PP269/2019-1

1695 Carlisle Road CARLISLE RIVER

C/A: 13B V/F: 9428/691, LIC: 0511060

Two (2) Lot Subdivision and Creation of Access in Road Zone Category One (1)

L M Toussaint & Rod Bright & Associates Pty Ltd & G J Toussaint

Officer - Ian Williams

EXHIBITION FILE

Submissions to this planning application will be accepted until a decision is made on the application.

If you would like to make a submission relating to a planning permit application, you must do so in writing to the Planning Department

Application for Planning Permit for a Subdivision

Supplied by	Katy Bright
Submitted Date	22/11/2019

Application Details

Application Type	Planning Permit for a Subdivision
	Version 1
Applicant Reference Number	81-40
Application name or Estate name	Toussaint
Responsible Authority Name	Colac Otway Shire
Responsible Authority Reference Number(s)	(Not Supplied)
SPEAR Reference Number	S150038H
Application Status	Submitted
Planning Permit Issue Date	NA
Planning Permit Expiry Date	NA

The Land

Primary Parcel

1695 CARLISLE ROAD, CARLISLE RIVER VIC 3239
Crown Allotment No 13B
Parish Name NATTE MURRANG
SPI 13B\PP3286
CPN 21778

Zone:	35.07 Farming
Overlay:	44.06 Bushfire Management
	44.01 Erosion Management
	42.01 Environmental Significance
	44.04 Land Subject to Inundation

The Proposal

Plan Number	(Not Supplied)
Number of lots	2
Proposal Description	Two lot subdivision, create a new additional access to a RDZ1 road
Estimated cost of the development for which a permit is required $	0

Existing Conditions

Existing Conditions Description	Existing farm, dwelling and farm infrastructure
Title Information - Does the proposal breach an encumbrance on Title?	Encumbrances on title, such as a restrictive covenant, section 173 agreement or other obligation such as an easement or building envelope do not apply.

Applicant Contact

Applicant Contact

Ms Katy Bright
Rod Bright and Associates Pty Ltd
26 Murray Street, Colac, VIC, 3250

Business Phone: (03)5231 4883
Mobile Phone: 0415 635 420
Fax: (03)5231 4883
Email: katy@rodbrightlds.com.au

Applicant

Applicant 1	Mr Gaetan (Guy) Toussaint 1695 Carlisle Road, Carlisle River, VIC, Australia Mobile Phone: 0459614340 Email: lauren.toussaint@bigpond.com
Applicant 2	Ms Lauren Toussaint 1695 Carlisle Road, Carlisle River, VIC, Australia Mobile Phone: 0459614340 Email: lauren.toussaint@bigpond.com

Owner

Owner 1	(Owner details as per Applicant 1)
Owner 2	(Owner details as per Applicant 2)

Declaration

I, Katy Bright, declare that the owner (if not myself) has been notified about this application.

I, Katy Bright, declare that all the information supplied is true.

Authorised by	Katy Bright
Organisation	Rod Bright and Associates Pty Ltd

ROD BRIGHT & ASSOCIATES PTY. LTD.
LAND SURVEYORS & TOWN PLANNERS
A.C.N. 007 206 975 A.B.N. 50 007 206 975

Tel. (03) 5231 4883
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20 Murray Street,
Colac 3250
P.O. Box 371

22 November 2019

REF: 18-40

Colac Otway Shire
P.O. Box 283
COLAC VIC 3250

Attention: Bláithín Butler, Statutory Planning Coordinator

Dear Bláithín,

RE: PLANNING PERMIT APPLICATION
TWO LOT SUBDIVISION
1695 CARLISLE ROAD, CARLISLE RIVER
CA13B, PARISH OF NATTE MURRANG
G. & L. TOUSSAINT

Please find enclosed a summary page of the application for a planning permit for the proposed subdivision for the above property, which has been submitted to Colac Otway Shire using **SPEAR** (ref.S150038H).

The application comprises the following documents:

- Copy of title;
- Plan of proposed subdivision;
- Plan of proposed subdivision with aerial image;
- Planning permit application form;
- Geotechnical Assessment (AGR Geotechnical);
- Bushfire Management Statement & Plan (Rod Bright & Assoc.);

We would appreciate if Colac Otway Shire could provide an invoice to our client for the statutory application fee which we anticipate to comprise $1318.10 (Class 18 Two lot subdivision).

The following information is provided in support of the application and comprises a response to the planning policy framework and the decision guidelines of the zone to satisfy the application requirements of the Colac Otway Planning Scheme.

The title currently comprises land in TP283119D containing 98.15 hectares.

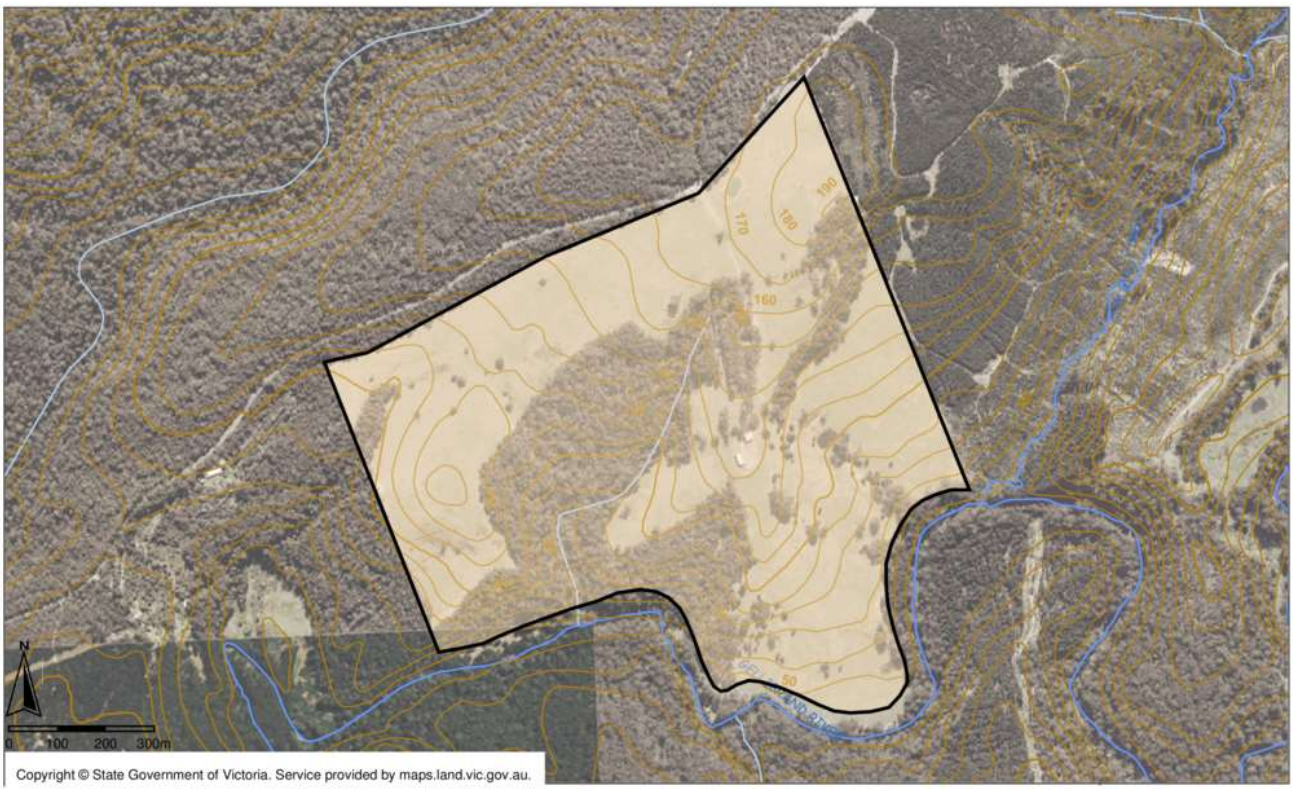


Figure 1: Google Earth aerial image.

The land is currently farmed by grazing sheep and cattle for meat production and some horticulture – vegetable production.

The property comprises open grazing pasture with gentle slopes interspersed with steeper vegetated gullies. Generally, the land has a southerly aspect with fall towards the Gellibrand River which forms the southern boundary. A small creek tributary of the river runs through the main gully.

An existing powerline traverses the allotment generally from east to west and an electricity easement will be required as part of the formal survey and drafting of the plan of subdivision.

A number of dams, stockyards and farm sheds and an existing dwelling are located on the land. Remnant vegetation including riparian vegetation in the gully is generally fenced from stock access. The landholders have been implementing a farm plan which targets removal of identified areas of thistles and blackberries and excludes stock from native vegetation.

Approval is sought to create two new allotments which follow existing fence-lines and the farm plan:

- Lot 1: Approx. 52.08ha including the existing access track, existing stockyards, existing farm sheds and infrastructure, and existing dwelling, areas of remnant vegetation and areas of grazing pasture.
- Lot 2: Approx. 44.10ha including areas of remnant vegetation and grazing pasture. A new access cross-over is required to enter the new allotment from the Carlisle Road

Subdivision approval is sought to enable the owners to reduce their land holdings and concentrate efforts into a smaller farming area.

The current owners have no intentions around potential dwellings within proposed Lot 2. Building envelopes have been identified on the Bushfire Management Plan only to satisfy the subdivision application requirements of the BMO and CFA. Similarly, the geotechnical assessment submitted with the application identifies areas which should be excluded for future development however buildings and works within the property do not form part of this permit application.

A new cross over to an existing farm gate at the property line will be required to complete the subdivision and these works do form part of the permit application.

Colac Otway Planning Scheme Zones & Overlays:

The land is zoned Farming (FZ).
Carlisle Road is a Category 1 Road in a Road Zone (RDZ1).
The land is affected by the

- Environment Significance Overlay 3 – Declared Water Supply Catchments (ESO3);
- Bushfire Management Overlay (BMO);
- Erosion Management Overlay 1 – Land Susceptible to Landslip & Erosion (ESO1),

The Gellibrand River is affected by the Land Subject to Inundation Overlay (LSIO);
The Vegetation Protection Overlay 2 – Roadside Vegetation (VPO2) applies to the Carlisle Road.
Parts of the land are areas of Aboriginal Cultural Heritage Sensitivity.
The property is in a designated Bushfire Prone Area.

Relevant planning policy is extensive and is not listed for reference in this summary. Consideration of relevant matters identified by the planning scheme policy and provisions is provided below:

Farming Zone:
The land is zoned Farming. Approval for the subdivision is sought in relation to clause 35.07-3. A permit is required to subdivide land. Each lot must be at least 40 hectares.

The subdivision creating lots over 40ha and continued implementation of the farm plan is consistent with the purpose of the Farming Zone which has the purpose of providing for the use of the land for agriculture, and to encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.

RDZ1
Carlisle Road is in a Road Zone, Category 1.
The existing access point is shown in the following photos:

Photo 1: Existing property entry.

Photo 2: Carlisle Road site distance from existing entrance to east.

Photo 3: Carlisle Road, existing entrance site distance to west.

Photo 4: Existing road access to stockyards.

Approval is sought under clause to 52.29-2 to subdivide and create a new access to the Carlisle Road.

Utilising the existing access point was considered in the subdivision design, however the new access is required to enable the existing stockyards to remain with proposed Lot 1.

The proposed new entry point is approximately 50 metres west of the existing entrance point with an existing farm gate providing access currently.

Photo 5: Existing farm gate. Proposed entry to Lot 2.

Photo 6 (above) and Photo 7 (below): Proposed access point to Lot 2.

Photo 8: Proposed road access point to east.

Photo 9: Proposed entry point view to west.

Environment Significance Overlay 3:
The land is within a proclaimed water catchment, and the Environment Significance Overlay 3 applies to the land reflecting this status. The ESO3 supports state and local planning policy in relation to water quality and catchment and land protection.
A permit is required to subdivide land under the provisions of this overlay 42.01-2. A decision guideline of this overlay is the *Interim Guideline for Planning Permit Applications in Open Water Supply Catchment Areas.*

The proposed subdivision creating lots larger than 40ha with minimal other dwellings in a 1km radius will ensure Guideline 1: the maximum density of potential dwellings of 1:40ha will be met.

If future development or works are considered in the future, detailed land capability analysis can be undertaken at that time.

Erosion Management Overlay 1
The land is within the EMO1 and has an objective of ensuring that development will be carried out in a manner which will no adversely increase the landslip risk to life or property affecting the subject land or adjoining or nearby land, and to ensure that development is not carried out unless the risks associated with the development is a Tolerable Risk or lower. The EMO1 supports state and local planning policy in relation to environmental hazards.
A permit is required to subdivide land under the provisions of this overlay 44.01-5.
The geotechnical assessment (AGR GeoSciences Pty Ltd) addresses the objectives and requirements of this overlay. Refer to attached assessment.

Bushfire Management Overlay
The Bushfire Management Overlay applies to the land with the objectives of protecting human life, strengthening community resilience to bushfire and ensuring development is only permitted were the risk to life and property from bushfire can be reduced to an acceptable level. The BMO supports state and local planning policy in relation to bushfire.

A permit is required for subdivision by 44.06-2. The provisions for bushfire relate to potential dwellings and are silent regarding subdivision of farm allotments. The attached bushfire management statement (Rod Bright & Assoc) addresses the provisions in relation to the potential future development of proposed Lot 2 for a dwelling.

Vegetation Protection Overlay (roadside vegetation)

Vegetation along the Carlisle Road is protected by the VPO2. The schedule notes the important role of roadside vegetation in providing strategic biodiversity links for flora and fauna and its importance in the visual landscape.

A permit is required to remove, destroy or lop any native vegetation.

The new cross-over will not require removal of native vegetation.

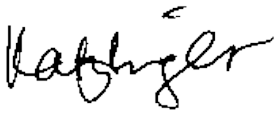
Areas of Aboriginal Cultural Heritage Sensitivity

The subdivision of land into 2 or less lots is not considered a high impact activity under the Aboriginal Cultural Heritage Regulations 2018, (Section 49 Subdivision of Land), and a Cultural Heritage Management Plan is not required in relation to this subdivision.

General
Photos on the following pages provide a general depiction of the site and surrounds.

We trust the information provided explains the proposal and await further instructions regarding public notice in due course.

Yours faithfully,



.....
Katy Bright
ROD BRIGHT & ASSOCIATES

encl.
copy: L & G Toussaint

Photo 10: Existing internal driveway/track

Photo 11: Existing stockyards adjacent to entry point

Photo 12: Area proposed Lot 2

Photo 13: As above

Photo 14: Elevated area of proposed Lot 2

Photo 15: Fenced remnant vegetation

GEOTECHNICAL ASSESSMENT

FOR

1695 CARLISLE ROAD CARLISLE RIVER, VICTORIA

Prepared for:	G & L Toussaint
Prepared by:	David J Horwood Senior Engineering Geologist *BAppSc (Geology); MAusIMM CP(Geo)*
Approved by:	 David J Horwood Director
Reference No.	19I429GTA
Date:	15/10/2019
Revised:	

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EXECUTIVE SUMMARY

Our geotechnical assessment has found that as with many sites in the Carlisle River/Gellibrand area, there are risks to property damage due to conceivable landslide events on the subject site.

- Rural, 96.18 ha farming property containing existing farmhouse, shedding, stockyards, stock fencing and several farm dams. Most of the property consists of cleared grazing land with isolated trees. Some large sections of native forest occupy natural drainage lines, creeks and gullies.

- Natural slope angles on site range from 3° to 6° along the crest and upper Paleocene slopes (generally to the west), 11° to 15° on the flanks of the Paleocene hill tops and Otway Group slopes and as much as 20° to 33° over the steep valley and lower Otway Group hill slopes.

- Natural soils consist of silty SAND with trace quartz gravels overlying an iron oxide cemented Ferecrete, overlying sandy CLAY, with trace medium grained, sub-angular quartz gravels. Clay grades silty with depth and grades more plastic.

- The underlying geology encountered is consistent with that of the Paleocene Wiridjil Gravel referenced in published geological maps and exposed in cuttings along Carlisle Road.

- The composition of the upper soil layers along the northern property boundary on the gentle crest slopes indicates the natural soils are interpreted as being in-situ and not belonging to Bedrock was not observed during this investigation however regional bedrock structures indicate the property lies within regional monoclines on the southern limb of the Ferguson Hill Anticline.

- Numerous existing landslides located on site and recorded in the inventory. Most of the inventory records coincide with the presence of the Eumeralla Formation Otway Group sediments or the margins of the Wiridjil Gravel in contact with the Eumeralla Formation.

- Mapped landslides are present in the north-west corner of the property and within the major drainage system in the centre of the property.

- The local ground model for landslide hazards involves shallow and deeper-seated translational earth-slides and earth flows on the margins of the Wiridjil Gravel, on steeper hill slopes and on the steep, south facing lower hill slopes of the Eumeralla Formation north of the Gellibrand River.

Our assessment has found that there are areas on this property where slope instability or landslide hazards may pose greater than an ACCEPTABLE risk to life and property if developed. There are however substantial areas of the property where slope instability and landslide risk are considered negligible and can achieve an ACCEPTABLE risk level and may be suitable for future development.

Based on our assessment, we conclude that there is sufficient land on the subject site that can achieve an ACCEPTABLE risk level with respect to any future development that the proposal for subdivision may be considered. In these areas an ACCEPTABLE risk level can be achieved for future development and can remain so over the design life of any development (50 years).

We conclude that a detailed Landslip Risk Assessment is not warranted and that there are no geotechnical reasons to prevent the issue of a permit for the proposed subdivision subject to the subject to the recommendations in Section 6.0.

1.0 INTRODUCTION

Landslides and other forms of earth and rock movements are common throughout the Otway Ranges and like erosion, they are a natural process of geological shaping of the environment.

Any building within a "geologically active" environment such as the Otway Ranges is potentially at risk of damage due to natural soil movements. In some circumstances, serious building damage, personal injury or even death may result from landslides. Whilst the risks due to soil movement can usually be identified and steps can often be taken to manage or reduce the risks to acceptable levels, it is not feasible to eliminate the risks of damage or injury entirely.

2.0 SCOPE OF REPORT

AGR Geosciences Pty Ltd (AGR) was commissioned by Rod Bright & Associates on behalf of G & L Toussaint (the Client's) to provide a Geotechnical Assessment of No.1695 Carlisle Road, Carlisle River (the Site) to meet the geotechnical assessment requirements of the Colac-Otway Shire Planning Scheme Amendment C68: Schedule 1 to the Erosion Management Overlay (EMO).

The principles used in conducting Geotechnical Assessment follow the guidelines published in the Australian Geomechanics Society (AGS) journal Volume 42 No 1 of March 2007, entitled "Landslide Risk Management". This report contains all the information required for a Geotechnical Assessment as defined by Schedule 1 to the EMO.

The purpose of the assessment is to identify any possible landslide hazards or areas of potential instability within the proposed for subdivision and provide an assessment as to whether the subdivided land is suitable for future development. The assessment also intends to provide guidance and options on how landslide risks can be reduced, avoided or controlled with respect to any future development.

3.0 DEVELOPMENT DESCRIPTION

- Rural 96.18 ha farming property containing existing farmhouse, shedding, stockyards, stock fencing, farm dams, cleared grazing land and large areas of native forest.
- Proposed subdivision separating the property into two allotments 52.08 ha and 44.1 ha in size respectively.
- All existing farm infrastructure (buildings, dams, stockyards) to be contained within the proposed Lot 1.
- No plans for development of Lot 2 at the time of subdivision.

An existing conditions plan for the proposed subdivision attached as Appendix II.

4.0 HAZARD ANALYSIS

4.1 DATA GATHERING – DESK TOP STUDIES AND PREVIOUS INVESTIGATIONS

Numerous geotechnical assessments, landslide risk assessments and landslide studies have been conducted in the Otway Ranges, many by private consultants for individual clients and some published reports are also available. Many of these reports confirm that landslide hazards are present and that in some cases, inappropriate development can lead to slope failure.

In preparation for conducting a field investigation of the site, preliminary data was gathered from the following sources:

- Landslide and Erosion Susceptibility mapping published by the Corangamite Catchment Management Authority.
- Landslide and Erosion Inventory mapping published by the Corangamite Catchment Management Authority.
- Fed Uni Spatial Landslide and Erosion Database Online.
- Geological Reports and Maps published by the Geological Survey of Victoria and published 1:50,000 and 1:250,000 geological mapping published online via GeoVic and Earth Resources Victoria.
- Factor Data Sets such as slope, elevation, rainfall, aspect, land use, vegetation, geomorphology and soil landforms published by the Corangamite Catchment Management Authority.
- Geomorphological, landform, topographic, soil and climatic data published by the Department of Environment and Primary Industries available via Victorian Resources Online.
- Aerial photos and maps published by Google and NearMaps.
- Previous investigations and reports by AGR and other consultants both published and unpublished.
- Plan of Proposed Subdivision prepared by Rod Bright & Associates.

4.1.1 Geology and Geomorphology

Regional development of the Otway Ranges began as Australia pulled away from Antarctica during the Late Jurassic to Early Cretaceous, initiating rift valley volcanism and deposition which ultimately formed the Otway Ranges. Lower Cretaceous sediments of the regionally expansive Otway Group make up most of the Otway Ranges in southwestern Victoria. The Eumeralla Formation, by far the most expansive formation in Otway Group, comprises mostly of fluvial channel deposited lithic sandstones, mudstones, siltstones and minor mud-clast conglomerate.

The sandstones and mudstones are characteristically quartz-poor volcanogenic sediments high in calcic feldspars derived from dacitic volcanic material which originated from contemporaneous rift valley volcanism to the north of the Otway Ranges. Post deposition the Otway Group has been gently folded, faulted and uplifted along a series of parallel faults trending north-east.

