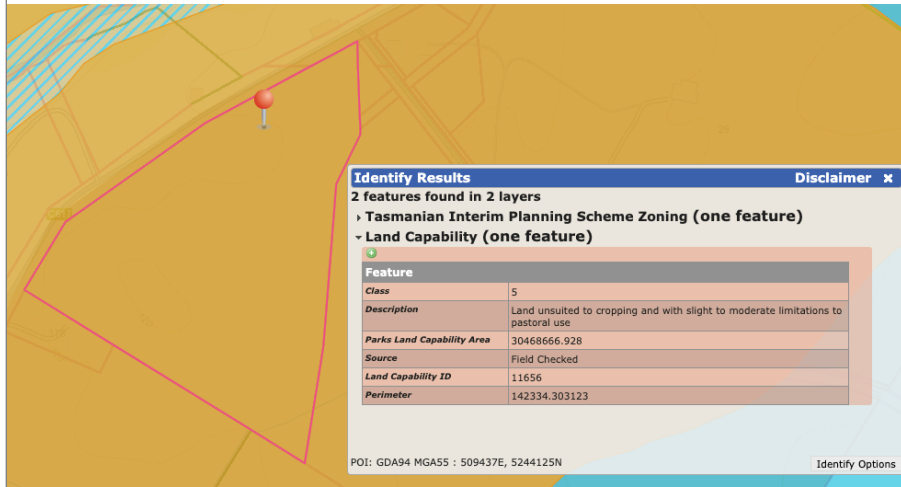
(a) support agricultural use; and

(b) protect land for agricultural use by minimising the conversion of land to non-agricultural use.

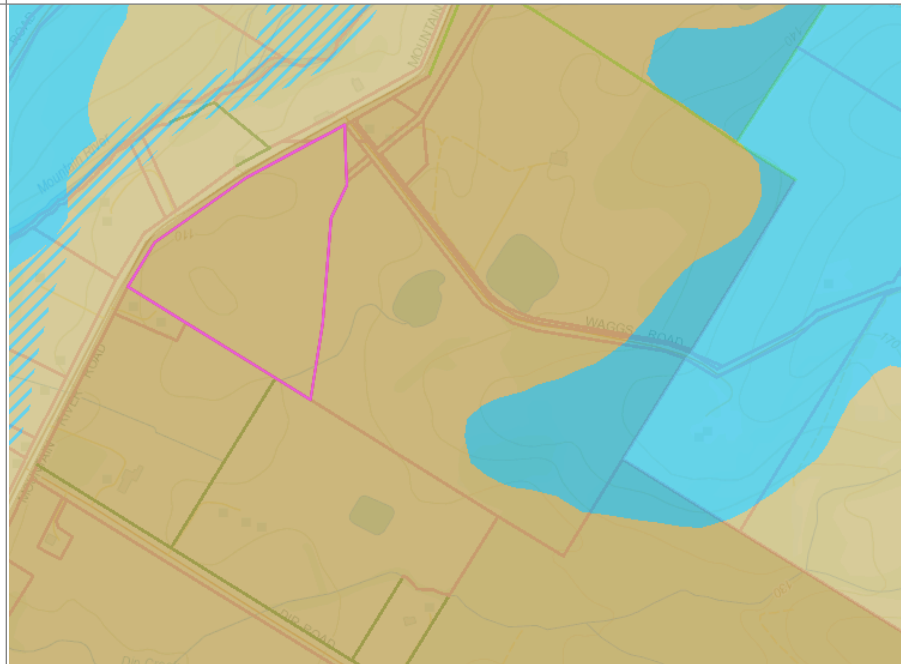
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2. Property's Land Limitations

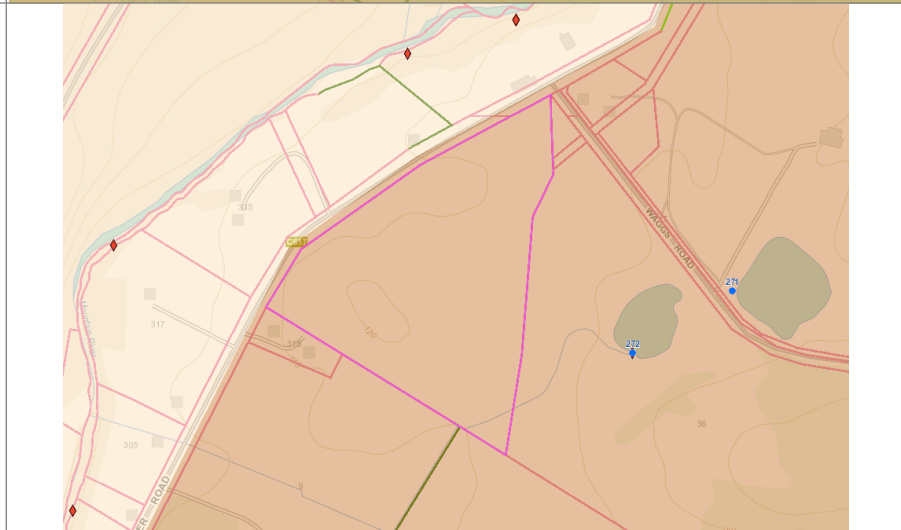
Land Capability Factor more than 60% of the Property is classified as “unsuited to Cropping and with slight to moderate limitations to pastoral use” the remaining of the land is classified as “land marginally suited to grazing due to severe limitations”.



Neighbouring properties zoned as Agricultural use has the same limitation as experienced on the Property



The property does not have any dams or access to water.