The composition of the Eumeralla Formation makes it highly susceptible to weathering producing clay rich soils typically 0.5-1m thick in sandstone dominant areas and up to and greater than 2m deep in siltstone/mudstone dominant areas. A typical soil profile is generally well-developed

overlying and sometimes grading into extremely and highly weathered rock. The weathering profile continues to progressively grade into fresh rock.

Following significant uplift during the Late Cretaceous a period of widespread erosion prevailed resulting in the deposition of terrestrial sediments known as the Wiridjil Gravel during the Paleocene in braided river systems belonging to a high energy fluviatile environment. The Wiridjil Gravel consists of unconsolidated coarse quartz sands, silt and clays as well as gravels and minor pebble and cobble layers. Throughout the Carlisle River and Gellibrand districts the Wiridjil Gravel directly overlies the Eumeralla Formation forming a capping over the Lower Cretaceous sediments.

At the cessation of this period of erosion, the sea again transgressed, and a variety of sediments were deposited in the mostly marine conditions which existed on the flanks of the Otway Ranges throughout the Tertiary Period. Grading laterally and locally overlying the Wiridjil Gravels are the Paleocene Moomowroong Sands deposited in marginal marine conditions such as a shallow clastic sea, channelized coastal streams and beach deposits. The Moomowroong Sands consist of massive, fine to medium grained quartz and mica sands with minor clay.

The Gellibrand Marl is another sedimentary formation deposited during the Tertiary (Miocene) at the height of the Miocene transgression in deep marine waters. The marl is a greyish calcareous clay and clayey silt varying to a silty and clayey limestone. When highly weathered it forms highly plastic yellow-brown calcareous clay.

During the Late Miocene the sea began to retreat giving way to shallower marine conditions.

During the Pliocene, following widespread uplift, a peneplain developed over Miocene sediments following shallowing of the sea during the Oligocene. At this time, sea level again began to rise, depositing sediments in a shallow marginal-marine environment extensively covering the Otway Basin and flanks of the Otway Ranges.

Since the end of the Tertiary, sea levels have consistently fluctuated with the last major interglacial period occurring around 110,000BP (before present). Between 14,000 and 6,000BP, sea levels rose rapidly following the last glacial maximum around 17,000 to 20,000BP. As the sea advanced, it pushed coastal dunes in front of it, on lapping Tertiary aged sediments along the coast until sea levels again dropped, slightly renewing erosion rates around 6,000 years ago.

The subject site can be described as belonging to the Bunker Hill System of the deeply dissected upland ranges of the Southern Uplands (Geomorphic Unit 3.2.2). This land system occupies the areas of deeply dissected hills abutting the Gellibrand River characterised by broad ridge crests and upper slopes and hills with gentle upper slopes, steep lower slopes and deep valleys.

Geomorphic development of the landscape is heavily influenced by landslides. Rapid valley development by the rivers and creeks and their tributaries resulted from uplift of the Otway Ranges and fluctuations in sea levels. Landslide activity is commonly correlated to over steepened valley slopes where their occurrence has continuously shaped the landscape over the past 5000-6000 years since lower stream base levels and warmer (wetter) climates have prevailed.

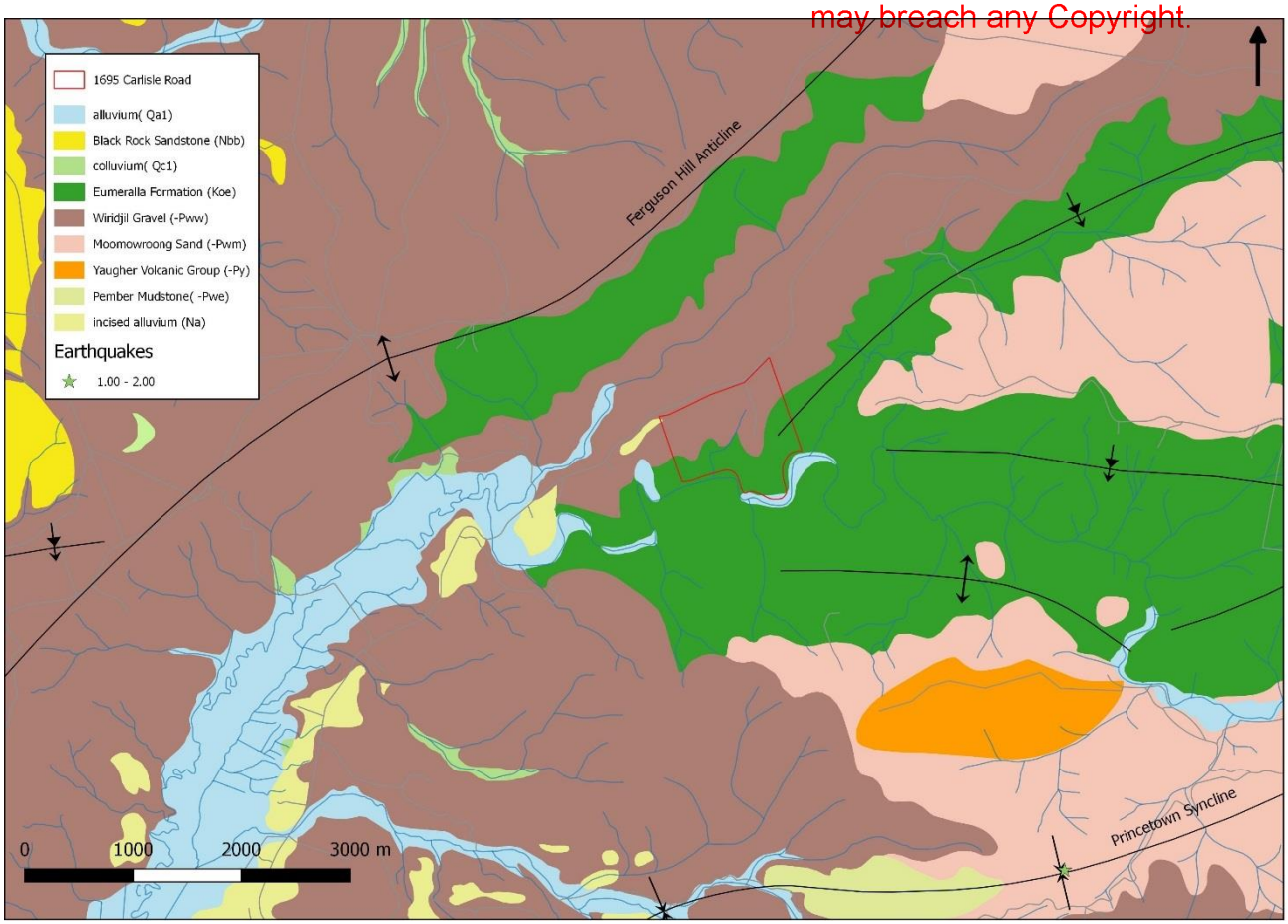


Figure 1: Regional geology of the greater Carlisle River area

4.1.2 Regional Landslide Factors

Landslides are rarely attributed to a single geomorphic factor alone and usually require a combination of factors to exist, often with equal bearing on the susceptibility of a site to landslide activity. Terrain slope, aspect and rainfall along with the geology and geomorphology are all factors which can have a profound influence on the occurrence of landslides. Landslide susceptibility mapping conducted by A.S. Miner Geotechnical (2006) in the Carlisle River area indicates that the site has a landslide susceptibility ranging from **Low to Moderate-High** across the property.

Slope angle has been attributed as a contributing factor in landslide occurrence (Cooney, 1980; Wood, 1980), although the steepest slope angles do not always pose the greatest risk.

The depth of weathering of a regolith profile can be related to slope aspect in the Otway Ranges and incised valleys of the Otway Ranges with deeper more weathered regolith profiles typically occurring on the wetter southwestern slopes. It is logical to assume some relationship between aspect and landslide activity although no direct correlation has been observed in previous studies.

Extreme rainfall is a dominant trigger for landslides in the Otway Ranges and previous studies locally, nationally and globally tend to confirm that intense or prolonged rainfall is the most common trigger of landslides in general.

Earthquakes attributed to active fault lines are another potential trigger for landslides in the Otway region. Intraplate earthquakes such as those experienced in Victoria are extremely unpredictable and occur unexpectedly. These types of earthquakes are caused by compressive stresses associated with thrust or reverse faults. Past research suggests that an earthquake of a Magnitude 4.0 or greater originating from relatively shallow depth would be required to trigger landslides.

Since 1955, there has been only a single earthquake recorded in Woolamai area within a 5km radius of the subject site and with recorded magnitude less of 1.1 originating from a depth of 13km occurring in 1984 (Figure 1). Other recorded earthquakes have occurred 12km to the north-east of site (magnitude 3, depth 32km) and 12.5km to the south-east near Ferguson (magnitude 2.6, depth 10km), probably related to movement on the Bambra Fault.

The Carlisle River and Gellibrand districts are located proximal to the Bambra Fault. It is feasible that a landslide triggering earthquake could occur in the region although recent data suggests these landslide triggering earthquakes are unlikely.

While not a direct triggering event itself, fire is also a significant factor contributing to an areas susceptibility to landslides. Steeply sloping areas burnt by fires may be subject to increased risk of landslide in the months and even years following the fire event, especially if the fire is followed by a prolonged wet season or high rain fall event. The shallow soil layers become more susceptible to erosion and potential landslides following fires for several reasons, including the removal of organic matter from the surface and upper soil layers which otherwise has a strong influence on soil structure. Drying and aeration of the soil structure following fire can weaken the shear strength of the soil making it more susceptible to failure given exposure to triggering events. When fires remove ground cover and lower storey vegetation, the root binding effects on soil structure are also removed. Fires expose bare soils to the impacts of surface run off and erosion without vegetation to bind the soils and intercept rain fall and surface water flow. A reduction in vegetation may also create medium to long term effects on soil moisture as the reduction in vegetation results in an increase in surface water infiltration and shallow sub-surface through flow. Increasing soil moisture (groundwater or surface infiltration) is a trigger of landslides.

Fires alter surface hydrology, especially in steep mountain catchments. The removal of vegetation from the landscape increases surface flow and run-off. Following fires, surface soils can also undergo chemical alteration and become hydrophobic. Hydrophobic soils contribute to surface run-off and increased surface flow velocity. High volume, high velocity surface run-off is one of the triggering factors of debris flows.

Other risk factors which may influence the initiation of landslides include unfavourable orientation of the rock strata, inherently weak rock mass, anthropogenic alterations to the slope morphology, hydrology and drainage.

Table 1 provides a general summary of some of the typical climatic and physiological features for the Soil Landform Unit 67 belonging to the Bunker Hill Land System of Otway Ranges which characterises parts of the Carlisle River and Gellibrand areas.

Table 1: Regional Features for Hills of the Soil Landform Unit 67

GEOMORPHIC UNIT	Dissected upland ranges of the Southern Uplands (3.2.2)				
LANDSCAPE	Deeply dissected hills abutting the Gellibrand River				
LANDFORM	Hills				
Geology	Paleocene unconsolidated sand, silt and clay		Lower Cretaceous sandstone and mudstone	Paleocene unconsolidated sand, silt and clay	
LANDFORM ELEMENT	Upper slope	Slope	Steep, lower slope	Gentle slope	Crest
ELEVATION	60-290m				
LOCAL RELIEF	95m				
SLOPE ANGLE AND RANGE (%)	20 (5-35)	30 (20-35)	45 (30-65)	15 (4-20)	13 (1-20)
SLOPE SHAPE	Convex	Convex	Linear	Concave	Convex
RAINFALL	900-1000mm Annual				
TEMPERATURE	12° Annual Average				

4.1.3 Previous Landslides Movements

Numerous landslide studies and geotechnical investigations have been previously conducted in the Gellibrand area. Cooney (1980), and Minor (2008) have both identified significant historical landslide failures from either aerial stereo photogrammetry interpretation or Lidar interpretation within the Carlisle River - Gellibrand area as can be seen in Figure 2.

The inventory records several medium sized landslide scarps located on the subject site as well as a large area of landsliding which exists in the south-eastern corner of the property and extends across neighbouring properties. The inventory also records numerous other large landslide bodies or areas of landsliding to the east and south-east of site. Most of the inventory records coincide with the presence of the Eumeralla Formation Otway Group sediments or the margins of the Wiridjil Gravel in contact with the Eumeralla Formation.

Figure 3 is a LiDAR derived Hill Shade DEM with interpreted landslide scarps. The Hill Shade DEM confirms the presence of historical landslides as depicted in the inventory record. Combining the known geological conditions with the presence of mapped and interpreted historical landslides, it is clear that steep, south facing slopes within Eumeralla Formation geologies are at high risk of slope instability.

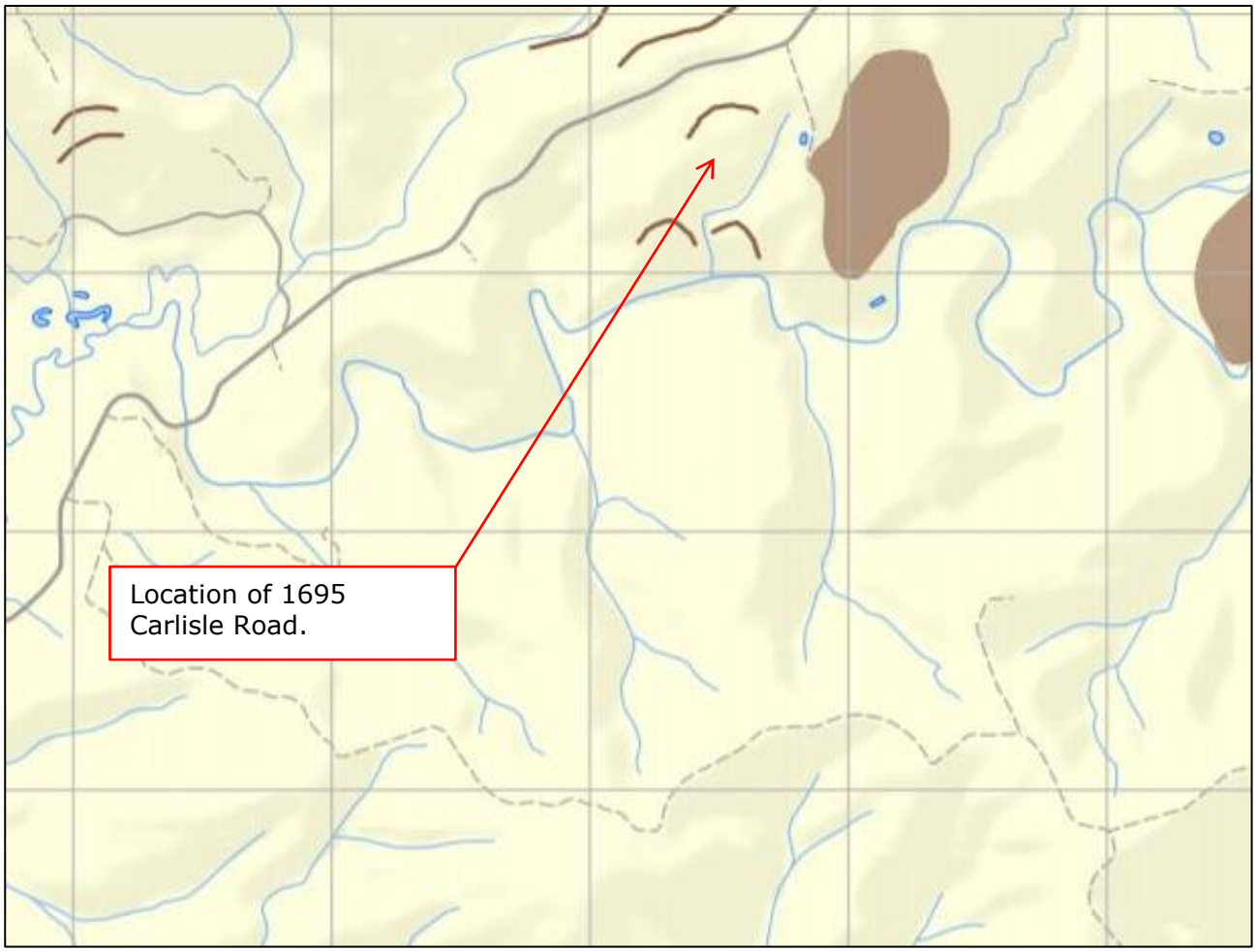


Figure 2: Previously recorded landslides on the landslide inventory (modified from AS Miner Geotechnical, 2007)

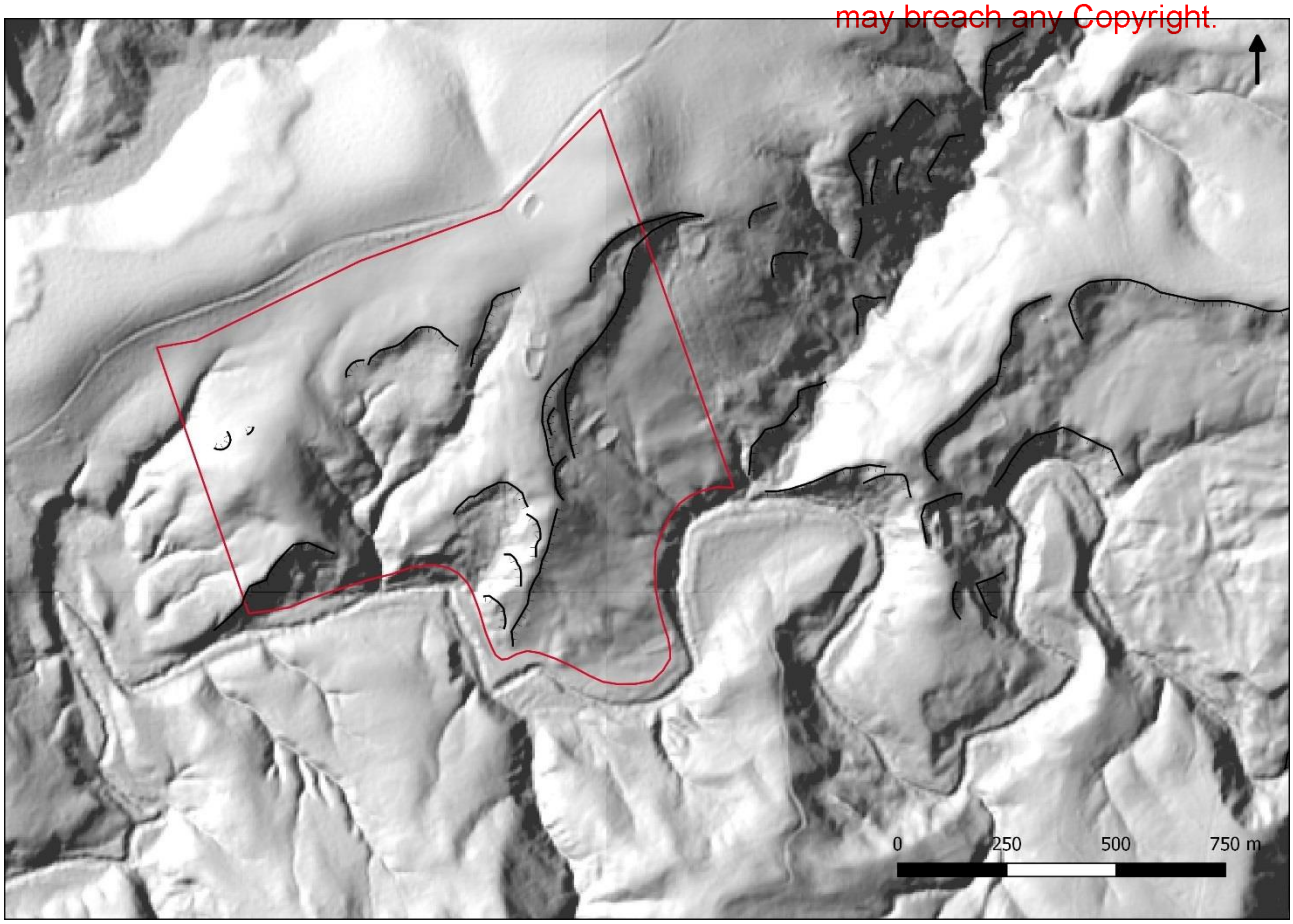


Figure 3: Hill Shade DEM interpretation of major landslides regional to the subject site (azimuth 300° illumination 45°)

4.2 FIELD INVESTIGATIONS

4.2.1 Site Inspection and Mapping

A thorough visual appraisal was made of the geomorphological features of the proposed development site and the surrounding area to search for evidence of slope instability and past slope failures. Slope angles were measured with a laser Forestry Range Finder and inclinometer and a Brunton geological compass.

A scaled engineering geology and geomorphology map showing the main features of the subject site is presented in Figure 4 while the local geological model is presented in cross-section in Figure's 5-7. Site photographs are also attached as Appendix III.

4.2.2 Site Description and Physiography

Development:

- Rural, 96.18 ha farming property containing existing farmhouse, shedding, stockyards, stock fencing and several farm dams.
- Most of the property consists of cleared grazing land with isolated trees. Some large sections of native forest occupy natural drainage lines, creeks and gullies.

Landscape position and Landforms:

- Located on the south side of Carlisle Road. The property has an easterly and south-easterly aspect and slope orientation.
- Along the northern property boundary the site consists of gently sloping upper slopes and ridge crests belonging to Paleocene Wiridjil Gravel geology.
- Isolated hill tops are located near the north-east and western boundaries.
- A south trending spur bisects the property through the centre. The spur has a broad convex crest and gently plunges to the south.
- The southern half of the property consists of steep, deeply dissected hillslopes, gullies and valleys slopes abutting the Gellibrand River along the southern boundary.
- Local relief is highly variable ranging from between 60-100m

Slopes:

- Natural slope angles on site range from 3° to 6° along the crest and upper Paleocene slopes (generally to the west), 11° to 15° on the flanks of the Paleocene hill tops and Otway Group slopes and as much as 20° to 33° over the steep valley and lower Otway Group hill slopes.

Slope shapes:

- Slope shapes across the property are variable, undulating from convex to concave across the north of the property to linear in the south.

Drainage:

- Highly variable drainage conditions depending on the landform, slope shape and landscape position within the property. Drainage conditions are good to fair on the hill tops and ridge crests and poor within concave depressions and saddles.
- Typically, moist to very moist surface conditions at the time of the investigation. Subsurface conditions are variable depending on the elevation and landscape position.
- Significant run off from the ridge crest and spur in the centre of the property. Run off is generally to the west and south west.

Observations and evidence of instability:

Evidence of instability and existing hazards are described below and annotated on the engineering geology map in Figure 4.

a) Soil creep. Small terrecettes.

b) Shallow, broad, drainage line.

c) Landslide; 35m wide. Hummocky, shallow translational earth slide – earth flow. Wet, concave slope with seeps and dense hydrophilic vegetation at the head of the slide. Located near geological contact and head of the major break in slope. Head scarp slopes at 19°; natural slope above landslide slopes at 10°.

d) Gully erosion, 35m long.

e) Gully erosion. Head retreat, gully widening and small localised slumping (2-3m wide).

f) Tunnel erosion. Collapsed tunnels and elongated depressions.

g) Landslide 20m wide by 18m long. Successive earth slide – earth flow with three sets of tension cracks open up to 200mm wide with up to 300mm vertical displacement. Toe bulge.

h) Medium to large landslide 200m wide and >300m long. Steep head scarp marked by major break in slope, concave body and convex hummocky toe.

i) Landslide. Subtle rounded features, older.

j) Hummocky ground surface and active soil creep. Minor terrecettes.

k) Hummocky ground surface at point of spur.

4.2.3 Sub-Surface Conditions

- The natural soil profile is greater than 3500mm thick on the gentle crest slopes of the Wiridjil Gravel.
- Natural soils consist of pale grey to dark grey, slightly moist, loose to medium dense, fine to medium grained, silty SAND with trace quartz gravels overlying an iron oxide cemented ferecrete;
- Sub-soils beneath the ferecrete consist of a pale yellow-brown and mottle grey sandy CLAY, slightly moist, stiff and of low plasticity with trace medium grained, sub-angular quartz gravels. Clay grades silty with depth and grades more plastic.
- The underlying geology encountered is consistent with that of the Paleocene Wiridjil Gravel referenced in published geological maps and exposed in cuttings along Carlisle Road.
- The composition of the upper soil layers along the northern property boundary on the gentle crest slopes indicates the natural soils are interpreted as being in-situ and not belonging to transported colluvial debris.
- Soils on the steep slope in the south of the property have not been directly investigated.

Full subsurface descriptions can be observed in the logs for Test Site 1 in Appendix IV.

Borehole locations are provided in Figure 4.

4.2.4 Geological Structure

A lack of geological structure prevented structural mapping during this investigation.

- Terrestrial sediments of the Wiridjil Gravel are inferred to gently dip to the south-east.
- The subject site is located south of the regional Ferguson Hill Anticline and proximal to regional monoclines dipping towards the south and south-east.
- Structural measurements made in the Eumeralla Formation collected by the Geological Survey of Victoria along the Ferguson Anticline to the south-west infer a regional dip direction to the south-east.

4.2.5 Groundwater Conditions

- Soil conditions were generally considered slightly moist.
- Mottling was observed within soil profile suggesting imperfectly drained conditions.
- Surface water and shallow groundwater seeps were observed in numerous locations across the property at concave breaks in slope.
- Depth to water table mapping is highly variable depending on the landscape position. The inferred water table is <5m from deep around the Gellibrand River and tributary gullies, 10-20m deep over hill slopes and 50m deep along the ridge and spur crests.
- Groundwater exists as an intermediate and sub-dominant local flow system within the Wiridjil Gravel formation and as a local flow system within the Otway Group sediments. Groundwater provides baseflow discharge to the Gellibrand River with a moderate to high hydraulic gradient.

4.2.6 Existing Retaining Walls, Excavations, Embankments, Cuts/Fills

- No retaining walls or site cuts exist on site.

4.2.7 Existing Vegetation

- Large portions of the site have been cleared of vegetation for stock grazing.
- Large sections of native forest exist within the steeper lower hill slopes, valley slopes and gullies leading down to the Gellibrand River.
- Ridge and spur crests, isolated hill tops and crest slopes are cleared of vegetation.

4.2.8 Features of Adjacent Sites

- The site is surrounded by similarly sized rural properties covered in forest vegetation and minor plantation.
- The Gellibrand River is located along southern property boundary.
- The nearest identified off-site landslide is located to the east approximately 500m from the eastern property boundary.
- Steep, deeply dissected, hilly country typifies the landscape to the south.

4.3 SUMMARY of GEOLOGICAL MODEL

- Considering the geomorphology of the site and the surrounding area, the geological model formed implies that the soil profile on site has formed in-situ from weathering of the Wiridjil Gravel across the north of the property. Transported colluvial soils are inferred on crest and hill slopes in various locations and within the forested centre of the property.
- The soil profile is greater than 3500mm thick.

- Bedrock was not observed during this investigation however regional bedrock structures indicate the property lies within regional monoclines on the southern limb of the Ferguson Hill Anticline.

- The local ground model for landslide hazards involves shallow and deeper-seated translational earth-slides and earth flows on the margins of the Wiridjil Gravel, on steeper hill slopes and on the steep, south facing lower hill slopes of the Eumeralla Formation north of the Gellibrand River.

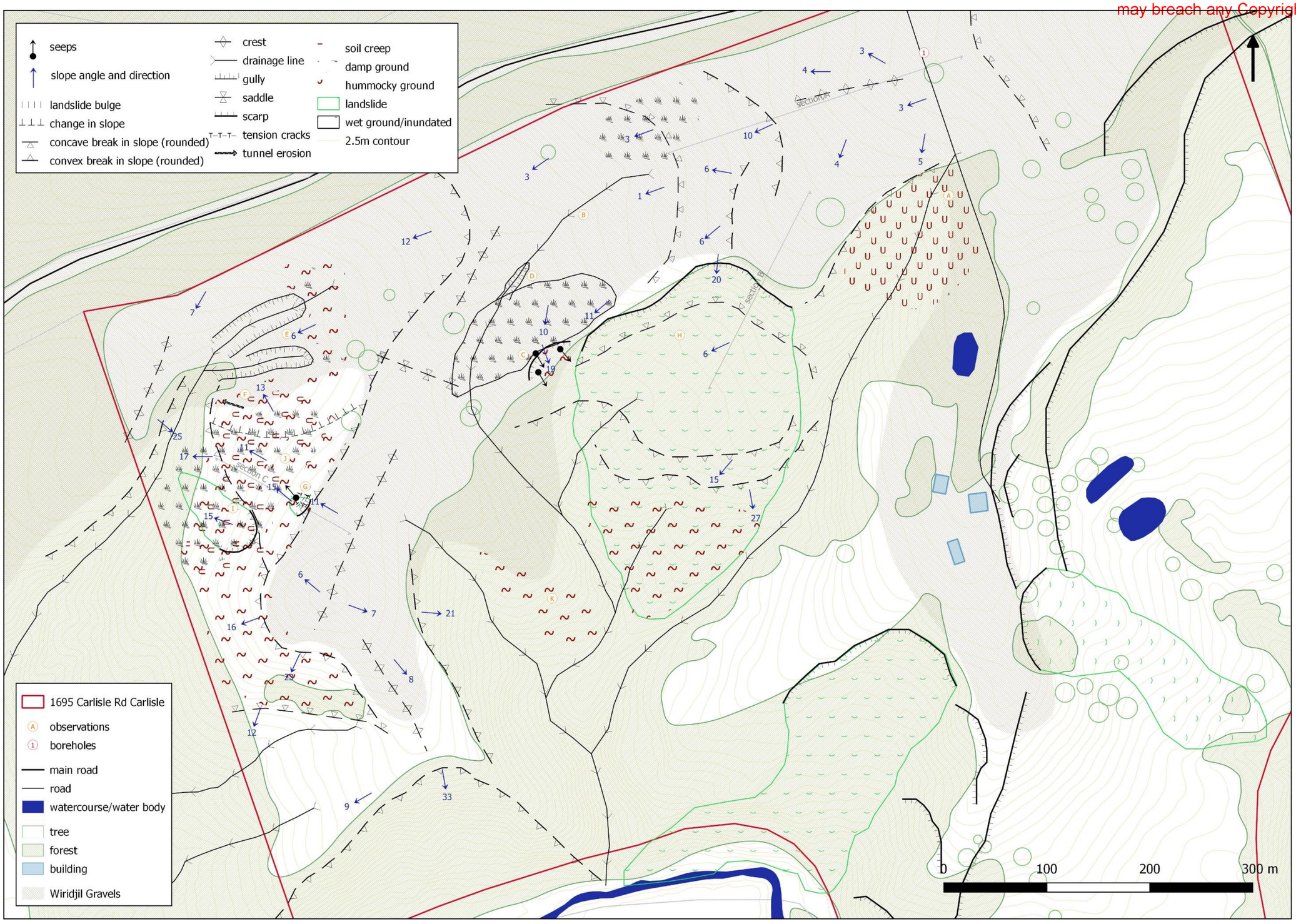


Figure 4: Engineering Geology and Geomorphology of 1695 Carlisle Road.

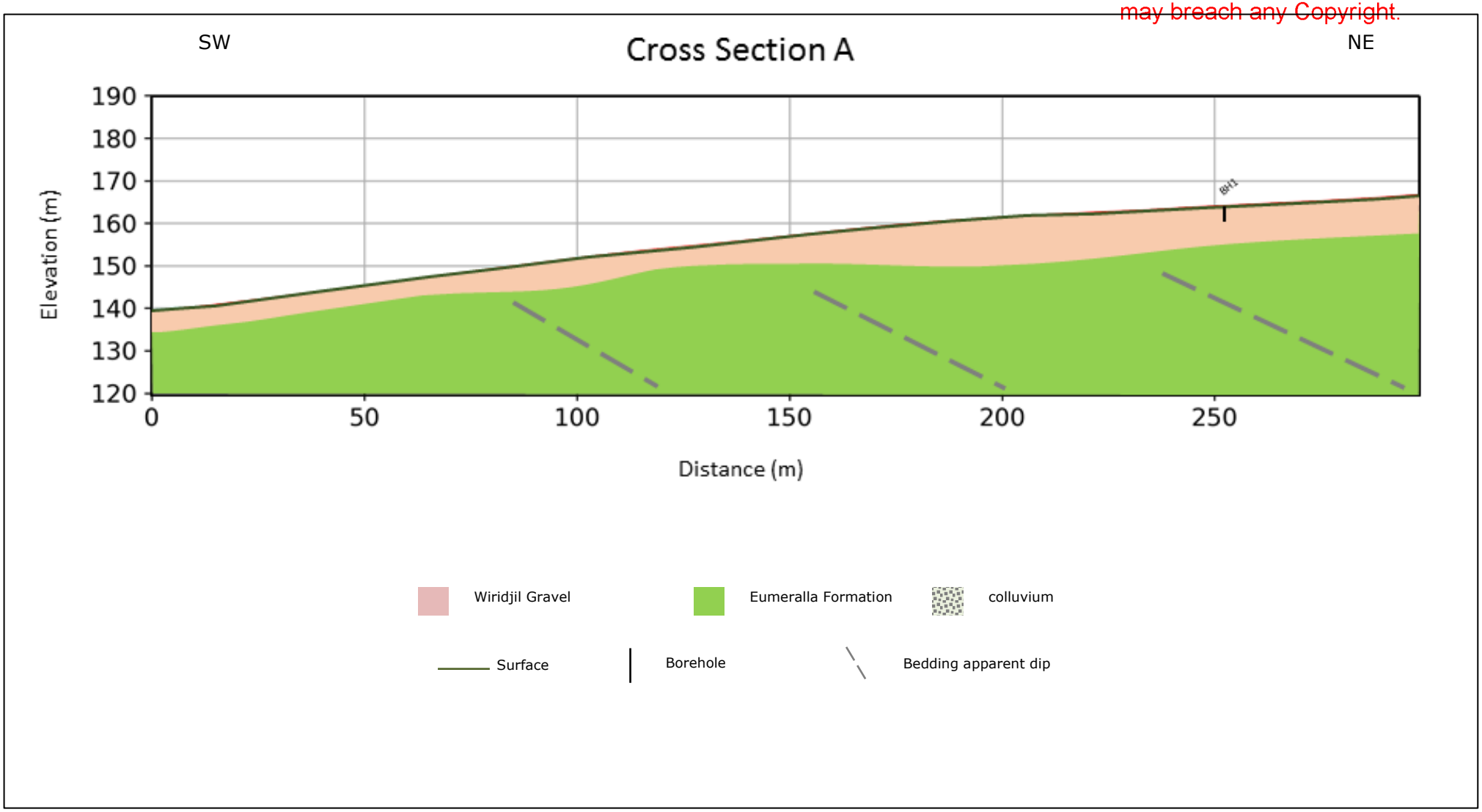


Figure 5: Cross-section A representing the local geological model

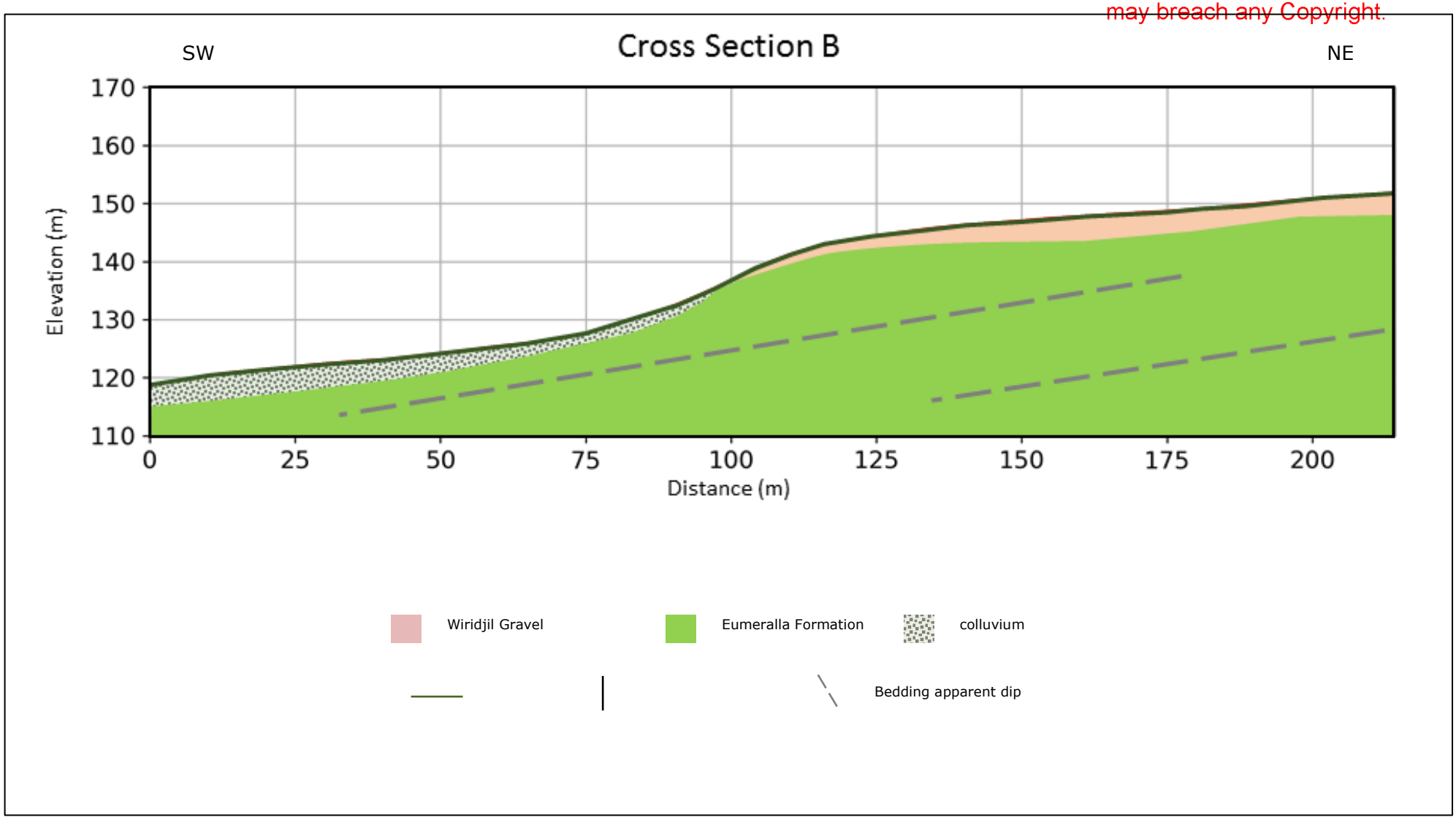


Figure 6: Cross-section B representing the local geological model

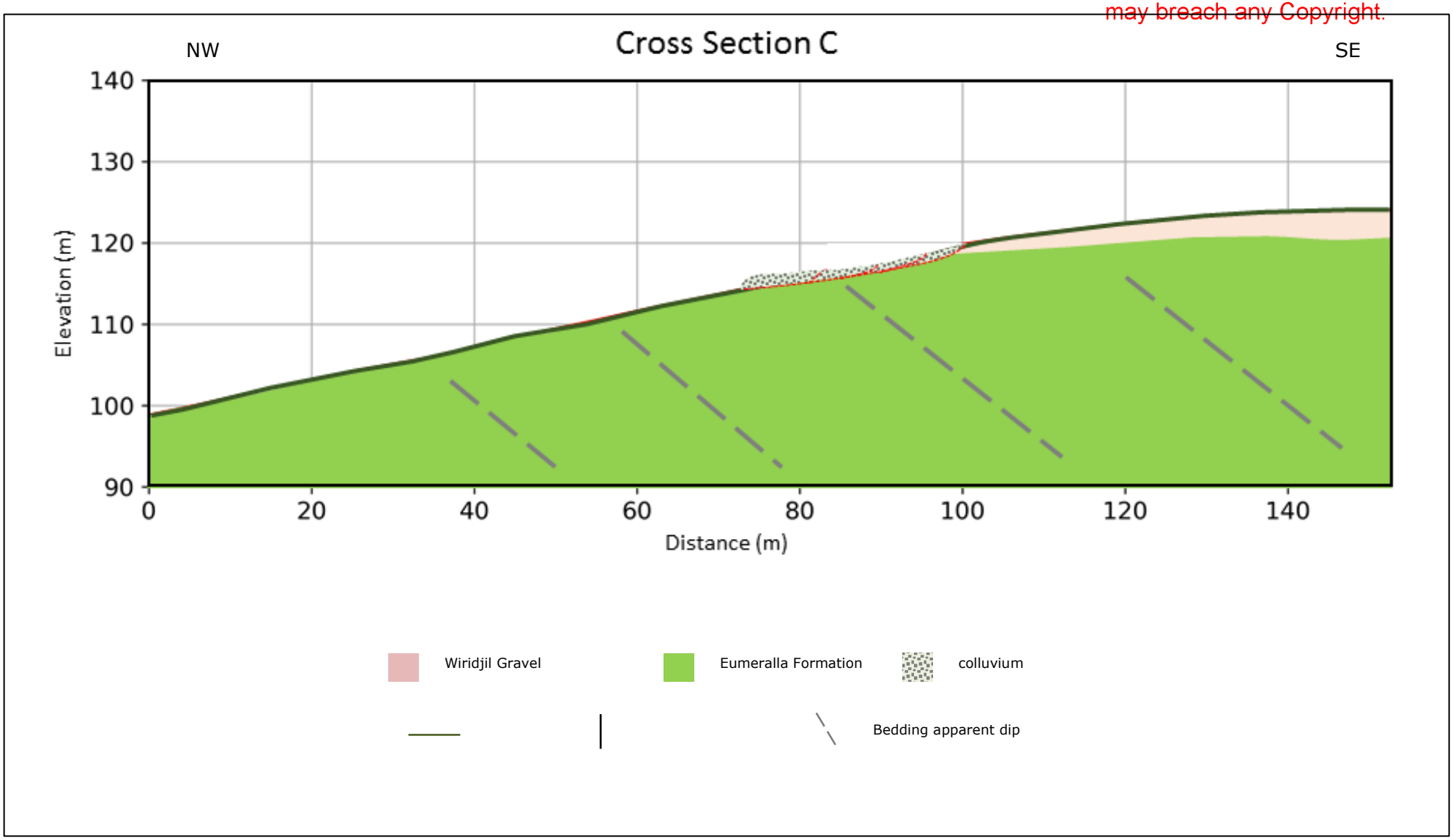


Figure 7: Cross-section C representing the local geological model

4.4 HAZARD IDENTIFICATION

The following **possible** hazards which **may** affect the element at risk are:

HAZARD A. SHALLOW TRANSLATIONAL EARTH SLIDE ON MARGINS OF CREST SLOPE
HAZARD B. SMALL ROTATIONAL EARTH SLIDES ON STEEP HILL SLOPES
HAZARD C. DEEP SEATED TRANSLATIONAL DEBRIS SLIDE – DEBRIS FLOW ON STEEP HILL SLOPES
HAZARD D. SHALLOW TRANSLATIONAL EARTH SLIDE – EARTH FLOW ON HILL SLOPES

Hazard A. Shallow translational earth slide on margins of crest slope

- Small, shallow, translational earth-debris slide. Successive movement in slices. Estimate up to 20m wide by up to 25m long. Travel distance may be up to 1m.
- Fast or slow moving.
- Unconsolidated SAND and clays of Wiridjil Gravel soil profile with low to moderate internal friction angles and low to moderate drained effective cohesion in at contact with residual Otway Group soils (clayey SILT and high plasticity silty CLAY).
- Mechanism for failure: Translational sliding and internal shearing of weakened or softened soil layer where competency contrast exists in profile (often at geological contact). Potential to become fluid and flow down slope after initial sliding failure.
- Triggered: Intense rainfall, high infiltration, high volume, high velocity run on and seeping surface water.