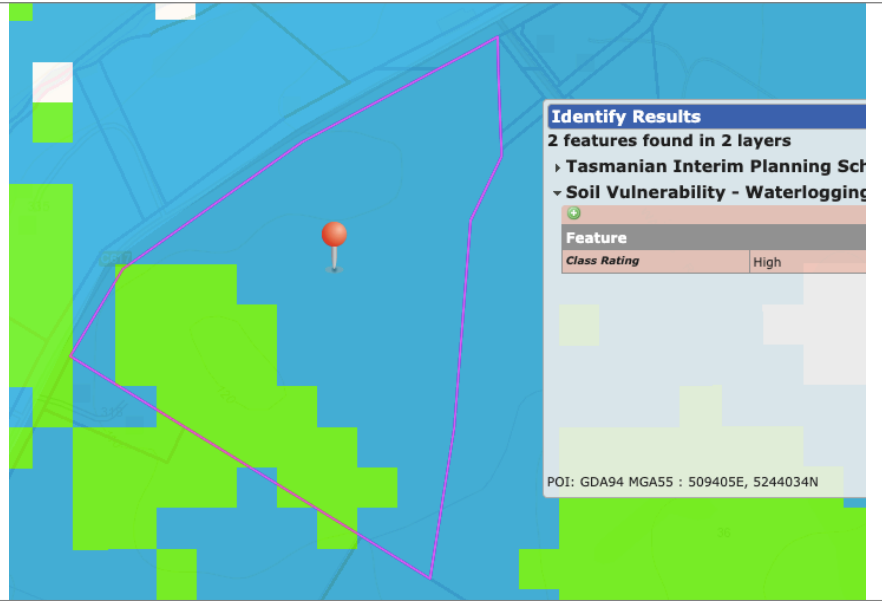


Topographical Limitations

1)

Soil Vulnerability due to Waterlogging Hazard

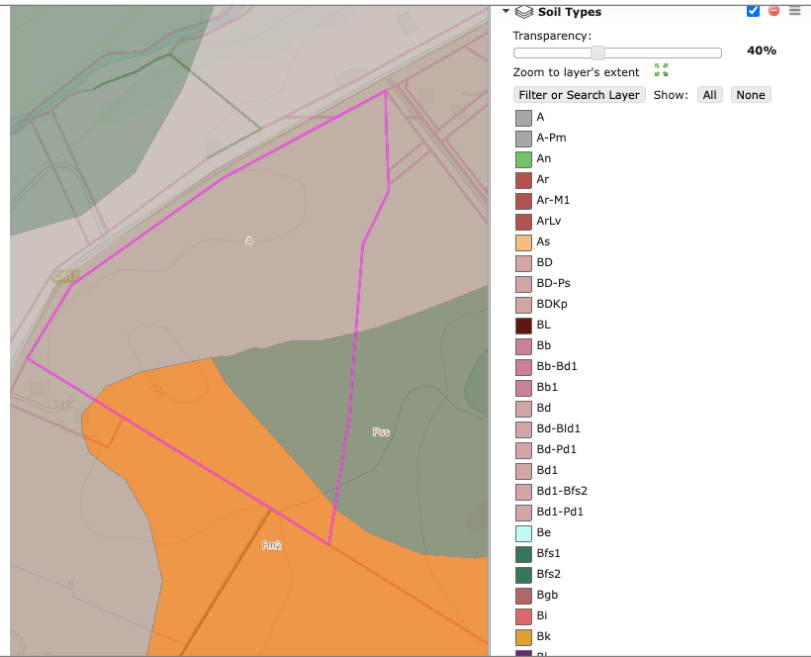
Waterlogging limiting use of soil as grow medium and thus limiting use of Property for resource use.



2)

Soil Types

A third of the Property's soil is identified as Podzol and podzolic soils on sandstone with mudstone.



3. Proposed Changed Zone

It is strongly recommended to the Tasmanian Planning Commission to consider changing the zoning of this property to Rural Zone. As explained in the above-mentioned property limitations it is evident that this parcel of land should be classified for rural purposes. However, there are strongly supported soil/resource limitations, which leads to restrictive cropping development. It is therefore recommended to change this Property's zoning to Rural Zone to support the agricultural intent on the already approved planning permit enterprise.

It is noted that the latest DA planning, as approved by the Huon Valley Council 292:2021, approved the use of land for a Lavender Farm Enterprise. These activities require the use of a rural location and land parcel as classified as Rural at minimum which is the case West of the land Parcel.

20.0 Rural Zone

20.1 Zone Purpose

The purpose of the Rural Zone is:

20.1.1 To provide for a range of use or development in a rural location:

(a) where agricultural use is limited or marginal due to topographical, environmental or other site or regional characteristics;

(b) that requires a rural location for operational reasons;

(c) is compatible with agricultural use if occurring on agricultural land;

(d) minimises adverse impacts on surrounding uses.

20.1.2 To minimise conversion of agricultural land for non-agricultural use.

20.1.3 To ensure that use or development is of a scale and intensity that is appropriate for a rural location and does not compromise the function of surrounding settlements.

“

Furthermore, the Property does not have access to the Mountain River water scheme to support consistent agricultural cropping activities. The property does have access to intermittent subsidiary stream to the Mountain River which would support limited agricultural use.

By changing the zoning of this Property and any other adjacent properties who also applied for this change, will support further development and optimal use of the land for permitted Rural uses. Rural Zoning protects and promotes supported agricultural use and therefore will not negatively impact any other properties in the area with Agriculture Zoning.