Hazard B. Small rotational earth slides on steep hill slopes

- Small, rotational earth slide. Estimate up to 5-10m wide by up to 15m long. Travel distance may be up to 1m.
- Fast moving, instantaneous failure.
- Highly weathered residual silts and highly plasticity clays of Otway Group sediments with moderate to low shear strength and low to moderate friction angles. Highly erodible.
- Mechanism for failure: Rotational sliding related internal shearing of cohesive, unconsolidated, moderate to low shear strength clay.
- Trigger: Increasing pore water pressure due to seeping groundwater and surface water infiltration from prolonged heavy rainfall.

Hazard C. Deep seated translational debris slide – debris flow on steep hill slopes

- Possible regression of existing landslide scarps.
- Deeper seated translational earth slide of residual Otway Group soils. Estimate 30-50m wide by between 50-100m long. Travel distance may be up to 5-10m.
- Failure may develop quickly or very slowly. Movement likely to be slow to fast in a single event. Horizontal displacement may be expected between 1-2m.
- Mechanism for failure: Sliding along a fully softened plane of weakness which may develop where a well-defined competency contrast exists between residual soils and underlying weathered bedrock. Potential to become fluid and flow down slope after initial sliding failure.

- Trigger: Induced by stress release on the slope and rebound of new cuttings; prolonged, above average rainfall resulting in groundwater through flow or seepage along soil/rock interface developing a softened plane of weakness and preferential slip surface and increase pore water pressure. May also be triggered by earthquake. May become fluid if trigger is earthquake.

Hazard D. Shallow translational earth slide – earth flow on hill slopes

- Small, shallow, translational earth-debris slide. Successive movement in slices. Estimate up to 20m wide by up to 30m long. Run out distance maybe up to 30m.
- Fast moving.
- Highly weathered residual silts and highly plasticity clays of Otway Group sediments with moderate to low shear strength and low to moderate friction angles. Highly erodible.
- Mechanism for failure: Initial translational sliding and internal shearing of weakened or softened soil layer where competency contrast exists in profile (often at geological contact) followed by fluid flow flow down slope after initial sliding failure.
- Triggered: Rapid increase in pore water pressure caused by intense rainfall, high infiltration and high volume, high velocity run on.

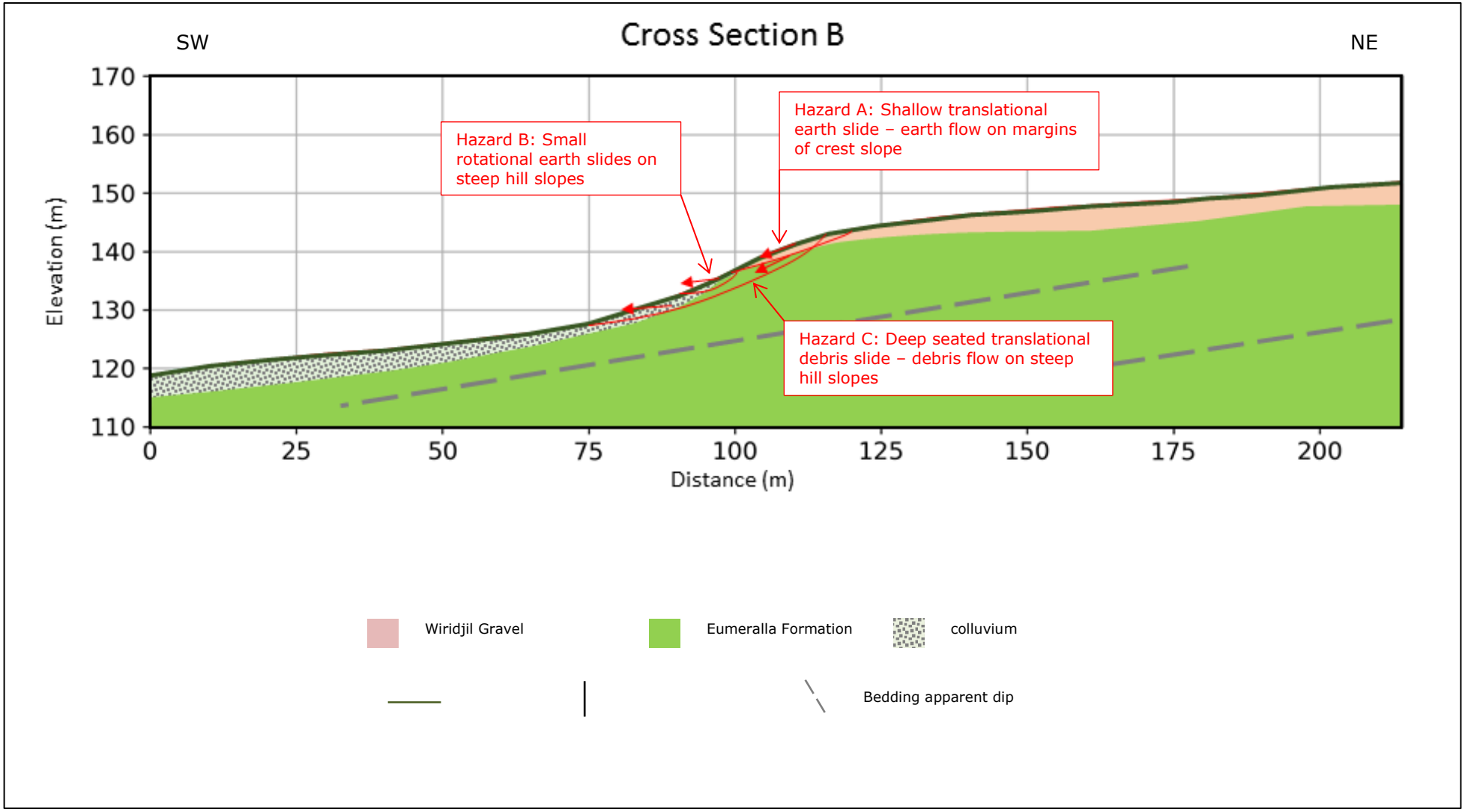


Figure 8: Cross-section B representing the local geological model

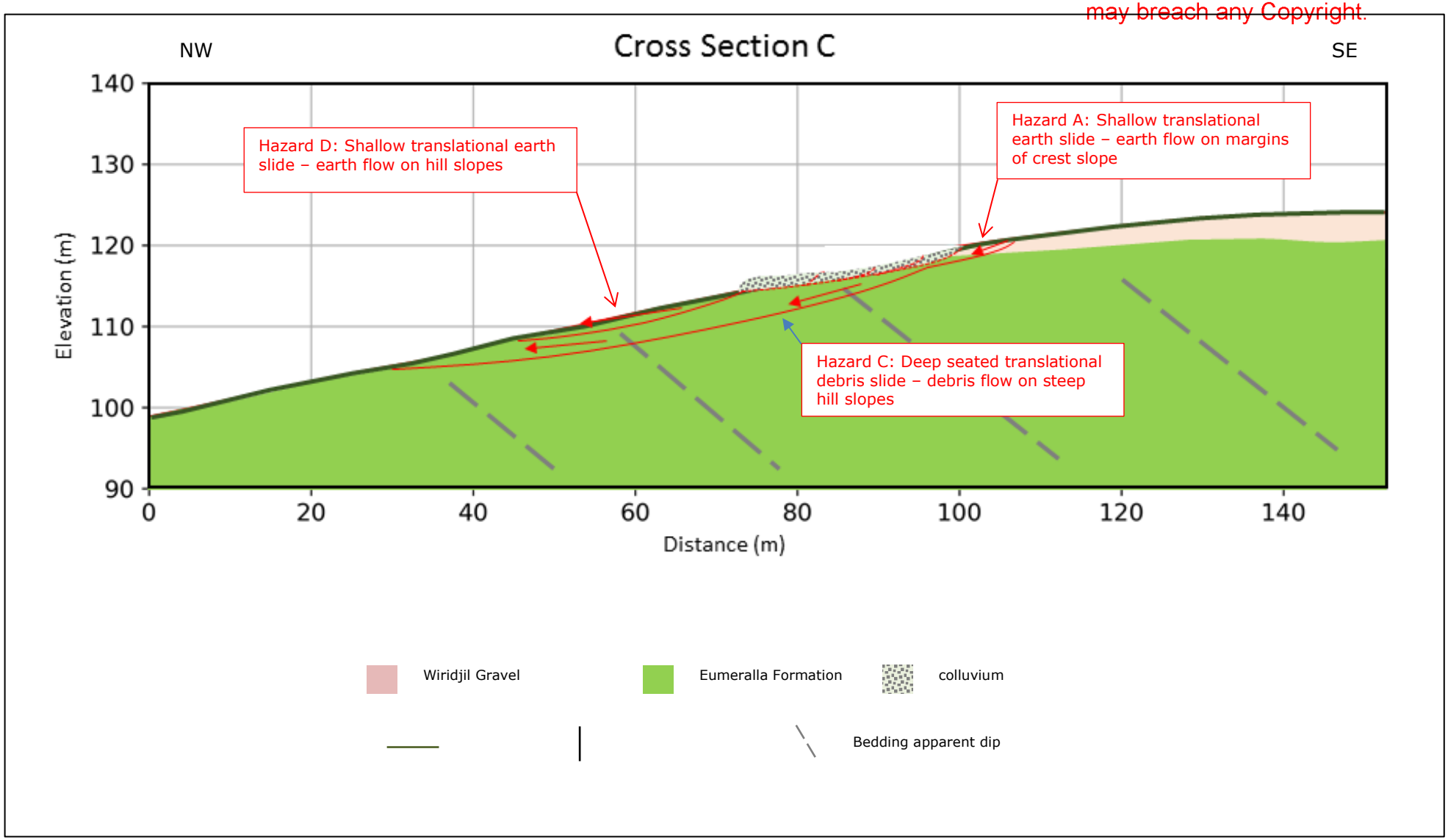


Figure 9: Cross-section C representing the local geological model

5.0 SUMMARY OF RISKS AND CONCLUSION

Our assessment has found that there are areas on this property where slope instability or landslide hazards may pose greater than an ACCEPTABLE risk to life and property if developed. There are however substantial areas of the property where slope instability and landslide risk are considered negligible and can achieve an ACCEPTABLE risk level and may be suitable for future development.

Based on our assessment, we conclude that there is sufficient land on the subject site that can achieve an ACCEPTABLE risk level with respect to any future development that the proposal for subdivision may be considered. In these areas an ACCEPTABLE risk level can be achieved for future development and can remain so over the design life of any development (50 years).

We conclude that a detailed Landslip Risk Assessment is not warranted and that there are no geotechnical reasons to prevent the issue of a permit for the proposed subdivision subject to the subject to the recommendations in Section 6.0.

Subsequent proposals for development may however require a Landslip Risk Assessment to be undertaken dependant on the location and nature of the development proposal.

The following recommendations outline management strategies that can reduce or maintain the likelihood and/or consequences relating to landslide hazards and provides guidance on the areas considered suitable for future development.

6.0 RECOMMENDATIONS FOR RISK MANAGEMENT

It is not feasible to remove all of the risks to property damage on the site but the risks can be reduced by good engineering design, by following good hillside construction practices and by regular and frequent site maintenance. The following recommendations outline general good building practice and property maintenance for steep slopes and landslide prone areas.

6.1 SITE RECOMMENDATIONS

Large areas of the subject site either exhibit signs of existing slope instability, exiting or historical landslides or susceptible landslide conditions. These areas (area marked as *exclusion zone* in Figure 10) should be excluded from all future development. The excluded area is considered unsuitable for any future structural development.

The 6 ha area marked as *Acceptable* in Figure 10 is the portion of the proposed subdivision assessed as being able to achieve an ACCEPTABLE risk level and suitable for future development. All other areas (including the excluded zone) should only be considered for development subject to the findings of a detailed Landslip Risk Assessment conducted by a suitably qualified person with experience in slope stability.

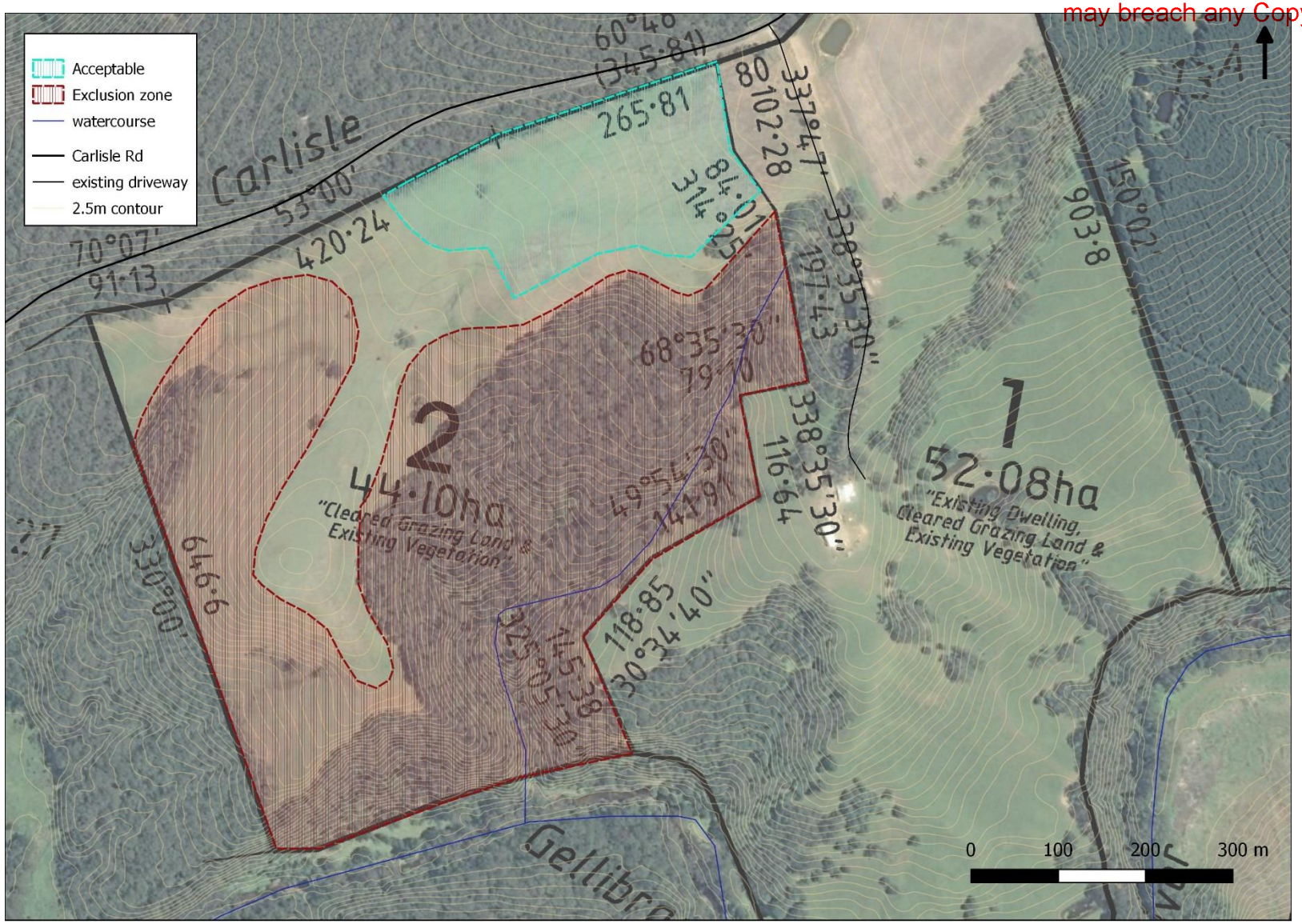


Figure 10: Recommended development zones

6.2 FOOTINGS

Future developments shall be subject to a Site Classification assessment and footing recommendations may only be provided for specific proposals subject to their intended location, building design and individual soil conditions.

Having all footings appropriately designed and founded will reduce the risk of damage due to soil movement or slope failures.

6.3 SITE EXCAVATIONS, CUT AND FILLS AND RETAINING STRUCTURES

It is recommended any new site excavations should be kept to a minimum and retained regardless of height unless battered at an appropriate safe shallow angle. All excavations equal to or greater than 1000mm must be supported by engineer-designed retaining walls with appropriate drainage features or battered at an appropriate safe shallow angle.

In order to ensure adequate stability of filled or excavated slopes in the short term (i.e. 2 consecutive days, in fine weather) the following maximum batters should be adopted.

Table 2: Temporary Batter Angles

SOIL TYPE	MAXIMUM TEMPORARY SLOPE (To Horizontal)
Topsoil (clayey silts, silty sands, clayey sands)	45° or 1(V):1(H)
Subsoils (clay, sandy clay, silty clay)	45° or 1(V):1(H)
New or existing fill	45° or 1(V):1(H)
Highly weathered to fresh rock[1]	60° or 2(V):1(H)

All excavations should be inspected to ensure that stability is adequate and to identify any possible zone of instability e.g. unfavourable jointing, fault zones, fissures. The stability of vertically excavated slopes, e.g. for the insertion of precast panels, cannot be guaranteed.

If poor weather conditions are encountered (i.e. heavy rain, etc.) at the time of excavation or panel insertion, immediate shoring of the batters should be carried out.

Permeable soils that become inundated may lose form. If excavations are undertaken during wet periods a shoulder to shoulder pile system may be required **or** a proven diversion drainage system may need to be installed prior to site works.

Any fill introduced to the site should contain little or no organics and be placed in layers up to 200mm thick with each layer being well compacted at the appropriate moisture content. All permanent fill batters or cuts in natural soils must not exceed slope angels 27° or 1(V):2(H) or alternatively be retained by engineer designed retaining walls with appropriate footings and drainage works.

In order to ensure adequate stability of filled or excavated slopes in the long term the following maximum batters should be adopted.

[1] Steeper angles maybe possible in some less weathered rock depending on the nature of the geological structure, but would require site specific assessment during excavation by an experienced geotechnical professional.

Table 3: Permanent Batter Angles

SOIL TYPE	MAXIMUM PERMANENT SLOPE (To Horizontal)
Topsoil (clayey silts, silty sands, clayey sands)	27° or 1(V):2(H)
Subsoils (clay, sandy clay, silty clay)	27° or 1(V):2(H)
New or existing fill	27° or 1(V):2(H)
Highly weathered to fresh rock	45° or 1(V):1(H)

All cut and fill batters should be revegetated with fast growing deep rooted plants as soon after construction as possible to protect the batter face.

Care must also be taken to ensure that any levelled areas have a slight fall to prevent surface water from ponding or seeping into the ground near the base of any site cut. The construction of appropriately designed walls or battered slopes will reduce the risk of soil movement and the collapse of any proposed site excavations.

For engineered retaining wall design the following geotechnical parameters are judged to be typical values for the types of ground materials present on site within the *Acceptable* development area.

Table 4: Typical Geotechnical Parameters

	silty SAND[2]	SAND[3]	clayey SAND[3]
Wet or total unit Weight (γ_w)	20 kN/m^3	21 kN/m^3	21 kN/m^3
Effective Peak Friction angle (Φ'_{peak})	36°	45°	40°
Effective Critical Friction angle (Φ'_{crit})	30°	36°	32°

6.4 VEHICLE PARKING AND ACCESS

It is recommended that suitably designed drainage accompany any design of access ways to minimise surface water run-off and overland flow. It is recommended that some consideration be given to a drainage system for the track adjacent to the south side of the solar array cutting which may include the use of a spoon drain and culvert system as part of the overall drainage design. Surface water is discharged must not be allowed to run over the face of the cutting and should be dispersed so that surface water cannot run-off down slope and over any steep embankments.

6.5 SITE DRAINAGE

Many researchers identify intense rainfall and/or poor site drainage as a common trigger of landslide events. Whilst nothing can be done to reduce the likelihood of intense rainfall in the Apollo Bay area, steps can be taken to improve site drainage and minimise saturation of the soil layers which often triggers soil movement. Careful attention to drainage is essential to reduce the landslide risk and surface water must therefore be prevented from ponding anywhere on the site.

We recommend that the drainage system for any future development sites be fully engineer designed. We expect that the roof run-off will be collected in tanks and that overflows should discharge excess water in a non-destructive way to an approved point of discharge such as a road side spoon or table drain or into a natural watercourse. Discharge must be made well away from any buildings to an area where the water can be dispersed without causing erosion or accumulating

[2] Loose to medium dense, moderately graded
[3] Dense to very dense, well graded

in a concentrated area. It is very important that roof run-off is not allowed to run onto the ground near the buildings.
An open surface spoon drain should be established on the high side future developments. The drain must be positioned and constructed with sufficient fall to discharge completely to prevent water from accumulating in the soil anywhere near buildings. The drain must be well maintained and any blockages must be cleared promptly.

Where the soil surface is altered to construct vehicle parking bays, recreation areas etc., then precautions must be taken to ensure excess surface water cannot pond or soak into the ground but is diverted away from the buildings.

Careful attention to site drainage will reduce the risk of slope failures or soil movements.

6.6 SITE VEGETATION

Suitable vegetation contributes greatly to the stability of a site by reducing the soil moisture content, minimizing soil erosion and binding the soil structure together. Existing trees should remain unless they interfere with the building or the minimum defendable space for fire protection in which case they should be cut off at ground level and the root structures left intact.

We recommend that a re-vegetation program be implemented for the north-west facing slopes above the gully in the north-west of the property. Suitable deep-rooted trees and shrubs should be established across the slopes to assist the overall slope stability.

Revegetation of the site will provide root-binding effects, help mitigate excess moisture building up in the soil profile, increase suction and assist with rainfall and surface flow interception to reduce the velocity of overland flow in turn reducing the risk of slope failure and erosion.

6.7 EFFLUENT DISPOSAL

Effluent should be disposed of offsite where reticulated mains sewer is available.

If onsite waste water treatment is required then it should, where possible, be widely dispersed by subsurface irrigation well away from any development area to minimise the likelihood of wastewater concentrating in the soil profile. Suitable vegetation will assist with evapotranspiration.

6.8 EROSION

Gully and tunnel erosion are active erosional identified on site. These areas require revegetation and remediation to minimise undesirable land degradation encroaching into productive farmland.

Vegetation adds organic material back into the soil, improving soil structure and binding the topsoil layers. Surface vegetation and low shrubs also intercept surface water runoff and slow the rate of surface flow thus minimising the physical impact of surface water runoff across sloping sites.

Additional measures to help prevent erosion caused by surface water include implementing good drainage design to capture surface water runoff and using surface berms, vertical drops and energy dissipaters within the landscape to reduce the velocity of runoff down slope.

Remediation of existing tunnels requires deep cross ripping of the tunnels to below the base of tunnel development (400-600mm) and soil amelioration with gypsum at a rate of approximately 1kg/m^2. Gypsum adds bi-charged calcium ions to the soil which acts as a flocculating agent helping soil particles to clump together and aggregate, displacing singularly charged sodium ions which lead to high soil dispersibility and potential soil erosion.

Remediated tunnel areas should be re-vegetated with deep rooted trees and shrubs and dense native ground cover vegetation. Up to 100mm of non-dispersive topsoil should be introduced to the site for revegetation. Vegetation should not be planted directly into the pre-existing dispersive soil.

Areas afflicted with existing should be re-profiled to create shallow stable batters of around 27° (2H:1V). Re-profiled gully banks should be revegetated and channels lined with natural debris or rock to slow the rate of surface flow through the gully system.

Larger gullies may benefit from the construction of check dams for grade and sediment control at regular intervals down the gully to further mitigate and control erosional processes. Check dams control and reduce the velocity of stream flow through the gully system and act as sediment traps within the gully, adding to the natural gully development stages of erosion and deposition.

6.9 GENERAL RECOMMENDATIONS

The satisfactory performance of buildings on this site depends on good engineering and building practice. This includes:

a) the design of an appropriate development for the site;

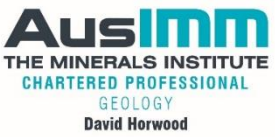
b) the provision of adequate retaining structures and drainage for all cut faces (or batter at an appropriate angle);

c) adequate site drainage is essential, surface water and excess roof water must not be allowed to pond or seep into the ground near buildings.

d) regular maintenance of open drains.

Refer also to the attached Appendices for more general advice

DAVID J HORWOOD
BAppSc (Geology); MAusIMM CP (Geo); MAIG
SENIOR ENGINEERING GEOLOGIST



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Appendix I: Site Plan

PLAN OF PROPOSED SUBDIVISION
CROWN ALLOTMENT 13B
PARISH OF NATTE MURRANG
COUNTY OF POLWARTH
RE: G. & L. TOUSSAINT
SCALE 1:7500 (Original Sheet Size A3)

ROD BRIGHT & ASSOCIATES PTY LTD
LICENSED SURVEYORS & TOWN PLANNERS
26 MURRAY STREET COLAC 3250
TEL 5231 4883 ACN 007 206 975

NOTE:
Certain dimensions shown hereon are subject to survey.
Certain areas shown hereon are subject to survey.
Land contained within C/T Vol. Fol.

Existing Conditions Diagram

Appendix II: Site Photographs

Photo1: Overview of the *Acceptable* area looking west.

Photo2: View to the north along the crest near the existing driveway.

Photo3: Existing small landslide north of the forested areas centre of the property.

Photo4: Developming gully erosion in the centre of the property.

Photo5: Tunnel erosion in the north-western corner of the property.

Photo6: Active successive landslide on north-west facing slopes below hill top in north-west corner of the property.

Appendix III: Borehole Logs

Client:	Guy & Lauren Toussaint	Bore Hole	No. 1	Drilling Medthod:	
Project Address:	1695 Carlisle Road Carlisle River	Field Work Completed By:	DH	Continuous Flight Auger	
Reference No:	19I429GTA	Field Work Date:	4.10.2019	From 0	To 3500

Depth mm	Graphic Log	Group Symbol	Material Description			Shade	Colour	Moisture	Consistency/ Density	Field Test
100			silty SAND		fine-med grained		Bk	M	L	
200										
300						Dk	Gy	SM	MD	
400										
500			trace quartz gravels		medium grained	Pl	Gy	SM	MD	
600					sub angular		Br			
700			ferecrete			Pl	Or/ Br	D	D	
800			sandy CLAY		low plasticity	Pl	Yl/ Br, mott Gy	SM	St	
900										
1000			trace quartz gravels		medium grained					
1100					sub angular					
1200								M	St	
1300										
1400										
1500										
1600										
1700										
1800										
1900										
2000										
2100										
2200			silty CLAY		med-high plasticity	Pl	Gy	M	VSt	
2300				trace	quartz pebbles					
2400					sub angular to sub round					
2500										
2600										
2700										
2800										
2900										
3000				increasing	resistance	Pl	Gy/ Br	SM	H	
3100										
3200										
3300										
3400										
3500			EOH							

Comment:

Graphic Log — Granular A Horison; Cohesive A Horizon; Cohesive B Horizon; Granular B Horizon; EW Rock/C Horizon; Rock; Fill

Field Test and Sampling	Moisture:	Relative Density:	Consistency:
SPT Standard Penetration Test (Relative density N - blows/300mm)	D Dry	VL	VS Very Soft
PP Pocket Penetrometer (Force kgf/cm^2 - Unconfined Compressive Strength q_u,)	SM Slightly Moist	L	S Soft
VS Vane Shear (Undrained cohesive (shear) strength Cu/Su kPa)	M Moist	MD	F Firm
DCP Dynamic Cone Penetrometer (Penetration resistance N_p - blows/100mm)	VM Very Moist	D	St Stiff
Disturbed Sample D Undisturbed Sample U	W Wet	VD	VSt Very Stiff
Compaction: PC Poorly Compacted MC Moderately Compacted WC Well Compacted VC Variably Compacted		Groundwater	H Hard
Colour: Dk Dark Pl Pale Bk Black Br Brown Gy Grey Or Orange Yl Yellow Re Red Bl Blue Gn Green Pk Pink Wh White		▼	

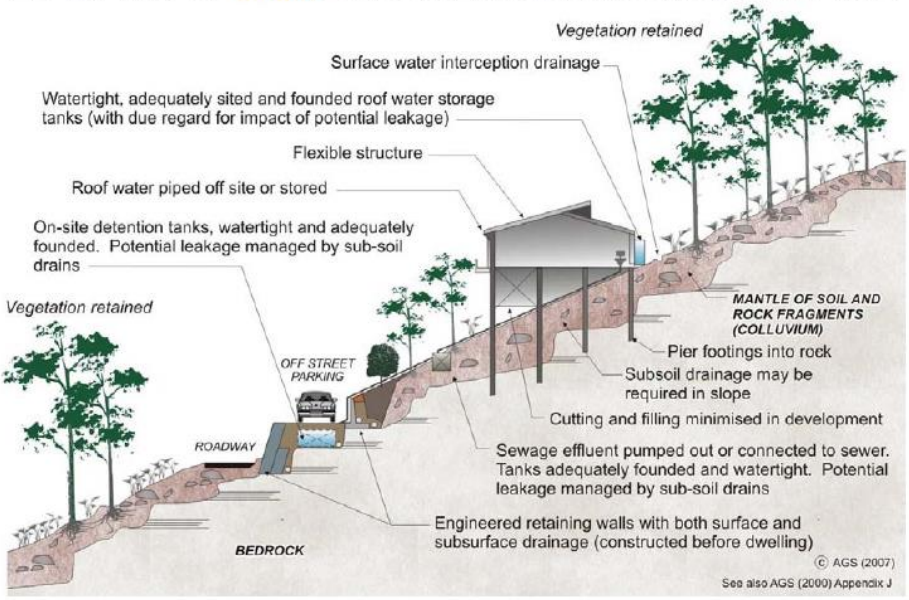
Appendix IV: Hillside Construction Practice

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.

EXAMPLES OF GOOD HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

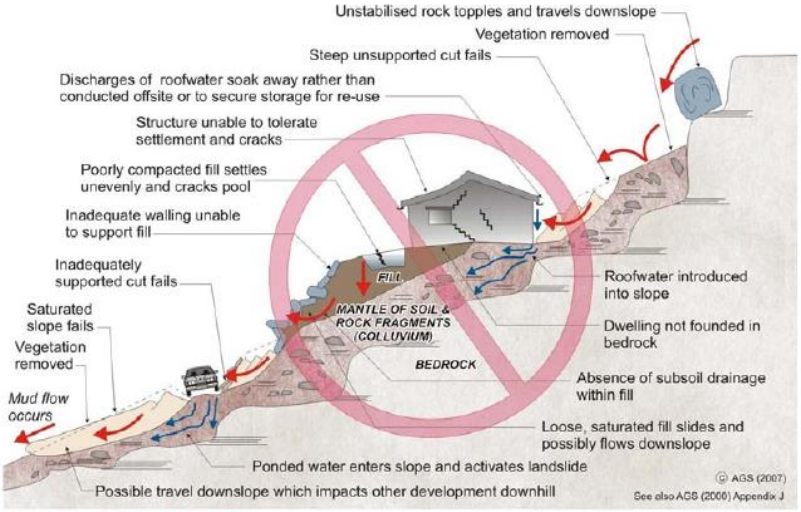
Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

174 Australian Geomechanics Vol 42 No 1 March 2007

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

APPENDIX C: LANDSLIDE RISK ASSESSMENT

QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

QUALITATIVE MEASURES OF LIKELIHOOD

Approximate Annual Probability		Implied Indicative Landslide Recurrence Interval		Description	Descriptor	Level
Indicative Value	Notional Boundary					
10^{-1}	$5x10^{-2}$	10 years	20 years	The event is expected to occur over the design life.	ALMOST CERTAIN	A
10^{-2}	$5x10^{-3}$	100 years	200 years	The event will probably occur under adverse conditions over the design life.	LIKELY	B
10^{-3}	$5x10^{-4}$	1000 years	2000 years	The event could occur under adverse conditions over the design life.	POSSIBLE	C
10^{-4}	$5x10^{-5}$	10,000 years	20,000 years	The event might occur under very adverse circumstances over the design life.	UNLIKELY	D
10^{-5}	$5x10^{-6}$	100,000 years	200,000 years	The event is conceivable but only under exceptional circumstances over the design life.	RARE	E
10^{-6}		1,000,000 years		The event is inconceivable or fanciful over the design life.	BARELY CREDIBLE	F

Note: (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not *vice versa.*

QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY

Approximate Cost of Damage		Description	Descriptor	Level
Indicative Value	Notional Boundary			
200%	100%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.	CATASTROPHIC	1
60%	40%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.	MAJOR	2
20%	10%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.	MEDIUM	3
5%	1%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.	MINOR	4
0.5%		Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)	INSIGNIFICANT	5

Notes: (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.

(3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.

(4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not vice versa

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

APPENDIX C: – QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY (CONTINUED)

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)				
	Indicative Value of Approximate Annual Probability	1: CATASTROPHIC 200%	2: MAJOR 60%	3: MEDIUM 20%	4: MINOR 5%	5: INSIGNIFICANT 0.5%
A – ALMOST CERTAIN	10^{-1}	VH	VH	VH	H	M or L (5)
B - LIKELY	10^{-2}	VH	VH	H	M	L
C - POSSIBLE	10^{-3}	VH	H	M	M	VL
D - UNLIKELY	10^{-4}	H	M	L	L	VL
E - RARE	10^{-5}	M	L	L	VL	VL
F - BARELY CREDIBLE	10^{-6}	L	VL	VL	VL	VL

Notes: (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.
(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

RISK LEVEL IMPLICATIONS

Risk Level		Example Implications (7)
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.

Appendix VI: Geotechnical Declaration

FORM **A**

Geotechnical Declaration and Verification Development Application

Office Use Only		Regulator: COLAC-OTWAY SHIRE

To be submitted with a development application. If this form is not submitted with the geotechnical report the report will be refused.
This form is essential to verify that the geotechnical report has been prepared in accordance with Schedule 1 to the Erosion Management Overlay and that the author of the geotechnical report is a geotechnical engineer or engineering geologist as defined by Schedule 1 to the Erosion Management Overlay. Alternatively, where a geotechnical report has been prepared for subdivision or is greater than two years old or by a professional person not recognized by Schedule 1 to the Erosion Management Overlay, then this form may be used as technical verification of the geotechnical report if signed by a geotechnical engineer or engineering geologist as defined by Schedule 1 to the Erosion Management Overlay.

Section 1 Related Application

Reference	
DA Site Address	1695 Carlisle Road GELLIBRAND VIC
DA Applicant	G & L Toussaint

Section 2 Geotechnical Report

Details	Title: Geotechnical Assessment for Site Excavation and Solar Array at 1695 Carlisle Road GELLIBRAND	
	Author's Company/Organization Name: AGR Geosciences Pty Ltd	Report Reference No: 19I429GTA
	Author: David J Horwood	Dated: 16 / 10 / 2019

Section 3 Checklist

The following checklist covers the minimum requirements to be addressed in a geotechnical report. This checklist is to accompany the report. Each item is to be cross-referenced to the section or page of the geotechnical report which addresses that item.

Geotechnical Requirements (Tick as appropriate, either Yes or No) Yes	No	
☒	☐	A review of readily available history of slope instability in the site or related land as per *section 4.1; 4.1.2; 4.1.3*
☒	☐	An assessment of the risk posed by all reasonably identifiable geotechnical hazards as per *Sections 4.4, 4.4.1, 5.0*
☒	☐	Plans and sections of the site and related land as per *Figures 1-10, Section 4.0*
☒	☐	Presentation of a geological model as per *Figures 1-9 Section 4.1.1; Section 4.2 & Section 4.3*
☒	☐	Photographs and/or drawings of the site as per *Appendices ii-iii*
☒	☐	A conclusion as to whether the site is suitable for the development proposed to be carried out either conditionally or unconditionally as per *Section 5.0*
☐	☐	If any items above are ticked No, an explanation is to be included in the report to justify why. <*Add reference*>

Yes	No	Subject to recommendations and conditions relevant to:
☒	☐	selection and construction of footing systems,
☒	☐	earthworks,
☒	☐	surface and sub-surface drainage,
☒	☐	recommendations for the selection of structural systems consistent with the geotechnical assessment of the risk,
☒	☐	any conditions that may be required for the ongoing mitigation and maintenance of the site and the proposal, from a geotechnical viewpoint,
☐	☒	highlighting and detailing the inspection regime to provide the Colac-Otway Shire and builder with adequate notification for all necessary inspections.
☒	☐	State Design life adopted: 50 Years

FORM **A**

Geotechnical Declaration and Verification Development Application

Section 4 List of Drawings referenced in Geotechnical Report

Design Documents

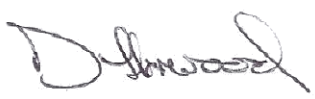
Description	Plan or Document No.	Revision or Version No.	Date	Author
Plan of Proposed Subdivision	18-40	2		Rod Bright & Associates

Section 5 Declaration

Declaration (Tick all that apply)

Yes	No		
☒	☐	**I am a geotechnical engineer or engineering geologist as defined by the** Schedule 1 to the Erosion Management Overlay **and on behalf of the company below, I:**	
☒	☐	am aware that the geotechnical report I have either prepared or am technically verifying (referenced above) is to be submitted in a support of a development application for the proposed development site (referenced above) and its findings will be relied upon by Colac-Otway Shire in determining the development application.	
☒	☐	prepared the geotechnical report referenced above in accordance with the AGS (2007c) as amended and Schedule 1 to the Erosion Management Overlay.	N/A
☒	☐	am willing to technically verify that the Geotechnical Report referenced above has been prepared in accordance with the AGS (2007c) as amended and Schedule 1 to the Erosion Management Overlay.	N/A
☒	☐	am willing to technically verify that the geotechnical assessment prepared for the development application for the site confirms the land will achieve the level of *acceptable* of slope instability as a result of the considerations described in Section 2.0 of Schedule 1 to the Erosion Management Overlay taking into account the total development and site disturbances proposed.	No
☐	☒	am willing to technically verify that the landslip risk assessment prepared for the site and related land being greater than two years old confirms the land will achieve the level of t*olerable risk* of slope instability as a result of the considerations described Section 2.0 of Schedule 1 to the Erosion Management Overlay *taking into account the total development and site disturbances proposed.*	N/A
☒	☐	have professional indemnity insurance in accordance with and Schedule 1 to the Erosion Management Overlay of not less than $1.0 million, being in force for the year in which the report is dated, with retroactive cover under this insurance policy extending back to the engineer's first submission to Colac-Otway Shire.	No

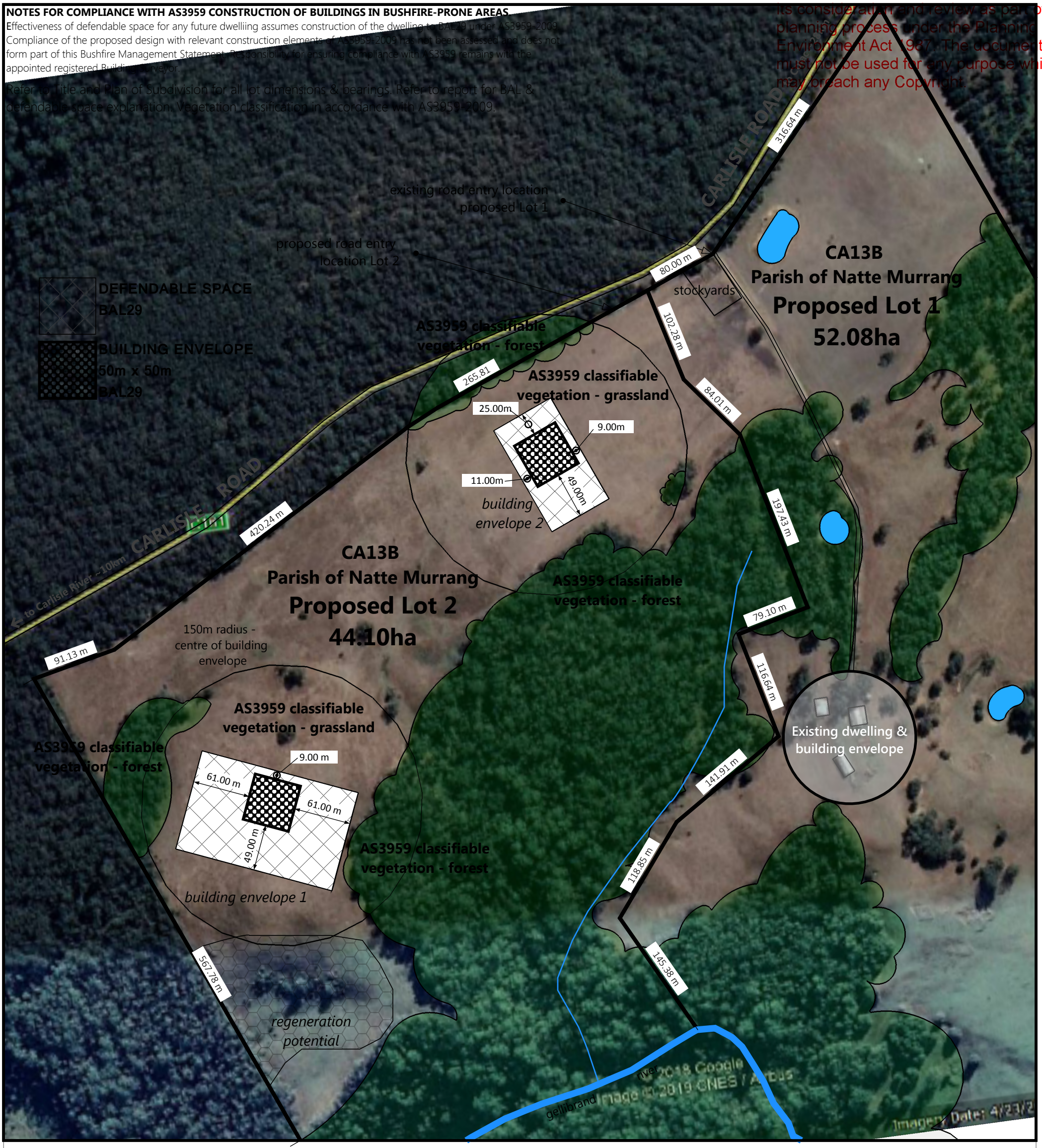
Section 6 Geotechnical Engineer or Engineering Geologist Details

Company/ Organization Name	AGR Geosciences Pty Ltd	
Name (Company Representative)	Surname: Horwood	Mr /Mrs /Other: Mr
	Given Names: David John	
	Chartered Professional Status: **CP (Geo)**	Registration No: **321719**
Signature		Dated: 16 / 10 / 2019

NOTES FOR COMPLIANCE WITH AS3959 CONSTRUCTION OF BUILDINGS IN BUSHFIRE-PRONE AREAS

Effectiveness of defendable space for any future dwelliing assumes construction of the dwelling to BAL29 under AS3959- 2009. Compliance of the proposed design with relevant construction elements of AS3959- 2009 has not been assessed and does not form part of this Bushfire Management Statement. Responsibility for ensuring compliance with AS3959 remains with the appointed registered Building Surveyor.