4. Supporting Documents:

I. FARM MANAGEMENT PLAN

Farm Management Plan

“Mountain River
Lavender Farm”

364 Mountain River
Road, Mountain
River

Report Prepared by
Dean Suckling
Enprove Pty Ltd

Report Date:
11th August 2021



Contents

PLAN OBJECTIVE:	3
PROPERTY DETAILS:	3
PROPOSAL OVERVIEW:	4
Indicative Agricultural Comparison Revenues:	6
SITE LOCATION AND PROPERTY MAPS:	7
Map 1: Property Location:	7
Map 2: Proposed Property Map	8
Map 3: Proposed Layout.....	9
FARMING FACTORS:	10
Site Topography:	10
Climate:	10
Water Supply:	10
Weed and Pest Management:	10
Fire Management:	11
Adverse impacts on adjacent land:	11
Adverse impacts from adjacent land:	11
Soils:	11
Regenerative / Carbon Farming:	12
Crop Design:	12
Livestock:	12
Bees and Honey:	12
Infrastructure and Business Management:	13
Required Infrastructure:	13
Services Connections:	13
Staffing:	13
Allowance for possible future expansion:	13
Marketing / Sales:	13
Opportunity Cost:	14
Biosecurity Requirements:	14
FINANCIAL PROJECTIONS:	15
Development Timeline:	16
ENVIRONMENTAL FACTORS:	17
Natural Resource Management:	17
Erosion, Compaction & Landslide Hazard:	17
Groundwater:	17
Drainage:	17
Flood Zones:	17
SITE IMAGES:	18

Plan Objective:

This Farm Management Plan is drawn to provide an assessment of current agricultural activities and identify future improvements that will benefit the agricultural production values of the property, and identify benefits of the proposed dwelling at Lot 2 Mountain River Road, Mountain River.

This plan is for establishing and managing a lavender farm, constructing a dwelling and shedding to support the lavender farm and placing a roadside stall to sell products. A small number of sheep and chickens will also be kept at the property.

Future plans include the manufacture of lavender based products, and the creation of tourist facilities and photo opportunities but these designs are yet to be finalised and not part of this plan.

Property Details:

Proponents:	Kristoff Bakkes
Property Address:	Lot 2, Mountain River Road, Mountain River
Property Description(s):	9883926
Area:	6.5 Hectares (16.2 acres)
Local Authority:	Huon Valley Shire
Zoning / Overlay(s):	Significant Agriculture Zone
Current Use:	Ad hoc Fodder Production

Proposal Overview:

Lavender is one of the most identifiable aromatics, yet Australian produced lavender is at a serious shortfall with most products imported. This proposal calls for the introduction of a substantial lavender farm to produce lavender bunches and oils. The presence of a resident in a dwelling is seen as an important part of the successful and productive management and monitoring of those plants. The lavender will be produced by industry best practice management to ensure a premium product and return.

This plan is for the first stage of the farm development, which is establishing a productive lavender farm and producing dried lavender and essential oils for sale. There is land reserved for future planting to occur as the business grows and establishes.

Lavender farming is high-value agriculture and often returns greater revenues than many larger-scale agricultural enterprises. Lavender production suits smaller properties as larger producers shy away from the higher labour inputs and greater risks inherent in a low chemical environment. Lavender is an enduring product, enjoying a sustained demand in a sometimes fickle consumer market. This product has several consumer uses, including dried bunches, dried aromatics, medicants, oils and propagated plants for sale. In the future, Mountain River Lavender will also value add and produce finished products like soap, essential oil, skin care products, perfumes, deodorisers and potpourri bags but the plants need to be established first.

The enterprise will be good for the local tourist trade, lavender farm visits are popular, weddings and insta photos in lavender farms are on-trend, a visitor garden will be developed and an on-farm shop constructed, but these plans are yet to be finalised and not included here.

The proponents have purchased the property and will develop the enterprise subject to the permit to construct a dwelling on the property. This is their first lavender production venture, but they have experience in agriculture in South Africa.

The property has been used for adhoc grazing and hay production each year. It is currently sitting vacant pending direction. The property has fair soil quality, has few modern agricultural grasses and has no infrastructure. In the current condition, the pastoral production is estimated to be 2 tonnes of plant dry matter per annum (about 4 tonnes of hay) per hectare. A notional agricultural production value of \$6,000 per annum could be assigned to the current production.

The development of the enterprise calls for the investment in the agricultural infrastructure of over \$30,000, the improvement of soils to a productive agricultural level and the investment of a dwelling and shedding.

After the initial development period, the horticulture will produce 10,000 bunches of dried lavender, 300 litres of distilled lavender oil and 2,000 potted lavender plants for sale. This will provide an agricultural return of \$160,000 each year, and this is conservative.

Siting a dwelling on the property means that the property can be confidently improved, knowing that those improvements can be effectively utilised to increase productive value. A resident also means that animals can be monitored for health and welfare and rotated through the paddocks to ensure maximum feed utilisation.

This enterprise is seen as a great example of high-value horticultural production contained within the Significant Agriculture Zone while contributing to the local economy and encouraging tourism.

The justifications for a dwelling on a small lot farm are the same as justifications for any farming property. The management times and tasks can be similar:

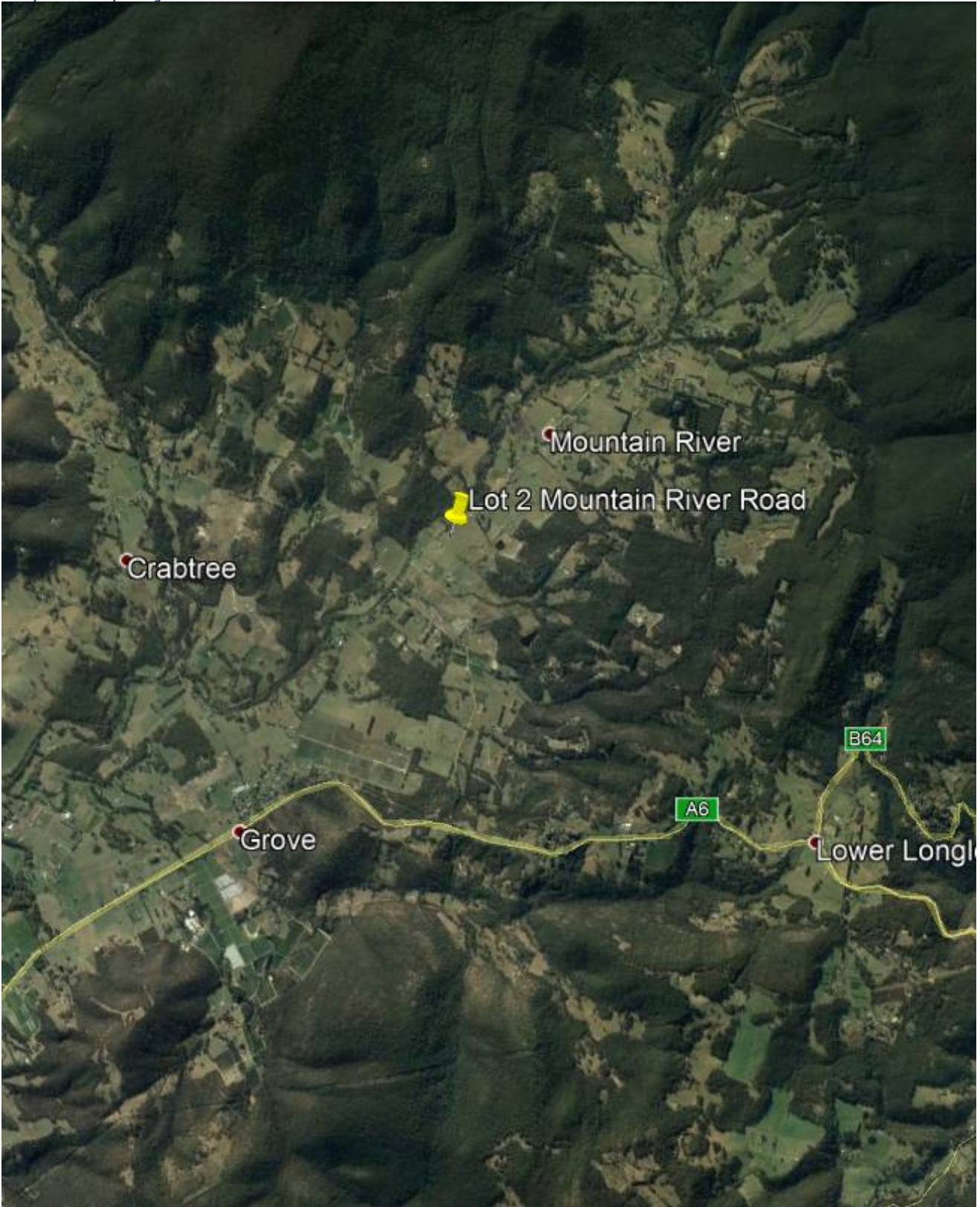
- **Pest Animal Control:** Probably the biggest issue on a lavender crop. Rabbits and echidnas will dig up, establishing lavender plants; this will wreck a young plant. Parrots, cockatoos, and wallabies will nip plant leaders, restricting plant establishment or flower stems.
- **Biosecurity:** New nationally mandated biosecurity requirements mean all visitors, vehicles and new plant stock to the property need to be screened and, if necessary, disinfected. This needs to be monitored constantly.
- **Monitor Lavender (typical daily routine),** check water, check for pests, check for fungus, check supports, check flowers.
- **Monitor Flowers for Harvest:** Flowers need to be monitored daily for readiness and harvested accordingly.
- **Monitor and react to weather:** Heat, frost, hail and wind can play havoc and responding quickly with a management decision can save a crop or minimise losses.
- **Security and prevention of theft of produce and equipment:**
- **Prevention of trespassers:** Strangers are attracted to lavender farms and feel they can wander across the property.
- **Do the work:** Lavender must be constantly pruned, thinned and headed, pests controlled, and grass mowed.
- **Weeding:** Herbicides cannot be used, so hand weeding is the main weed control technique.
- **Wildfire risk prevention and response:** In the advent of wildfire, residents in the dwelling will be more responsive, fire mitigation procedures implemented, and even fires fought.
- **Harvest and dry the lavender:** The drying process is time-consuming, and not all can be hung simultaneously, so constant rotation is required.

A dwelling on a farm is a lot more than a place where people reside. It has an essential and ancillary purpose as a farm office, administrative centre, meeting room, first aid shed, security and biosecurity checkpoint, tea room, toilet block, and monitoring post for 24 hours a day, 365 days a day year business.