Refer to Title and Plan of Subdivision for all lot dimensions & bearings. Refer to report for BAL & defendable space explanation. Vegetation classification in accordance with AS3959-2009.



WATER SUPPLY

A 10,000 litre water supply tank will be provided for fire fighting purposes to any future dwelling and must comply with the following requirements:

1. Be stored in an above ground water tank constructed of concrete or metal.
2. Have all fixed above ground water pipes and fittings required for firefighting purposes made of corrosive resistant metal.
3. Include a separate outlet for occupant use.

Fire authority fittings and access must be provided as follows:

1. Be readily identifiable from the building or appropriate identification signs provided to the satisfaction of the relevant fire authority.
2. Be located within 60 metres of the outer edge of the approved building.
3. The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed.
4. Incorporate a separate ball or gate valve (British Standard Pipe (BSP 65 mm) and coupling (64 mm CFA 3 thread per inch male fitting).
5. Any pipework and fittings must be a minimum of 65 mm (excluding the CFA coupling).

DEFENDABLE SPACE

VEGETATION MANAGEMENT REQUIREMENT.

Defendable space is provided and is managed in accordance with the following requirements:

1. Grass must be short cropped and maintained during the delared fire danger period.
2. All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
3. Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
4. Plants greater than 10 cm in height must not be placed within 3 metres of a window or glass feature of the building.
5. Shrubs must not be located under the canopy of trees.
6. Individual and clumps of shrubs must not exceed 5 square metres in area and must be separated by at least 5 metres.
7. Trees must not overhang or touch any elements of the building.
8. The canopy of trees must be separated by at least 5 metres.
9. There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Unless specified in a schedule or otherwise agreed in writing to the satisfaction of the relevant fire authority.

EMERGENCY VEHICLE ACCESS DESIGN AND CONSTRUCTION.

Access for emergency vehicles will be provided to the any future dwelling and static water supply outlet and must comply with the following design requirements (including gates, bridges and culverts):

1. Fire authority vehicles should be able to get within 4 metres of the water supply outlet.

The following design and construction requirements apply:

1. All-weather construction.
2. A load limit of at least 15 tonnes.
3. Provide a minimum trafficable width of 3.5 metres.
4. Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically.
5. Curves must have a minimum inner radius of 10 metres.
6. The average grade must be no more than 1 in 7 (14.4%) (8.1 degrees) with a maximum of no more than 1 in 5 (20%) (11.3 degrees) for no more than 50 metres.
7. Dips must have no more than a 1 in 8 (12.5%) (7.1 degrees) entry and exit angle.

A turning area for fire fighting vehicles must be provided close to the building by one of the following:

1. A turning circle with a minimum radius of eight metres.
2. A driveway encircling the dwelling.
3. The provision of other vehicle turning heads - such as a T or Y head - which meet the specification of Austroad Design for an 8.8 metre Service Vehicle.

Where the length of access is greater than 200 metres,

1. Passing bays must be provided every 200 metres.
2. Passing bays must be a minimum of 20 metres long with a minimum trafficable width of 6 metres.

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

VOLUME 09428 FOLIO 691

Security no : 124080311314W
Produced 19/11/2019 01:37 PM

LAND DESCRIPTION

Crown Allotment 13B Parish of Natte Murrang.
PARENT TITLE Volume 04378 Folio 550
Created by instrument H778418 27/11/1979

REGISTERED PROPRIETOR

Estate Fee Simple
Joint Proprietors
GAETAN JEAN-PIERRE TOUSSAINT
LAUREN MARJORY TOUSSAINT both of 1695 CARLISLE ROAD CARLISLE RIVER VIC 3239
AR477293Y 21/09/2018

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AR477294W 21/09/2018
NATIONAL AUSTRALIA BANK LTD

For details of any other encumbrances see the plan or imaged folio set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE TP283119D FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NIL

----------END OF REGISTER SEARCH STATEMENT----------

Additional information: (not part of the Register Search Statement)

Street Address: 1695 CARLISLE ROAD CARLISLE RIVER VIC 3239

See MI312498P for WATER FRONTAGE LICENCE details

ADMINISTRATIVE NOTICES

NIL

eCT Control 00009E NATIONAL AUSTRALIA BANK
Effective from 21/09/2018

DOCUMENT END

TITLE PLAN

EDITION 1 TP 283119D

Location of Land

Parish: NATTE MURRANG
Township:
Section:
Crown Allotment: 13B
Crown Portion:

Last Plan Reference:
Derived From: VOL 9428 FOL 691
Depth Limitation: 15.24 m

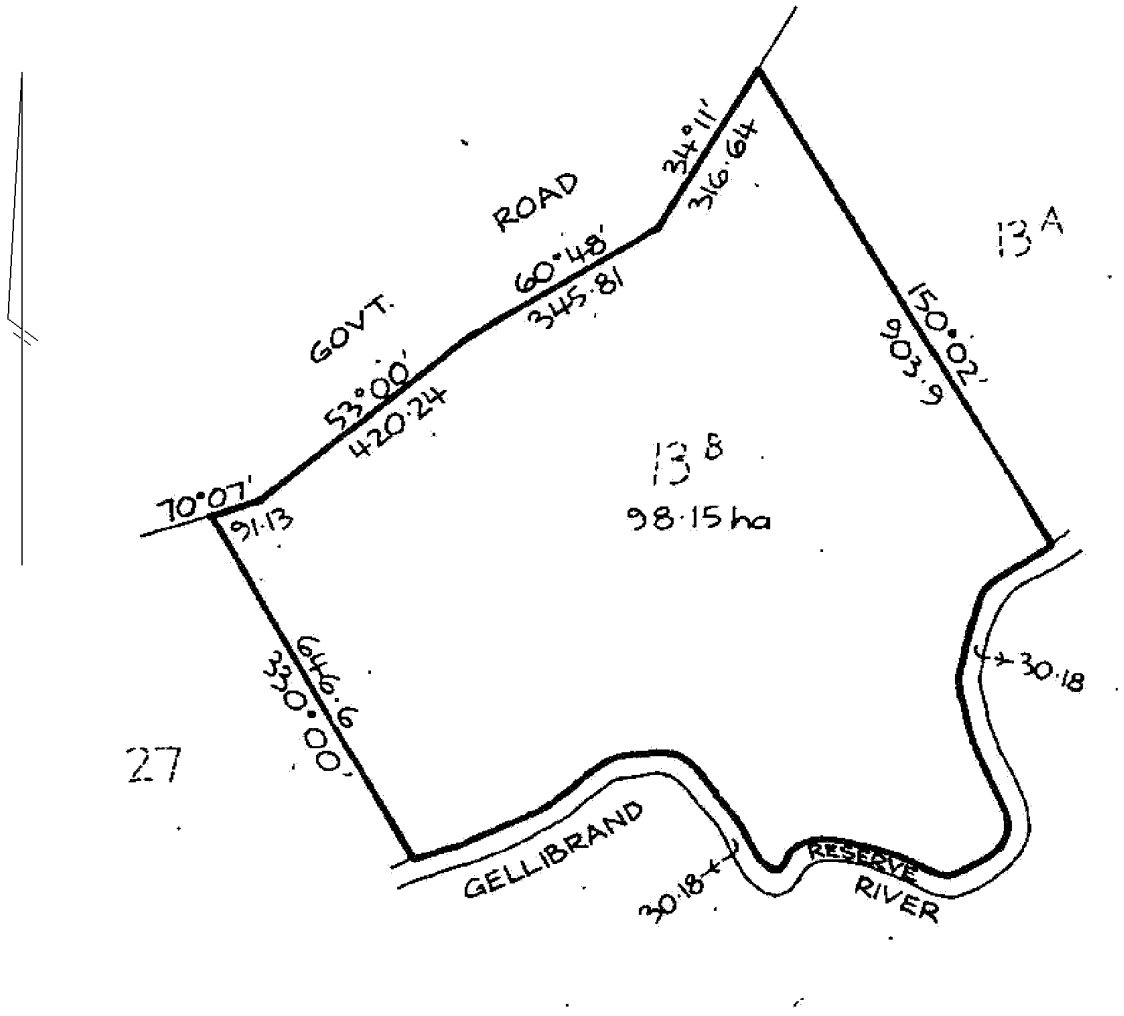
Notations

WATERWAY NOTATION: LAND IN THIS PLAN MAY ABUT CROWN LAND THAT MAY BE SUBJECT TO A CROWN LICENCE TO USE

ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN

Description of Land / Easement Information

THIS PLAN HAS BEEN PREPARED FOR THE LAND REGISTRY, LAND VICTORIA, FOR TITLE DIAGRAM PURPOSES AS PART OF THE LAND TITLES AUTOMATION PROJECT
COMPILED: 21/01/2000
VERIFIED: C.L.



LENGTHS ARE IN METRES | Metres = 0.3048 x Feet | Metres = 0.201168 x Links | Sheet 1 of 1 sheets

PLAN OF PROPOSED SUBDIVISION
CROWN ALLOTMENT 13B
PARISH OF NATTE MURRANG
COUNTY OF POLWARTH
RE: G. & L. TOUSSAINT
SCALE 1:7500 (Original Sheet Size A3)

ROD BRIGHT & ASSOCIATES PTY LTD
LICENSED SURVEYORS & TOWN PLANNERS
26 MURRAY STREET COLAC 3250
TEL 5231 4883 ACN 007 206 975

NOTE:
Certain dimensions shown hereon are subject to survey.
Certain areas shown hereon are subject to survey.
Land contained within C/T Vol. Fol.

Existing Conditions Diagram

REF. 18-40

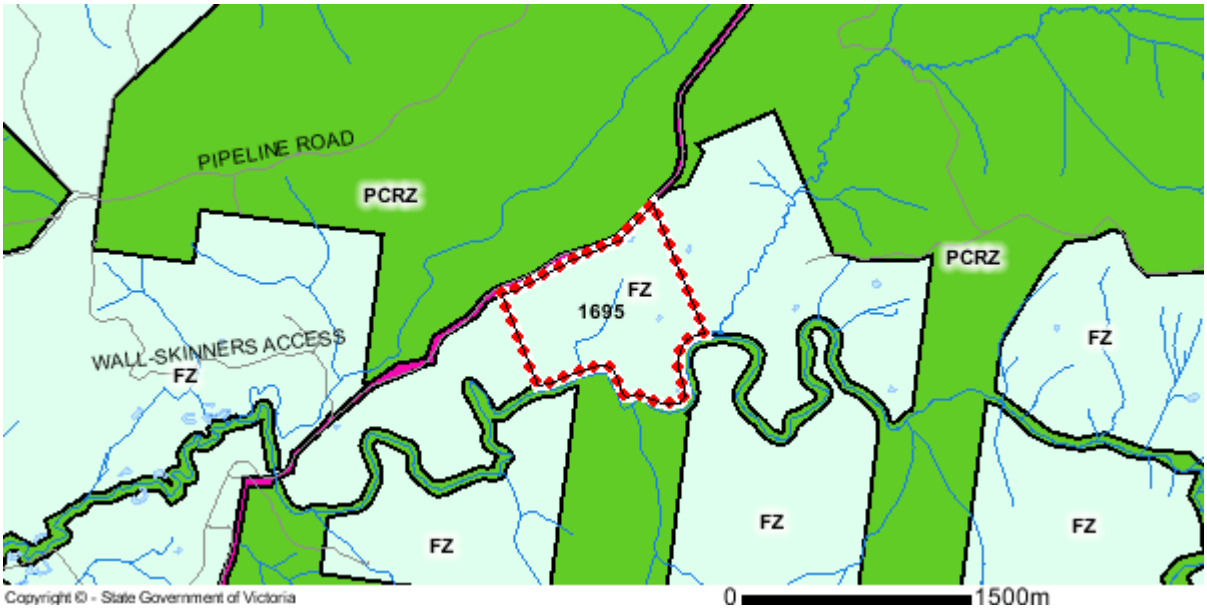
Planning Property Report

from www.planning.vic.gov.au on 22 November 2019 02:40 PM

Crown Description: Allot. 13B NATTE MURRANG
Address: 1695 CARLISLE ROAD CARLISLE RIVER 3239
Local Government (Council): COLAC OTWAY **Council Property Number:** 21778
Directory Reference: VicRoads 100 J2

Planning Zone

FARMING ZONE (FZ)
SCHEDULE TO THE FARMING ZONE (FZ)



Note: labels for zones may appear outside the actual zone - please compare the labels with the legend.

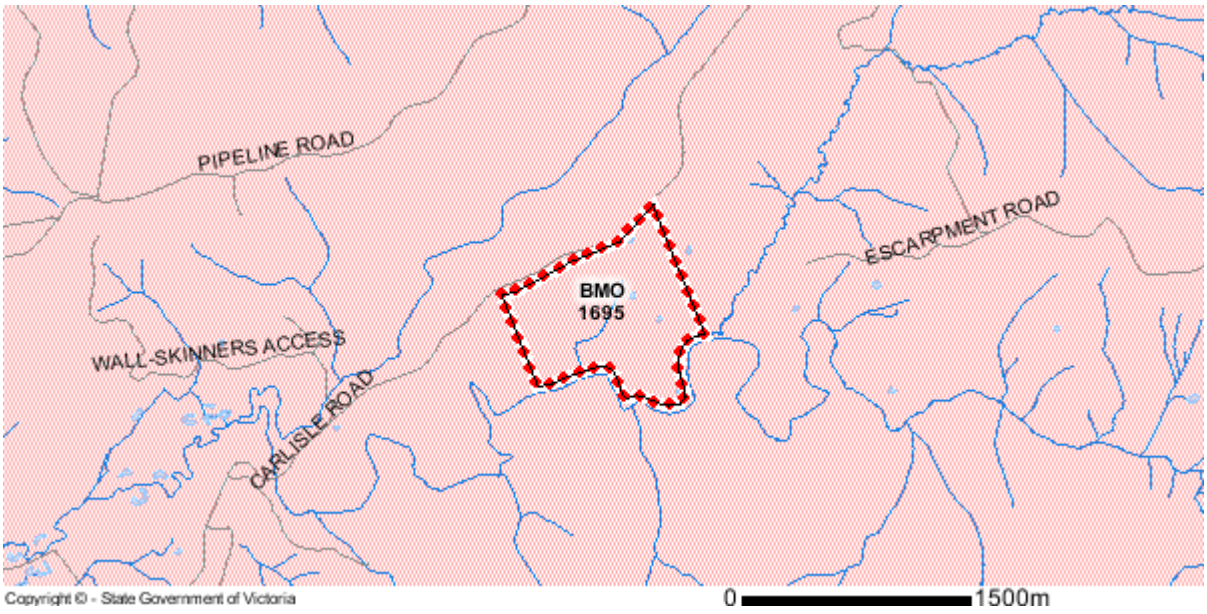
Zones Legend

- ACZ - Activity Centre
- B1Z - Commercial 1
- B2Z - Commercial 1
- B3Z - Commercial 2
- B4Z - Commercial 2
- B5Z - Commercial 1
- C1Z - Commercial 1
- C2Z - Commercial 2
- CA - Commonwealth Land
- CCZ - Capital City
- CDZ - Comprehensive Development
- DZ - Dockland
- ERZ - Environmental Rural
- FZ - Farming
- GRZ - General Residential
- GWAZ - Green Wedge A
- GWZ - Green Wedge
- IN1Z - Industrial 1
- IN2Z - Industrial 2
- IN3Z - Industrial 3
- LDRZ - Low Density Residential
- MUZ - Mixed Use
- NRZ - Neighbourhood Residential
- PCRZ - Public Conservation & Resource
- PDZ - Priority Development
- PPRZ - Public Park & Recreation
- PUZ1 - Public Use - Service & Utility
- PUZ2 - Public Use - Education
- PUZ3 - Public Use - Health Community
- PUZ4 - Public Use - Transport
- PUZ5 - Public Use - Cemetery/Crematorium
- PUZ6 - Public Use - Local Government
- PUZ7 - Public Use - Other Public Use
- PZ - Port
- R1Z - General Residential
- R2Z - General Residential
- R3Z - General Residential
- RAZ - Rural Activity
- RCZ - Rural Conservation
- RDZ1 - Road - Category 1
- RDZ2 - Road - Category 2
- RGZ - Residential Growth
- RLZ - Rural Living
- RUZ - Rural
- SUZ - Special Use
- TZ - Township
- UFZ - Urban Floodway
- UGZ - Urban Growth
- Urban Growth Boundary

Railway Tram River, stream Lake, waterbody

Planning Overlays

BUSHFIRE MANAGEMENT OVERLAY (BMO)



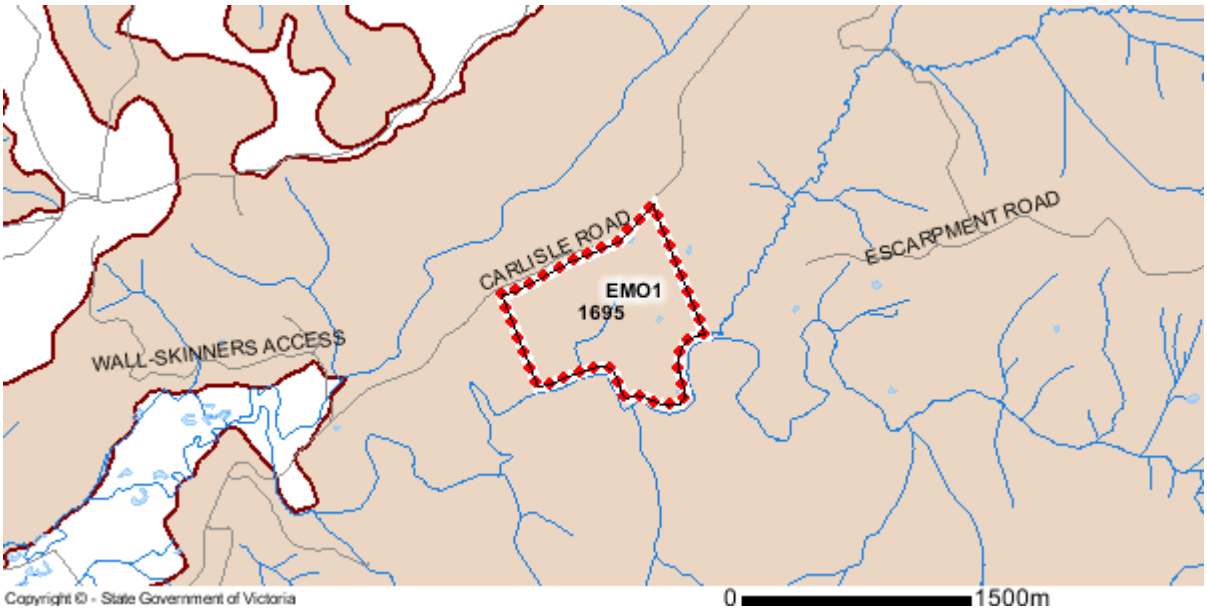
ENVIRONMENTAL SIGNIFICANCE OVERLAY (ESO)

ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 3 (ESO3)

Planning Overlays

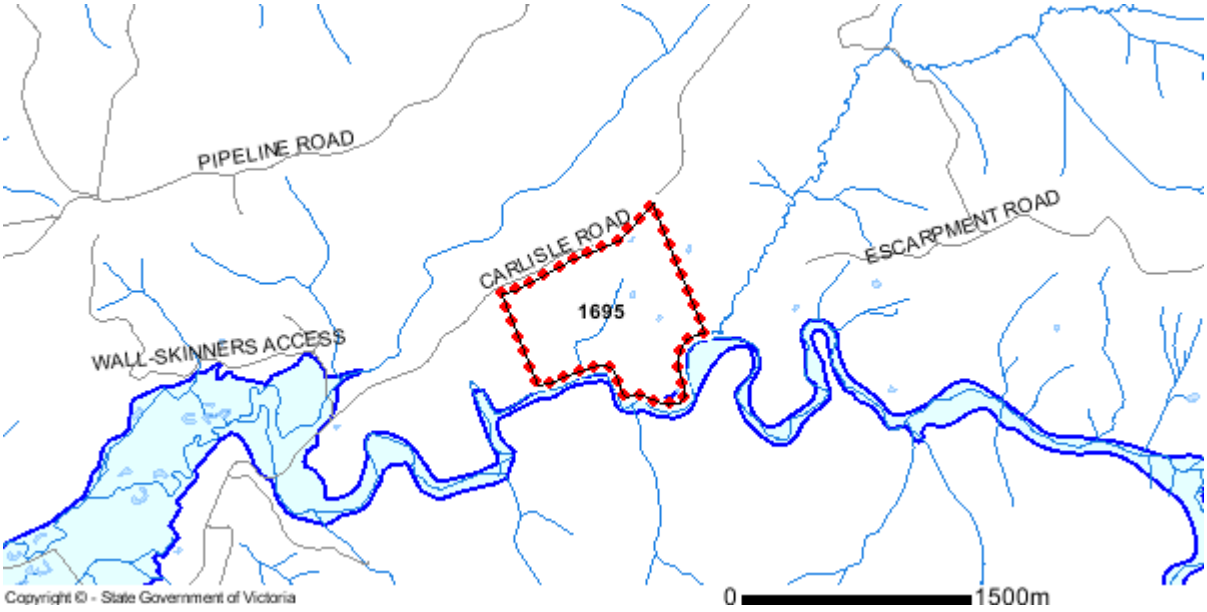
EROSION MANAGEMENT OVERLAY (EMO)