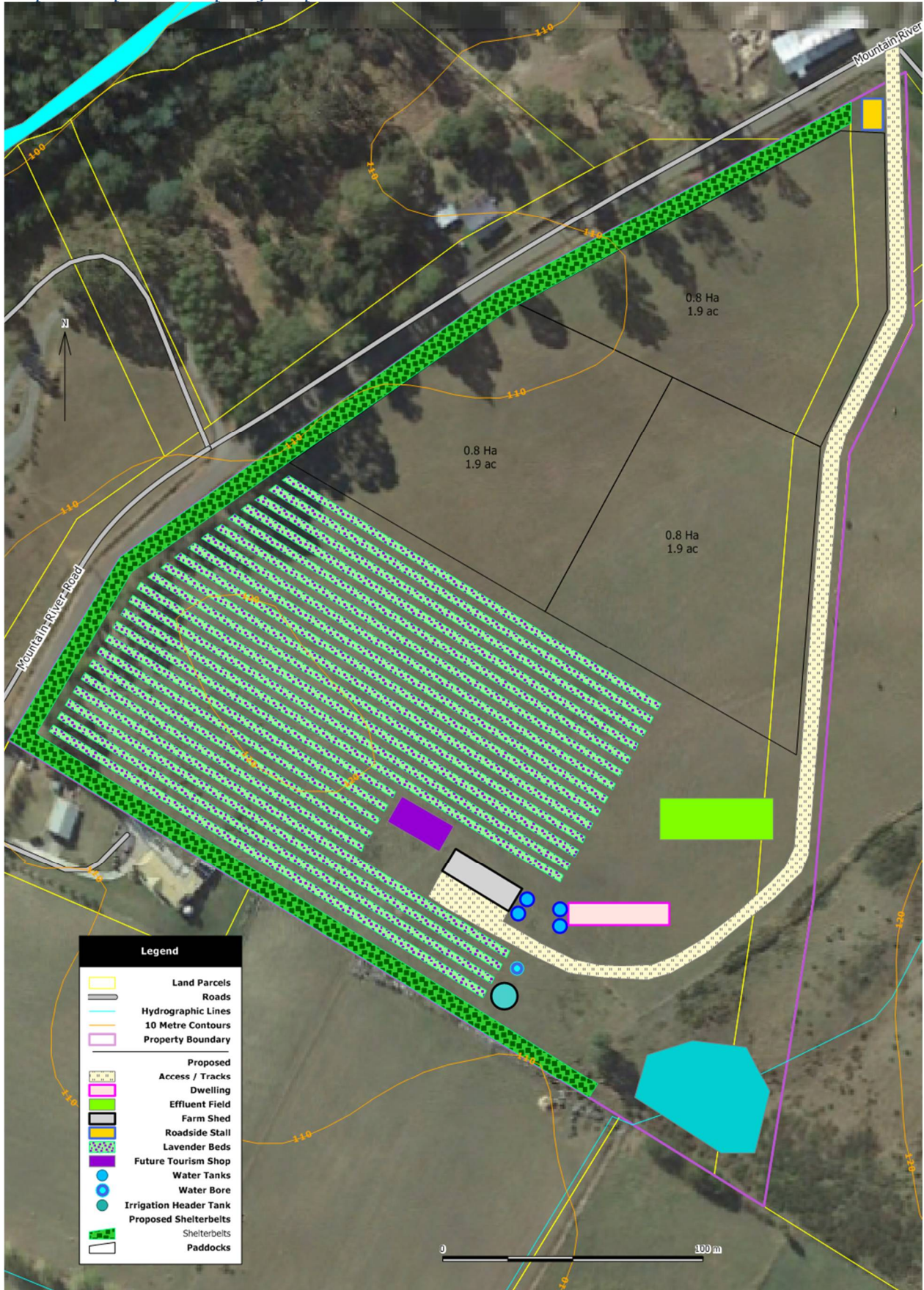
Good farming is about timeliness, and constantly monitoring and reacting quickly is incredibly important. Failing to do so costs production and, sometimes, viability. The farm size is almost irrelevant, the quality of the farm management is what matters, and it's very difficult to achieve that remotely.

Site Location and Property Maps:

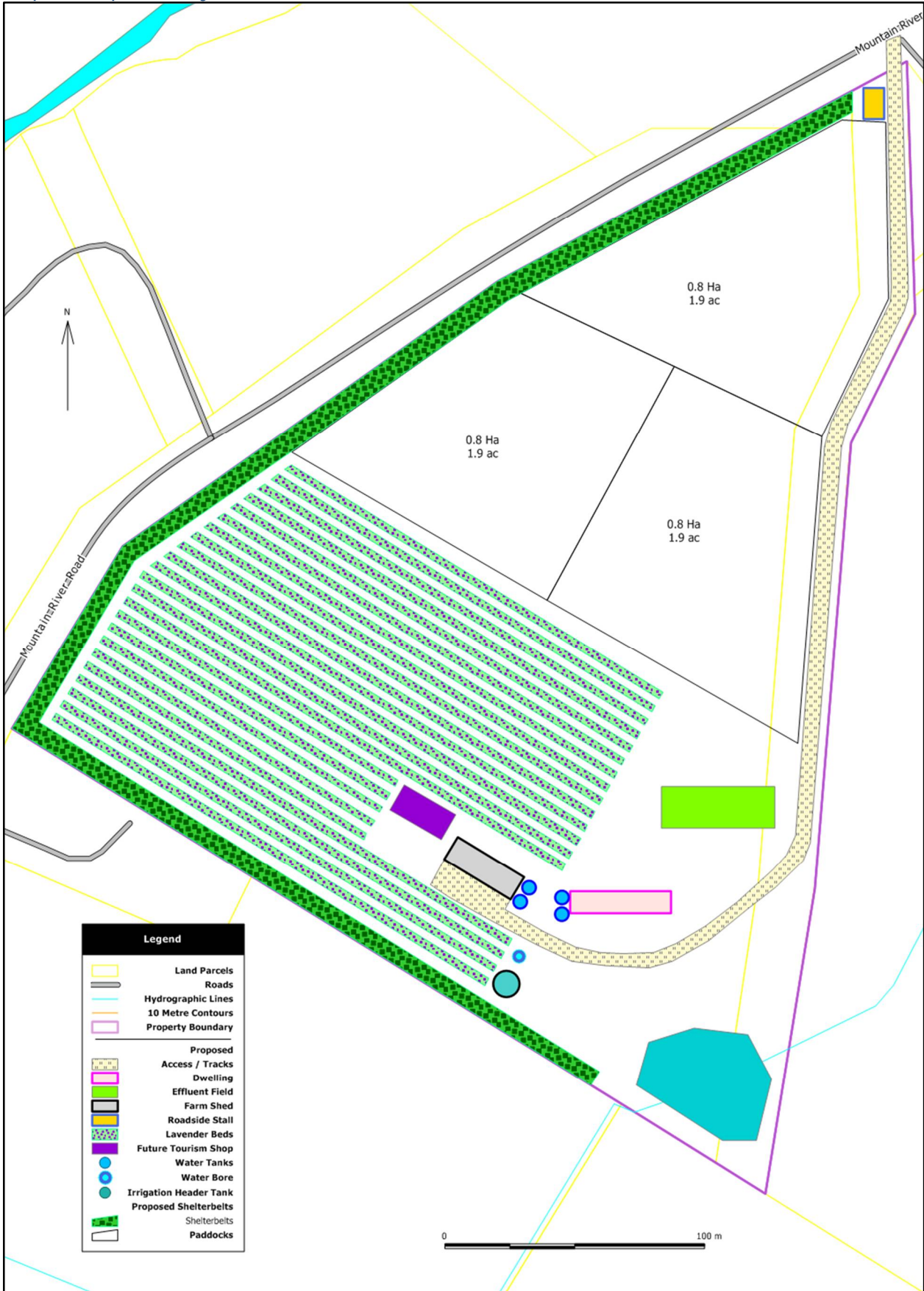
Map 1: Property Location:



Map 2: Proposed Property Map



Map 3: Proposed Layout



Farming Factors:

Site Topography:

The topography at the property is a gentle slope rising from the north to the south with a minor rocky ridge at the southern end. An intermittent and indistinctly formed waterway crosses the south-eastern corner. There are no major topological features on the site. Total elevation change is approximately 12 metres across the site, giving an average gradient of 3.0 %. The most productive soils are at the northern end and are to be used for paddocks; the ridge at the southern end is least productive and is used for the dwelling and shedding.

Climate:

Mountain River climate statistics:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Max (°C)	23.5	22.7	21.3	17.9	15.0	12.6	12.2	13.3	15.4	17.4	19.3	21.3	17.7
Mean Min (°C)	9.9	9.2	8.1	5.8	4.4	2.1	1.9	2.6	4.3	5.6	7.5	8.6	5.8
Mean Rain (mm)	37.8	29.2	43.8	43.2	52.4	55.7	65.7	85.9	74.6	63.6	51.5	53.4	700.9
Median Rain (mm)	31.9	25.6	36.8	41.0	46.9	48.2	54.5	85.3	67.0	56.2	55.8	55.1	697.8
Mean Rain Days	5.7	5.7	7.6	8.8	10.1	8.0	10.9	12.7	10.7	10.7	9.5	9.0	109.4

Data: BOM 094220 Grove

The climate is the typical Mediterranean type of warm, dry summers and cool, wet winters. The climate is good for the chosen agricultural activity.

Water Supply:

Lavender is not a major user of water and, when established, can be produced with minimal water. Irrigation may be necessary for establishing plants or if the weather gets dry. High water use can also impact flowering and scent intensity, so water use is well controlled.

Being soil-based, the lavender should receive adequate water from the average rainfall, but a water bore is to be installed to ensure production security. A new farm dam of about one megalitre holding capacity is also to be constructed, and this is filled by runoff during an average winter. There will also be 450,000 litres of rainfall available for harvest from the rooves of the shed and the dwelling.

Weed and Pest Management:

The property is not subject to any significant pest and weed issues but has some blackberry issues along some fence lines and the wet areas. These have been sprayed and will continue to be controlled. Any environmental and agricultural pests and weeds will be controlled by standard farm management methods such as sprays and/or physical removal.

The property appears to be clear of any animal pest issues.

Fire Management:

The land is in a designated bushfire area, although not of any greater risk than normal farmland. The land use is not seen to contribute any fire risk to the area as horticulture is constantly managed and, as a green crop, will act as fire breaks. Firewater supply will be available from tanks attached to the house and shed, and minimum water supply held as per any recommended conditions.

Adverse impacts on adjacent land:

There is not expected to be any change to the amenity of the adjacent land from the agricultural enterprise. Some animal odour or machinery noise may be generated from time to time, but the same as any similar agricultural enterprise. Truck transport would need to access the property from time to time, but this would be less than once a week. Shelterbelts are to be planted to provide visual separation from the nearest neighbour at the south.

Adverse impacts from adjacent land:

The properties within a 500-metre radius from the proposed dwelling are grazing farms or lifestyle properties. Those activities generate minimal dust, odour, noise and chemical spray activity and do not create any issues for this farming.

Soils:

An agricultural soil test was collected from the main paddock area. The property land class is typical of the region, productive well-structured loams over clay classed as duplex soil. The soils may be prone to waterlogging during wet periods and drying and cracking during dry periods but generally retain productivity.