EROSION MANAGEMENT OVERLAY - SCHEDULE 1 (EMO1)



LAND SUBJECT TO INUNDATION OVERLAY (LSIO)

LAND SUBJECT TO INUNDATION OVERLAY SCHEDULE (LSIO)

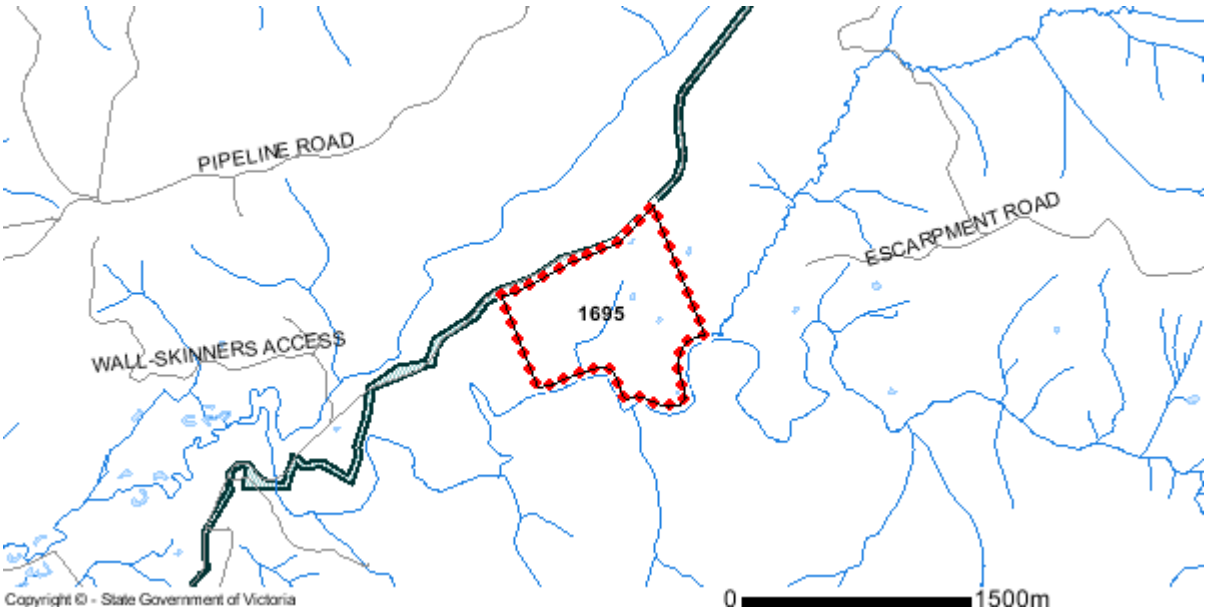


Planning Overlays

OTHER OVERLAYS

Other overlays in the vicinity not directly affecting this land

VEGETATION PROTECTION OVERLAY (VPO)



Overlays Legend

- AEO - Airport Environs
- BMO - Bushfire Management
- CLPO - City Link Project
- DCPO - Development Contributions Plan
- DDO - Design & Development
- DDOPT - Design & Development Part
- DPO - Development Plan
- EAO - Environmental Audit
- EMO - Erosion Management
- ESO - Environmental Significance
- FO - Floodway
- HO - Heritage
- ICPO - Infrastructure Contributions Plan
- IPO - Incorporated Plan
- LSIO - Land Subject to Inundation
- MAEO1 - Melbourne Airport Environs 1
- MAEO2 - Melbourne Airport Environs 2
- NCO - Neighbourhood Character
- PO - Parking
- PAO - Public Acquisition
- RO - Restructure
- RCO - Road Closure
- SBO - Special Building
- SLO - Significant Landscape
- SMO - Salinity Management
- SRO - State Resource
- VPO - Vegetation Protection

Railway | Tram | River, stream | Lake, waterbody

Note: due to overlaps some colours on the maps may not match those in the legend.

Areas of Aboriginal Cultural Heritage Sensitivity

All or part of this parcel is an 'area of cultural heritage sensitivity'.

'Areas of cultural heritage sensitivity' are defined under the Aboriginal Heritage Regulations 2018, and include registered Aboriginal cultural heritage places and land form types that are generally regarded as more likely to contain Aboriginal cultural heritage.

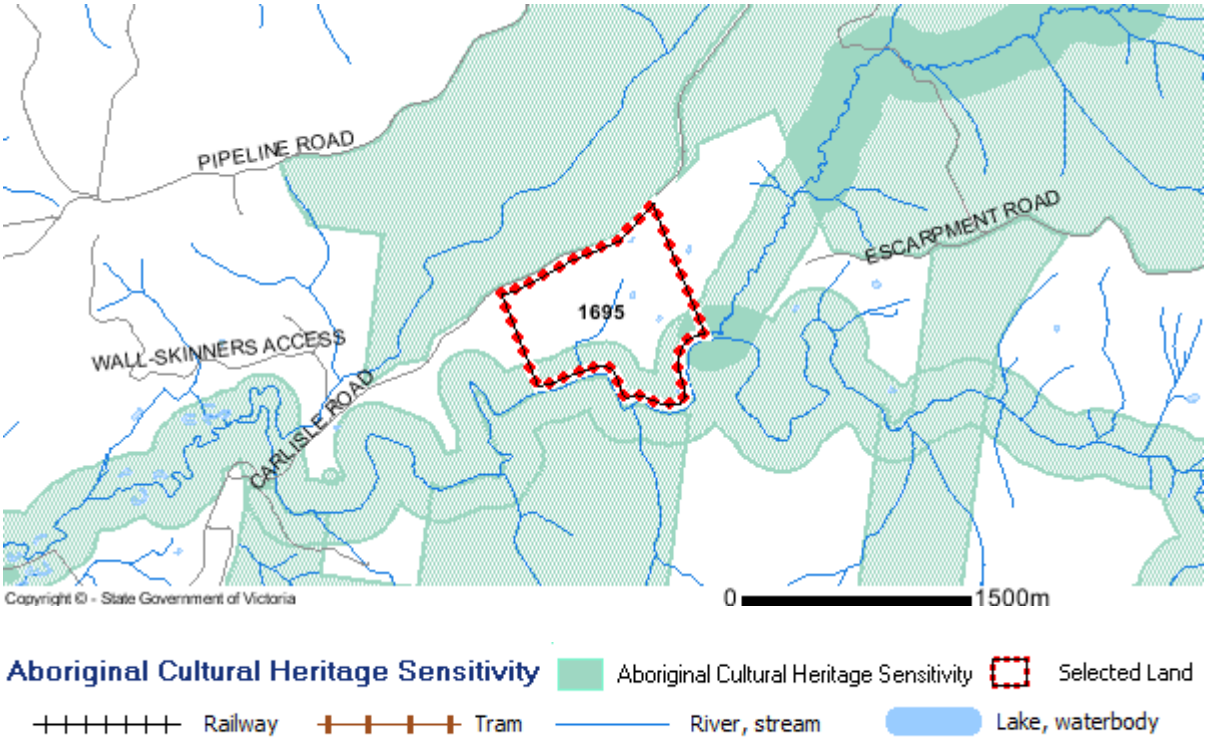
Under the Aboriginal Heritage Regulations 2018, 'areas of cultural heritage sensitivity' are one part of a two part trigger which require a 'cultural heritage management plan' be prepared where a listed 'high impact activity' is proposed.

If a significant land use change is proposed (for example, a subdivision into 3 or more lots), a cultural heritage management plan may be triggered. One or two dwellings, works ancillary to a dwelling, services to a dwelling, alteration of buildings and minor works are examples of works exempt from this requirement.

Under the Aboriginal Heritage Act 2006, where a cultural heritage management plan is required, planning permits, licences and work authorities cannot be issued unless the cultural heritage management plan has been approved for the activity.

For further information about whether a Cultural Heritage Management Plan is required go to http://www.aav.nrms.net.au/aavQuestion1.aspx

More information, including links to both the Aboriginal Heritage Act 2006 and the Aboriginal Heritage Regulations 2018, can also be found here - https://www.vic.gov.au/aboriginalvictoria/heritage/planning-and-heritage-management-processes.html



Further Planning Information

Planning scheme data last updated on 21 November 2019.

A **planning scheme** sets out policies and requirements for the use, development and protection of land.
This report provides information about the zone and overlay provisions that apply to the selected land.
Information about the State and local policy, particular, general and operational provisions of the local planning scheme that may affect the use of this land can be obtained by contacting the local council or by visiting Planning Schemes Online

This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the *Planning and Environment Act 1987.*
It does not include information about exhibited planning scheme amendments, or zonings that may abut the land.
To obtain a Planning Certificate go to Titles and Property Certificates

For details of surrounding properties, use this service to get the Reports for properties of interest

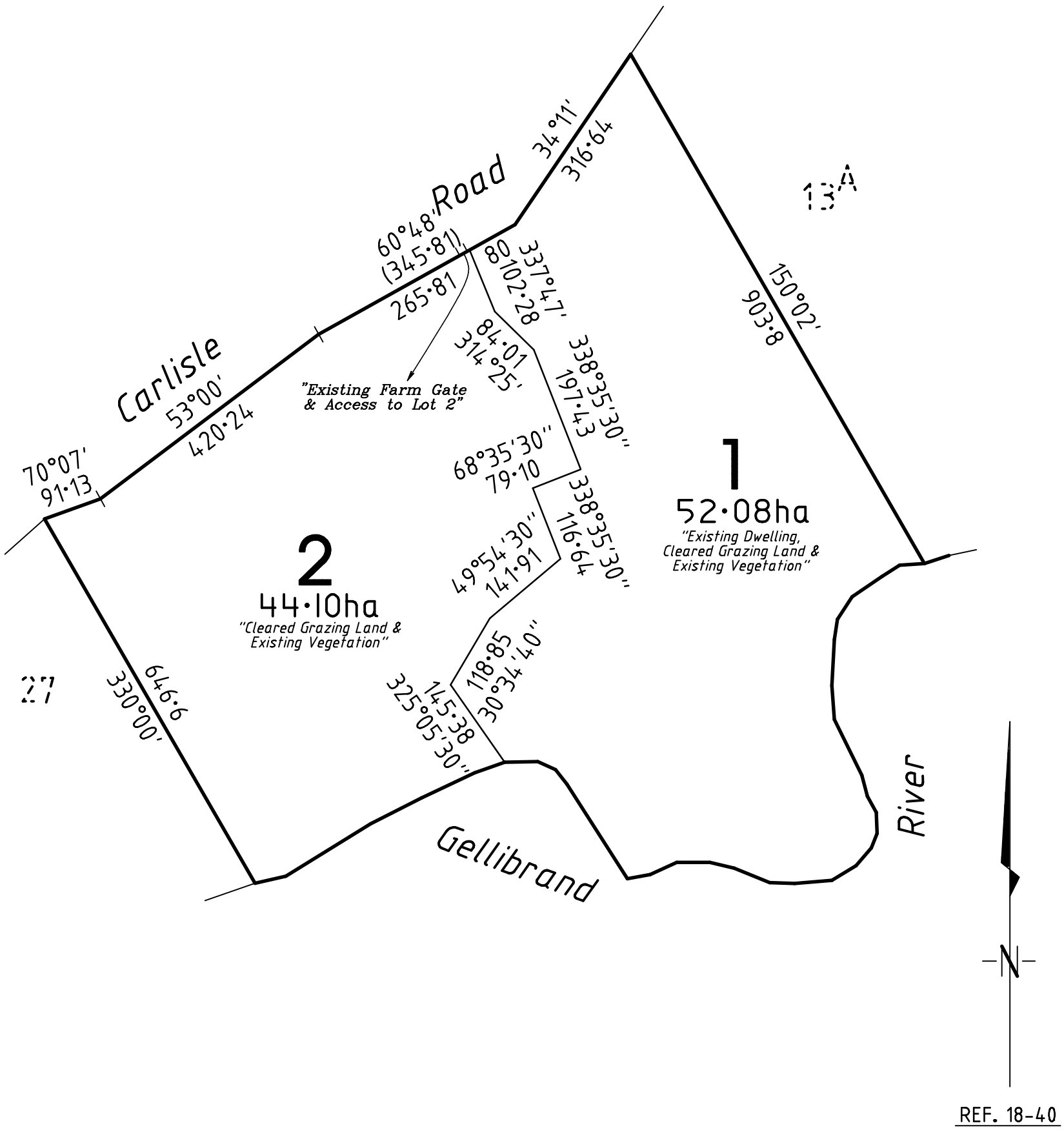
To view planning zones, overlay and heritage information in an interactive format visit Planning Maps Online

For other information about planning in Victoria visit www.planning.vic.gov.au

PLAN OF PROPOSED SUBDIVISION
CROWN ALLOTMENT 13B
PARISH OF NATTE MURRANG
COUNTY OF POLWARTH
RE: G. & L. TOUSSAINT
SCALE 1:7500 (Original Sheet Size A3)

ROD BRIGHT & ASSOCIATES PTY LTD
LICENSED SURVEYORS & TOWN PLANNERS
26 MURRAY STREET COLAC 3250
TEL 5231 4883 ACN 007 206 975

NOTE:
Certain dimensions shown hereon are subject to survey.
Certain areas shown hereon are subject to survey.
Land contained within C/T Vol. Fol.



Dated: 16th December 2019.

PLAN OF PROPOSED SUBDIVISION
CROWN ALLOTMENT 13B
PARISH OF NATTE MURRANG
COUNTY OF POLWARTH
RE: G. & L. TOUSSAINT
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NOTE:
Certain dimensions shown hereon are subject to survey.
Certain areas shown hereon are subject to survey.
Land contained within C/T Vol. Fol.

Existing Conditions Diagram

REF. 18-40

Dated: 16th December 2019.

ROD BRIGHT & ASSOCIATES PTY. LTD.
LAND SURVEYORS & TOWN PLANNERS
A.C.N. 007 206 975 A.B.N. 50 007 206 975

20 Murray Street,
Colac 3250
P.O. Box 771

Tel. (03) 5231 4883
Fax. (03) 5231 4883

17 February 2020

REF: 18-40

Colac Otway Shire
Planning Department
P.O. Box 283
COLAC VIC 3250

Attention: Mr Ian Williams, Senior Statutory Planner

Dear Ian,

RE: FURTHER INFORMATION REQUEST, PP269/2019-1
1695 CARLISLE ROAD, CARLISLE RIVER
MR & MRS GUY & LAUREN TOUSSAINT

We refer to Council's request for further information of 20 December 2019.

1. Our clients advise the farm gate was placed as part of fencing works carried out within the last couple of years. Approval is sought under the current permit application to create a new access to the Carlisle Road.

2. Responding to points 2, 3 & 4 of your letter, we advise the following:

- The proposed subdivision formalises the Toussiants' ongoing farm and environmental land management actions, which they have documented within a land management plan (attached) for reference. The plan reflects how the subdivision responds to land management outcomes at the site. In particular:

    - The subdivision will enable the owners to continue their pursuit of micro-farming (garlic) and soil improvement through green cropping and grazing at sustainable levels to enable the soil to recover and avoid reliance on importation of stock feed.

    - The environmental land management responsibilities are intense due to the terrain and the isolated location, (eg. blackberry control along the Gellibrand River) and more relative time and money is spent managing these aspects than would be expected in other areas, particularly those areas identified as 'farmland of strategic significance' where larger farms and extensive grazing and cropping dominate farm production and amenable terrain allows easier access for weed/pest control.

- There is no short nor medium-term opportunity to increase farm sizes in this area due to the adjacent long-term forestry land uses and surrounding crown land.

- The land management plan reflects the Toussaints' positive contributions around sustainable land management by way of the following:
  - Protection of all native vegetation by comprehensive internal stock exclusion fencing;
  - internal fencing to reflect land classes/soil testing for paddock management separation;
  - ongoing commitment to pest plant/animal management and reduction;
  - revegetation to improve erosion areas and farm productivity;
  - commitment to protect the health of the waterway within their land title, and the health of the adjoining Gellibrand River.

- The subdivision boundary is generally located to reflect land management outcomes – change in soil type, following existing infrastructure and fencing, and allowing for access to the road.

- The land management plan can be the basis of a Section 173 Agreement which can obligate any future landholders to continue to implement the plan.

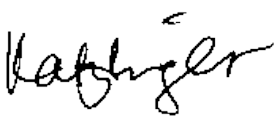
- The reduction in land area will enable these land management requirements to be shared with another landholder which will result in more sustained and effective outcomes over time and benefit the local community.

- Purposes of the Farming Zone, such as: t*o provide for the use of land for agriculture; and to encourage use and development of land based on comprehensive and sustainable land management practices,* are clearly responded to in this permit application supported by the LMP.

3. The Bushfire Management Plan has been amended to change the dwelling notation.

We trust the information provided clarifies the proposal. Please do not hesitate to contact us if you require further information.

Yours faithfully,



.....
Katy Bright
ROD BRIGHT & ASSOCIATES
encl.
copy via email: L & G Toussaint.

LAND MANAGEMENT PLAN
1695 CARLISLE ROAD, CARLISLE RIVER

LAUREN & GUY TOUSSAINT

FEBRUARY 2020

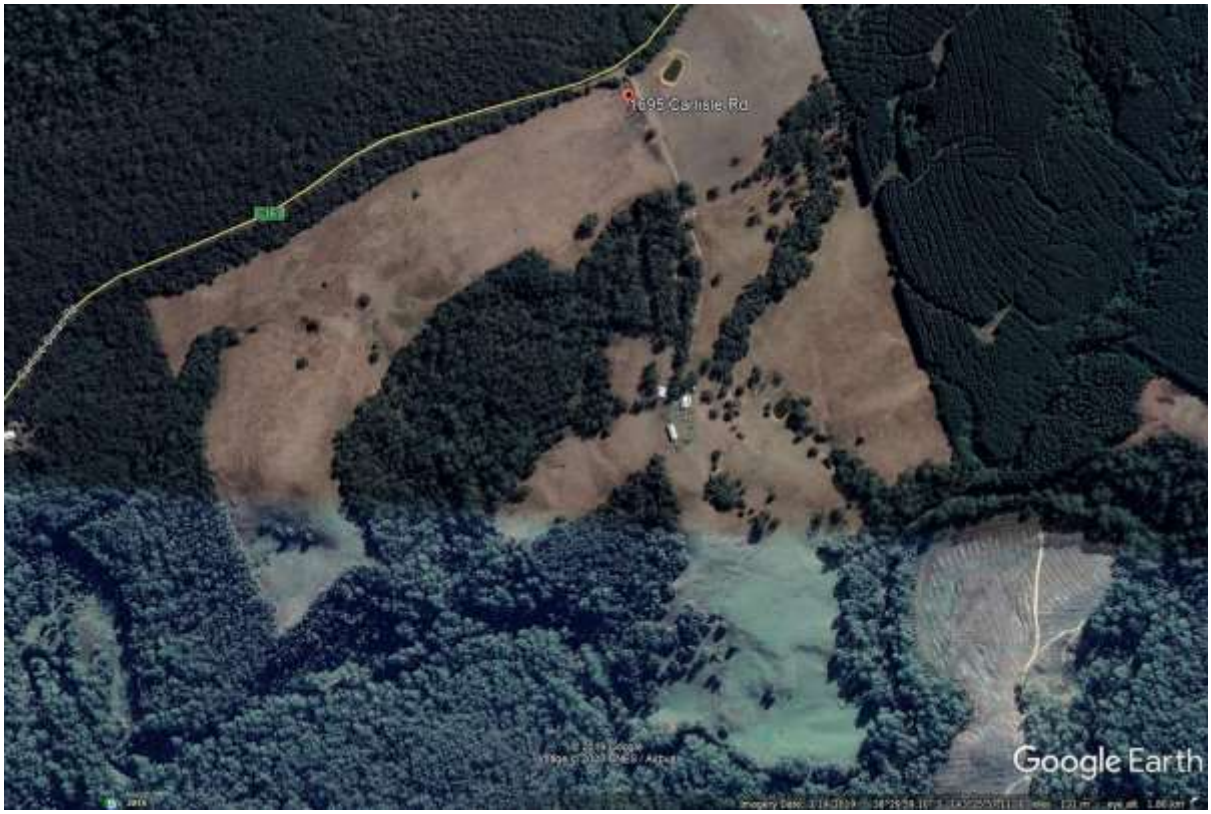


Table of Contents

Acknowledgement:

Macedon Ranges Shire Council Property Management Plan Template was used as a basis for this plan.