Paddock observations (soil tests at rear):

- Soil is rated as loam.
- Slightly low pH (CaCl₂) 4.8 is slightly acidic. Aluminium is still in a good range.
- Good phosphorus levels (Olsen P 16.1 mg/Kg)
- Good potassium levels (111 mg/Kg)
- Good sulphur levels (9.9 mg/Kg)
- Good Organic Carbon (4.8 %)
- Low nitrogen levels (seasonally variable)
- Trace elements are fair, although boron will be required to improve flowering.
- Good cation levels and ratios (indicating soil structure and balance issues), calcium is at the high end of ideal, and potassium is slightly low. Exchangeable aluminium is slightly elevated.
- Low conductivity and good exchangeable sodium levels indicating no sodicity or salinity issue.

Recommendations:

Soil acidity management is the major requirement for the successful establishment of lavender. Agricultural lime should be ground spread to correct acidity in topsoil, and lime should be worked into the rows if they are ripped before planting. Lavender requires good soil calcium and a neutral pH in the soil to create optimum growth. Agricultural lime (calcium carbonate) will be required at a rate of 2 tonnes per acre (5 tonnes per hectare).

Other soil fertility levels are well suited to lavender which does not require high fertility.

Regenerative / Carbon Farming:

A regenerative approach to soil management is to be adopted to improve agricultural soil quality. This will focus on improving soil carbon with compost and poultry manures. It will also stimulate soil biology, improve soil water holding capacity, increase topsoil depth and improve plant rooting and nutrient cycling.

A naturalistic approach will be adopted to managing the property generally; manufactured chemicals will be avoided as best practical. The property will adopt techniques to increase soil carbon and ultimately be positioned to take advantage of any future soil carbon credits. All by-products of the processing will be used back into the soil as a compost material.

Crop Design:

A total area of 2.0 hectares is planned to be sown to lavender crops in raised beds. This will provide an indicative 20,000 lavender plants when fully established. This development will be staged over several years for work and water management and ensure supply consistency. Commercial lavender has an effective plant life of 6-7 years before it needs to be replaced; one area will be planted or replaced each year.

A small area of lavender is to be planted initially, and this area will provide an ongoing propagation crop for the remainder of the planting. After that initial establishment, cuttings will be taken and propagated each year to allow the remainder of the crop to be sown in a cost-effective method. Some of these cuttings will also be propagated in pots to produce lavender plants for sale

True lavender (English lavender) will be used for production; this is a lower production crop but has a stronger lavender scent and achieves a premium return. Initially, the focus will be on the dried lavender product, and value-added products will follow from there.

Livestock:

Each year, a small growout flock of 15 lambs will be brought in to utilise the pasture area and control the grass at the property. Sheep can also graze the lavender growing area to control grasses and fertilise crops as they do not eat lavender plants themselves.

10-15 chickens will also be kept on the property for egg production, and this will provide the additional services of weed and pest control and fertility management in amongst the lavender.

Bees and Honey:

A lavender farm is inevitably a paradise for bees, and 4-5 hives will be trialed at the property to encourage honey production and pollination. One hundred and fifty litres of honey might be produced, but this aspect is not resolved yet. An increase of bees in an area where pesticide use has historically been high would be environmentally beneficial.

Infrastructure and Business Management:

Required Infrastructure:

There is no infrastructure on the property for the proposed enterprise. The dwelling, shedding, access and water bore and watering network will need to be constructed. There are no buildings suitable for the enterprise, and there are no services connected. Lavender itself does not require any particular infrastructure apart from the provision of irrigation, which will be pressure compensated drip irrigation.

An all-weather driveway will be constructed of extracted material to the house site to access in all weather conditions. Formed tracks will be constructed to the lavender beds allowing convenient access.

Services Connections:

The property has power and telephone along the front fence available for connection; it will not have access to gas, mains water and sewer. Water for the dwelling will be from harvested rainwater collected in tanks attached to the buildings.

Domestic effluent will need to be land applied, and water from the effluent system could be suitable for irrigation use along subsurface irrigation lines. Alternatively, an effluent application field of a suggested 350 square metres will be required for dispersal (based on loam soil type).

Staffing:

The proponents will develop and manage the lavender farm. They have an extensive agricultural background in farming in South Africa. Typically a hectare in horticulture is expected to need about 300 hours per year to manage, weed, shape and harvest, the establishment probably twice that.

With property management, marketing, ongoing propagation, drying, packing, and distilling the oil, the enterprise will want 2-3000 hours invested each year. It will be busy. As the enterprise grows, additional labour will be required.

These types of enterprises contribute to the local economy by utilising local contractors for construction work, farm maintenance, transport industries, and agricultural support industries.

Allowance for possible future expansion:

There is good scope to double the lavender production within the property and by offering the planned value-adding of products and the agritourism activities. Any major increase in lavender growing would require additional land.

Marketing / Sales:

Marketing is not resolved yet; there will be no product for 2-3 years. The proponents are keen to create their own marketing brand and realise the full value of their products. A roadside stall will be constructed selling potted and dried lavender products. Local retailers will also be approached to sell the product, and eventually, they will open their own shop.

Otherwise, there are plenty of buyers for quality lavender oil ranging from multinationals to local artisans. Dried lavender is also a remarkably robust marketplace, with craft shops and cafes being big buyers.

Opportunity Cost:

A property like this is unlikely to be integrated into another farming property due to land size and property value. Horticulture is one of the higher returning agricultural activities, and the presented farming has a very good return per area used. There are few forms of agriculture with better returns from soil-based farming.

Biosecurity Requirements:

Lavender plants are generally resistant to major pests or diseases, but pests can travel with seeds, flowers, and other plant material and should be inspected. Only clean certified plants from a certified supplier will be used for planting, and excess plant material should not be sent to other properties without being checked for any insects, larvae and fungus. Any movement into or out of the state or district should comply with Agricultural Department requirements and products sterilised as and if required. Report any suspicious outbreaks to the appropriate authority.

Livestock should also be monitored for any disease issues. Sheep will be required to have ear tags for buying and selling and appropriate transfer forms completed to track any issues.

Vehicles entering and leaving the farming area should have clean wheel arches, and shared farm equipment must always be cleaned before entering or leaving the site.

Development Timeline:

Year	Actions
2021/22	Permits General Site Clean-up for appearance, access safety and fire safety Lavender ordered (First stage) Soil conditioning and soil preparation works Building construction and works begin Ongoing weed and pest controls
2022/23	Lavender rows prepared. First Lavender planted in autumn Building works completed Revegetation along the waterway for erosion control commences Ongoing weed and pest controls Minor Lavender harvest in summer, cuttings for next stage prepared in autumn
2023/24	Lavender rows prepared. Next lavender planted in autumn Building works completed Ongoing weed and pest controls First major Lavender harvest in summer. Cuttings for the next stage are prepared in autumn. Propagation of cuttings into pots for sale
2024/25	Lavender rows prepared. Next lavender planted in autumn Building works completed Ongoing weed and pest controls Lavender harvest in summer. Cuttings for the next stage are prepared in autumn. Propagation of cuttings into pots for sale
2025/26	Lavender rows prepared. Next lavender planted in autumn Building works completed Ongoing weed and pest controls Lavender harvest in summer. Cuttings for the next stage are prepared in autumn. Propagation of cuttings into pots for sale

Environmental Factors:

Natural Resource Management:

There are no major resource assets on the property having been cleared for agriculture. There are some individual paddock trees, and these will be retained and included in revegetation areas. There are no significant waterways, although there is an indistinct waterway area at the southeast corner. This area is covered by the Water Protection Overlay and is in poor condition with a blackberry establishment. It will be excluded from any farming activity and will become a small dam for collecting farm water. A significant vegetation planting will occur along the southern and western boundary enclosing the only remaining paddock trees.

Erosion, Compaction & Landslide Hazard:

The property has a low risk of erosion or landslide. Sound vegetation cover can be maintained, the water collection areas are small, and the property is not steep.

Compaction of soils in the paddocks could occur in traffic areas such as gateways, troughs, fencelines and sheltered areas. Heavy vehicle traffic should be confined to constructed tracks, particularly during wetter seasons.

Groundwater:

Groundwater is seasonally variable at a depth of 10 - 20 metres and is at low risk from exposure to any form of nutrients infiltrating from the surface due to sound vegetation cover. Maintaining plant coverage will manage soil nutrient levels lower to minimise any risk.

Drainage:

The property has no formal drainage network relying on overland flows and ground infiltration. There is a minor waterway at the south-eastern corner, which, as previously discussed, will have a small dam constructed to secure stock water supply; this will be below licencing requirements.

Flood Zones:

The property is clear of any flood areas.

I certify that all the above statements are true and correct to the best of my abilities.



Dean Suckling
Agricultural and Environmental Consultant

Attached:

Soil Tests

Site Images:

Image 1: Looking northeast across the site (before the dividing fence construction)



Image 2: Looking south to the house site and the lavender planting area



Image 3: Existing entrance to be retained and upgraded



Image 4: Waterway at South Eastern Corner



Image 5: Future lavender production area




Image 6: Looking along the Mountain River Road boundary



Image 7: Proposed Dwelling Site



Soil Test Results

Customer:	Kristoff	
Sample Date:	11/06/2021	
Sample Name:	Front	
Lab. No.	5FS19022	
Test Type:	Soil Analysis Lavender - Comprehensive and Particle Sizing	

Test Depth (cm)	0-10
Soil Colour	Grey Black
Gravel	0%
Assessed Texture	Sandy Clay Loam

	Unit	Level Found	Good Range
Phosphorus Olsen	mg/Kg	16.1	10
Phosphorus Colwell	mg/Kg	34	30
Potassium Colwell	mg/Kg	111	120 - 200
Sulphur	mg/Kg	9.9	10 - 20
Organic Carbon	%	4.8	3 - 6
Ammonium Nitrogen	mg/Kg	8	
Nitrate Nitrogen	mg/Kg	3	
Conductivity	dS/m	0.08	< 4.0
pH Level (H ₂ O)	pH	5.7	6.5 - 7.5
pH Level (CaCl ₂)	pH	4.8	5.6 - 6.6
Aluminium (CaCl ₂)	mg/Kg	1.4	< 2.0
DTPA Copper	mg/Kg	3.64	> 1.5
DTPA Iron	mg/Kg	147	100 - 400
DTPA Manganese	mg/Kg	12	> 20
DTPA Zinc	mg/Kg	3.8	> 5
Boron (Hot CaCl ₂)	mg/Kg	0.5	> 1.5

Cations	Unit	Level Found	Good Range
Cation Exchange Capacity	meq/100g	8.29	5 - 20
Exchangeable Calcium	meq/100g	6.98	
	BSP %	84.20	70 - 85
Exchangeable Magnesium	meq/100g	0.88	
	BSP %	10.62	10 - 20
Exchangeable Potassium	meq/100g	0.18	
	BSP %	2.17	3 - 8
Exchangeable Sodium	meq/100g	0.10	
	BSP %	1.21	< 5
Exchangeable Aluminium	meq/100g	0.15	
	BSP %	1.81	< 2.0

MIR Particle Sizing	Unit	Level Found	
Sand	%	65.50	
Silt	%	9.51	
Clay	%	24.98	

Classification	Sandy Clay Loam
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soil testing	nutrient management	effluent management
dung beetles	water quality analysis	farm mapping
All tests are conducted in a laboratory with ASPAC accreditation.		

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