1.0 LAND IDENTIFICATION

Landholder name:
Lauren & Guy Toussaint

Property address:
1695 Carlisle Road, Carlisle River

Postal address:
1695 Carlisle Road, Carlisle River 3239

Phone:
0459614340

Email:
lauren.toussaint <lauren.toussaint@bigpond.com>

Property title reference:
Crown Allotment 13B Parish of Natte Murrang

Vol/Fol 09428/691

Total Property Area:
98.15 hectares

2.0 LAND USE & GOALS

2.1 PRIMARY USE OF PROPERY

a. Farming: Beef cattle, Sheep
b. Cropping: Garlic, Green manure
c. Conservation
d. Living/caretaking

2.2 CURRENT LAND MANAGEMENT ISSUES AT THE PROPERTY

a. Erosion and Landslip
b. Soil Structure and Fertility
c. Water Flow
d. Weeds
e. Pests

2.3 SURROUNDING LAND DESCRIPTION

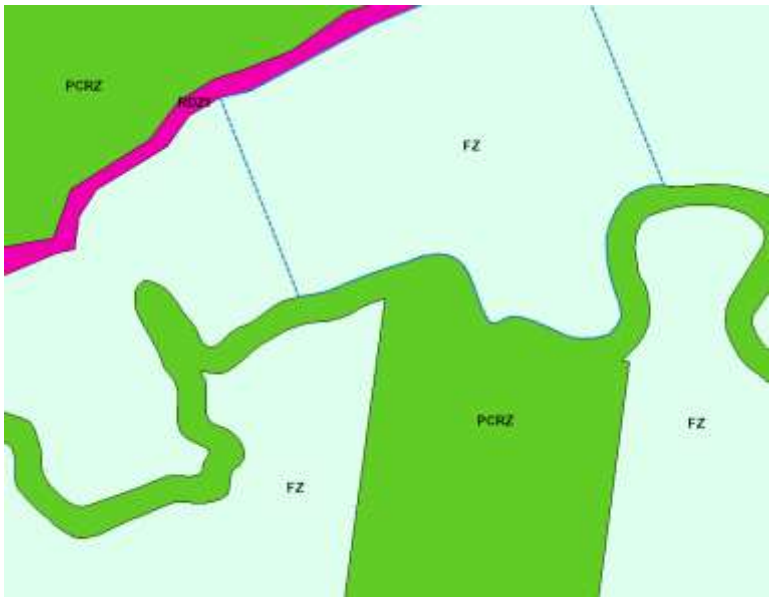
- Pine and Blue-Gum Plantations
- Gellibrand River
- Natural Bush
- Wildlife Shelter

2.4 LAND MANAGEMENT GOALS

- To fence off and re-vegetate erosion and landslip areas
- To protect natural bush
- To protect waterways
- To remove weeds
- To reduce pest animals
- To fence out wildlife

3.0 PLANNING ZONES & OVERLAYS

3.1 ZONES



- The land is zoned Farming.
- Carlisle Road is in a Road Zone – Category 1
- Land to the north and south is zoned Pubic Conservation and Resource Zone

3.2 OVERLAYS

- Environment Significance Overlay 3 – Proclaimed water catchment areas
- Erosion Management Overlay 1 – Areas susceptible to erosion and landslip
- Bushfire Management Overlay
- Environment Significance Overlay 2 – Lakes, wetlands and watercourses - applies to the Gellibrand River

4.0 LAND USE CAPABILITIES AND SOIL MANAGEMENT

4.1 LAND CLASS CLASSIFICATION

LAND CLASS	DESCRIPTION OF PROPERTY AREA/LOCATION	PROPOSED LAND USE
Sandy Loam	Bond Hill, Bond, Race, Ascot, Vista paddocks	Sheep, Cattle, Garlic, Crops
Clay	Range, Pine, Diary, River, Chook paddocks	Sheep, Cattle, Garlic, Crops

4.2 SOIL - PROPERTY DISTRIBUTION/LAND USE IMPLICATIONS

REFER TO 4.3 SOIL ANALYSIS

- Soil varies across arable areas.
- Effort needs to include increasing depth of top soil.
- Erosion and landslip areas can be managed by fencing and revegetation.
- Areas above erosion/landslips need drainage

4.3 SOILS

Refer to soil test analysis following.

SWEP PTY. LTD. ANALYTICAL LABORATORIES
Tel: (03) 9701 6007
Fax: (03) 9701 5512

ASPAC
A member of the Australasian Soil and Plant Analysis Council

REPORT ON SAMPLE OF SOIL

FILE NO : 1510114454 **DATE ISSUED :** 12/10/2015

LAUREN TOUSSAINT
1695 CARLISLE ROAD
CARLISLE RIVER, VIC 3239

E-mail: lauren.toussaint@bigpond.com

CLIENT ID : TOU004
PHONE : 0459 614 340
FAX :

SAMPLE ID : BOND BLOCK (8HA)
DEPTH OF SAMPLE (cm): 0 to 10

REFERENCE :
REFERENCE PHONE :
DATE RECEIVED : 7/10/2015
ANALYSIS REQUIRED : Full (ST-1)

ITEMS			RESULTS	DESIRABLE LEVEL PASTURE	DESIRABLE LEVEL GARLIC
pH(1:5 Water)*			5.6	5.5-7.5	6.0-7.5
pH(1:5 0.01M $CaCl_2$)*			5.1		
Electrical Conductivity*	EC	µS/cm	31	< 300	< 470
TOTAL SOLUBLE SALT	TSS	ppm	102.3	< 990	< 1551
AVAILABLE CALCIUM*	Ca	ppm	1324	1373	1373
AVAILABLE MAGNESIUM*	Mg	ppm	78.48	182	182
AVAILABLE SODIUM*	Na	ppm	31.51	< 116	< 116
AVAILABLE NITROGEN	N	ppm	4.71	21	203
AVAILABLE PHOSPHORUS*	P	ppm	0.1	20	75
AVAILABLE POTASSIUM*	K	ppm	34.398	235	235
AVAILABLE SULPHUR*	S	ppm	2.44	7 - 10	7 - 10
AVAILABLE COPPER*	Cu	ppm	1.5	2	3
AVAILABLE ZINC*	Zn	ppm	2.9	3 - 5	4 - 6
AVAILABLE IRON*	Fe	ppm	19	> 30	> 30
AVAILABLE MANGANESE*	Mn	ppm	3	> 20	> 20
AVAILABLE COBALT	Co	ppm	0.1	0.5-0.7	0.5-0.7
AVAILABLE MOLYBDENUM	Mo	ppm	0.1	0.1-0.2	0.1-0.2
AVAILABLE BORON*	B	ppm	0.24	0.4-0.6	0.6-1.0
TOTAL ORGANIC MATTER*	OM	%	8	3 - 4	3 - 4
TOTAL ORGANIC CARBON*	OC	%	4	1.5 - 2	1.5 - 2
TOTAL PHOSPHORUS*	TP	ppm	not required		
EXTRACTABLE ALUMINIUM*	Al	ppm	not required		
TOTAL NITROGEN*	TN	%	not required		
TOTAL CALCIUM	TCa	ppm	not required		
TOTAL MAGNESIUM	TMg	ppm	not required		
CHLORIDE	Cl	ppm	not required		
AVAILABLE SILICA	Si	ppm	not required		

*This laboratory has been awarded a Certificate of Proficiency for specific soil and plant tissue analyses by the Australasian Soil and Plant Analysis Council (ASPAC). Test for which proficiency has been demonstrated are highlighted in this report.

SWEP Analytical Laboratories
45 - 47 / 174 Bridge Road
Keysborough VIC 3173 Australia

Website: www.swep.com.au
E-mail: services@swep.com.au
Postal Address: P.O. Box 583 Noble Park VIC 3174

FILE NO : 1510114454 **LANDUSE:** PASTURE

ITEMS			RESULTS	DESIRABLE LEVEL
EXCHANGEABLE CALCIUM	Ca	meq/100 of soil	6.46	6.46
EXCHANGEABLE MAGNESIUM	Mg	meq/100 of soil	0.64	1.49
EXCHANGEABLE SODIUM	Na	meq/100 of soil	0.13	< 0.50
EXCHANGEABLE POTASSIUM	K	meq/100 of soil	0.09	0.50
EXCHANGEABLE HYDROGEN	H	meq/100 of soil	6.6	
ADJ. EXCHANG. HYDROGEN	H	meq/100 of soil	2.6	< 1.49
CATION EXCHANGE CAPACITY	CEC	meq/100 of soil	13.92	
ADJUSTED CEC	Adj.CEC	meq/100 of soil	9.92	
EXCH. SODIUM PERCENTAGE	ESP		0.93	< 5
CALCIUM / MAGNESIUM RATIO	Ca/Mg		10.12	2 - 4
BASE SATURATION PERCENTAGE	BSP		53	

ITEMS		PERCENTAGE OF ADJUSTED CEC	DESIRABLE LEVEL
EXCHANGEABLE CALCIUM	Ca	65.1	65-70%
EXCHANGEABLE MAGNESIUM	Mg	6.5	12-15%
EXCHANGEABLE SODIUM	Na	1.3	0.5-5%
EXCHANGEABLE POTASSIUM	K	0.9	3-5%
EXCHANGEABLE HYDROGEN	H	26.2	<20%

PREVIOUS APPLICATIONS (IF APPLICABLE)		DATE OF APPLICATION
GYPSUM APPLIED	t/ha	
LIME APPLIED	t/ha	
DOLOMITE APPLIED	t/ha	
Magnesium Sulphate	kg/ha	

@ Exchangeable Percentage In Relation to Ca, Mg, Na, K

SWEP Analytical Laboratories
45 - 47 / 174 Bridge Road
Keysborough VIC 3173 Australia

Website: www.swep.com.au
E-mail: services@swep.com.au
Postal Address: P.O. Box 583 Noble Park VIC 3174

SWEP PTY. LTD. ANALYTICAL LABORATORIES
Tel: (03) 9701 6007
Fax: (03) 9701 5712

ASPAC
A member of the Australasian Soil and Plant Analysis Council

REPORT ON SAMPLE OF SOIL

FILE NO : 1609121535 **DATE ISSUED :** 20/09/2016

LAUREN TOUSSAINT
1695 CARLISLE ROAD
CARLISLE RIVER, VIC 3239

CLIENT ID : TOU004
PHONE : 0459 614 340
FAX :

E-mail: lauren.toussaint@bigpond.com

SAMPLE ID : PINE PADDOCK
DEPTH OF SAMPLE (cm): 0 to 10

DATE RECEIVED : 13/09/2016
ANALYSIS REQUIRED : Full (ST-1)

ITEMS			RESULTS	DESIRABLE LEVEL PASTURE	DESIRABLE LEVEL GARLIC
pH(1:5 Water)*			5.9	5.5-7.5	6.0-7.5
pH(1:5 0.01M CaCl2)*			5.3		
Electrical Conductivity*	EC	µS/cm	43	< 300	< 470
TOTAL SOLUBLE SALT	TSS	ppm	141.9	< 990	< 1551
AVAILABLE CALCIUM*	Ca	ppm	792	2202	2202
AVAILABLE MAGNESIUM*	Mg	ppm	336.4	291	291
AVAILABLE SODIUM*	Na	ppm	90.15	< 186	< 186
AVAILABLE NITROGEN	N	ppm	1.14	26	200
AVAILABLE PHOSPHORUS*	P	ppm	1.9	30	80
AVAILABLE POTASSIUM*	K	ppm	182.52	253	253
AVAILABLE SULPHUR*	S	ppm	6.51	11 - 15	11 - 15
AVAILABLE COPPER*	Cu	ppm	1.45	2	3
AVAILABLE ZINC*	Zn	ppm	2.97	7	5-7
AVAILABLE IRON*	Fe	ppm	413	> 30	> 30
AVAILABLE MANGANESE*	Mn	ppm	72	> 20	> 20
AVAILABLE COBALT	Co	ppm	2.48	=> 1.0	=> 1.0
AVAILABLE MOLYBDENUM	Mo	ppm	0.16	> 0.5	> 0.5
AVAILABLE BORON*	B	ppm	0.35	0.6-1.0	1.0-1.5
TOTAL ORGANIC MATTER*	OM	%	8.0	6 - 10	6 - 10
TOTAL ORGANIC CARBON*	OC	%	4.46	3 - 5	3 - 5
TOTAL PHOSPHORUS*	TP	ppm	not required		
EXTRACTABLE ALUMINIUM*	Al	ppm	not required		
TOTAL NITROGEN*	TN	%	not required		
TOTAL CALCIUM	TCa	ppm	not required		
TOTAL MAGNESIUM	TMg	ppm	not required		
CHLORIDE	Cl	ppm	not required		
AVAILABLE SILICA	Si	ppm	not required		

*This laboratory has been awarded a Certificate of Proficiency for specific soil and plant tissue analyses by the Australasian Soil and Plant Analysis Council (ASPAC). Test for which proficiency has been demonstrated are highlighted in this report.

SWEP Analytical Laboratories
45 - 47 / 174 Bridge Road
Keysborough VIC 3173 Australia

Website: www.swep.com.au
E-mail: services@swep.com.au
Postal Address: P.O. Box 583 Noble Park VIC 3174

FILE NO : 1609121535 **LANDUSE:** PASTURE

ITEMS			RESULTS	DESIRABLE LEVEL
EXCHANGEABLE CALCIUM	Ca	meq/100 of soil	3.87	10.41
EXCHANGEABLE MAGNESIUM	Mg	meq/100 of soil	2.76	2.40
EXCHANGEABLE SODIUM	Na	meq/100 of soil	0.38	< 0.80
EXCHANGEABLE POTASSIUM	K	meq/100 of soil	0.46	0.80
EXCHANGEABLE HYDROGEN	H	meq/100 of soil	13	
ADJ. EXCHANG. HYDROGEN	H	meq/100 of soil	5.55	< 2.40
CATION EXCHANGE CAPACITY	CEC	meq/100 of soil	20.47	
ADJUSTED CEC	Adj.CEC	meq/100 of soil	16.02	
EXCH. SODIUM PERCENTAGE	ESP		1.86	< 5
CALCIUM / MAGNESIUM RATIO	Ca/Mg		1.4	2 - 4
BASE SATURATION PERCENTAGE	BSP		37	

ITEMS		PERCENTAGE OF ADJUSTED CEC	DESIRABLE LEVEL
EXCHANGEABLE CALCIUM	Ca	24.2	65-70%
EXCHANGEABLE MAGNESIUM	Mg	17.2	12-15%
EXCHANGEABLE SODIUM	Na	2.4	0.5-5%
EXCHANGEABLE POTASSIUM	K	2.9	3-5%
EXCHANGEABLE HYDROGEN	H	53.4	<20%

PREVIOUS APPLICATIONS (IF APPLICABLE)		DATE OF APPLICATION
GYPSUM APPLIED	t/ha	
LIME APPLIED	t/ha	
DOLOMITE APPLIED	t/ha	
Magnesium Sulphate	kg/ha	

@ Exchangeable Percentage in Relation to Ca, Mg, Na, K

SWEP Analytical Laboratories
45 - 47 / 174 Bridge Road
Keysborough VIC 3173 Australia

Website: www.swep.com.au
E-mail: services@swep.com.au
Postal Address: P.O. Box 583 Noble Park VIC 3174

DATE:	29/01/2018	**LAND USE:**	Garlic
NAME:	Lauren Toussaint	**PADDOCK:**	Rale Paddock
ADDRESS:	1695 Carlisle Rd.	**SAMPLE REC:**	22/01/2018
	CARLISLE RIVER VIC 3239	**E-MAIL:**	lauren.toussaint@bigpond.com

NTS

ALBRECHT CATEGORY	YOUR LEVEL	IDEAL LEVEL	NUTRIENT STATUS LOW / MEDIUM / HIGH
CEC	7.67		
TEC	15.04		
Paramagnetism	60	200 +	LOW
pH-level (1:5 water)	4.80	6.3	LOW
Organic Matter (IR Gas Anal.)	9.85 %	4 - 10 %	MEDIUM
Conductivity (1:5 water)	0.071 mS/cm	0.1 - 0.2 mS/cm	LOW
Ca / Mg Ratio	8.00 :1	5.67 :1	MEDIUM
Nitrate-N (KCl)	21.1 ppm	10 - 20 ppm	MEDIUM
Ammonium-N (KCl)	2.6 ppm	10 - 20 ppm	LOW
Phosphorus (Mehlich III)	10 ppm	50 - 70 ppm	LOW
Calcium (Mehlich III)	1290 ppm	2046 ppm	LOW
Magnesium (Mehlich III)	97 ppm	217 ppm	LOW
Potassium (Mehlich III)	71 ppm	176 - 293 ppm	LOW
Sodium (Mehlich III)	28 ppm	17 - 52 ppm	MEDIUM
Sulphur (KCl)	4 ppm	30 - 50 ppm	LOW
Aluminium (Mehlich III)	9.8 ppm	< 7 ppm	MEDIUM
Silicon ($CaCl_2$)	12 ppm	> 100 ppm	LOW
Boron (Hot $CaCl_2$)	0.34 ppm	1 - 3 ppm	LOW
Iron (DTPA)	90 ppm	40 - 200 ppm	MEDIUM
Manganese (DTPA)	10 ppm	30 - 100 ppm	LOW
Copper (DTPA)	0.6 ppm	2 - 7 ppm	LOW
Zinc (DTPA)	6.8 ppm	5 - 10 ppm	MEDIUM
Molybdenum (TAE)	N/A	0.5 - 2 ppm	
Cobalt (TAE)	N/A	2 - 40 ppm	
Selenium (TAE)	N/A	0.6 - 2 ppm	
Texture	Sandy Soil		
Colour	Grey		
BASE SATURATION (Levels are not relevant in soils with a TEC below 5)			
Calcium	42.88 %	68.00 %	LOW
Magnesium	5.36 %	12.00 %	LOW
Potassium	1.22 %	3.00 - 5.00 %	LOW
Sodium	0.82 %	0.50 - 1.50 %	MEDIUM
Aluminium	0.72 %	0.50 %	MEDIUM
Hydrogen	49.00 %	10.00 %	HIGH

LAMOTTE/REAMS CATEGORY	YOUR LEVEL	IDEAL LEVEL	NUTRIENT STATUS LOW / MEDIUM / HIGH
Calcium	1113 ppm	1000 - 2000 ppm	MEDIUM
Magnesium	106 ppm	140 - 285 ppm	LOW
Phosphorus	5.02 ppm	20 - 80 ppm	LOW
Potassium	68.85 ppm	80 - 100 ppm	LOW

Explanatory Notes: The La Motte test gives an indication of the amount of plant available nutrients at the time of sampling.

5.0 PROPOSED FARMING ACTIVITY

5.1 GRAZING STOCK

Area currently used for grazing: 60Ha

Area of proposed grazing: 60Ha

Current stock numbers: 900 Dry Sheep Equivalent (DSE)

STOCK TYPE	No. of animals	Seasonal variation in stock numbers	Imported feed requirements
Beef cattle	20 breeders	20	n/a
	1 bull	1	
	20 yearlings	n/a	
	10 calves	10	
Sheep	90 breeders	90	
	1 ram	1	
	90 lambs	n/a	
Alpaca	1	1	

5.2 CROPPING

Area currently under cropping (ha)	Current crop	Areas of future cropping (ha)
0	0	Green manure 7.0
		Garlic 0.5

5.3 PASTURE RENOVATION

Method and timing of any pasture renovation/improvement works proposed to be carried out:

- Late Spring direct drill green manure crop.
- Following Autumn (after rain) over-sow area with pasture mix.

6.0 WATER

6.1 CURRENT WATER SUPPLY

Domestic water supply	Rain water tanks
Current number of dams and bores	9 dams
Number of waterways, seasonal creeks etc.	1 waterway
Annual rainfall	880 mm
Fire water supply	dams
Water supply for stock and/or cropping	Troughs gravity fed from dams

6.2 CREEKS, WETLANDS, WATERWAYS

- Gellibrand River – southern boundary
- Unnamed waterway through vegetated gully

Refer to site plan.

6.3 CREEKS, WETLANDS, WATERWAYS MANAGEMENT

- The creek separated from areas of pasture and stock with retention of bushland
- Post and wire stock exclusion fencing is progressively being installed across the whole of the property.
- The landholders maintain the land to the northern bank of the Gellibrand River.
- Dams within the property are progressively being fenced to exclude stock access.
- These outcomes are significant with the Environment Significance Overlay 3 – lakes, wetlands and watercourses – which applies to the Gellibrand River.

7.0 WEED MANAGEMENT

Weed location indicated in the attached existing conditions plan.

Weeds are identified having regard to:

- Declared noxious weeds – Catchment and Land Protection (CaLP) Act 1994 (Vic)
- Weeds of National Significance (WoNS) (Federal)
- Colac Otway Shire Significant Weeds list – Colac Otway Shire Foothills and Ranges

7.1 Weeds identified within the property

Common Name	Scientific name	Classification	Treatment	Timing	Frequency
Blackberry	*Rubus fruticosus*	CaLP Regionally controlled (C) WoNS	Chemical	December	Annual
Scotch Thistle/Heraldic thistle	*Onopordum acanthium*	CaLP Regionally controlled (C)	Chemical	Spring	Annual
Ragwort	*Senecio jacobaea*	CaLP Regionally controlled (C)	Chemical & Manual	Spring	Annual

7.2 Weeds - Potential

Weeds to be aware or vigilant for new appearance:

Common Name	Scientific name
African Boxthorn	*Lycium ferocissimum*
Cape Broom/ Montpellier Broom	*Genista monspessulana*
English Broom/Scotch Broom	*Cytisus scoparius*
Flax-leaved Broom	*Genista linifolia*
Spiny Broom	*Calicotome spinose*
Gorse	*Ulex europaeus*
Hawthorn	*Crataegus monogyna*
St John's Wort	*Hypericum perforatum*

7.3 Weeds Management Plan Actions/Timelines

YEAR	ACTION	WHEN	WHO	HOW	COMPLETED
1.	*Control Blackberry, Thistles & Ragwort*	December	Contractor	Chemical	Ongoing
	Control Ragwort & Thistles	At germination	Landholder	Manual	Ongoing
	Review Management Plan	Spring	Landholder		
2.	*Control Blackberry Thistles & Ragwort*	December	Contractor	Chemical	Ongoing
	Control Ragwort & Thistles	At germination	Landholder	Manual	Ongoing
	Fence off revegetation site	Autumn	Landholder		Autumn
	Review Management Plan	Spring	Landholder		
3.	*Control Blackberry, Thistles and Ragwort*	December	Contractor	Chemical	
	Control Ragwort & Thistles	At germination	Landholder	Manual	Ongoing
	Plant out revegetation site	Autumn	Landholder		Autumn
	Review Management Plan	Spring	Landholder		
4.	*Control Blackberry, Thistles and Ragwort*	December	Contractor	Chemical	
	Control Ragwort & Thistles	At germination	Landholder	Manual	Ongoing
	Fence off revegetation site	Autumn	Landholder		Autumn
	Review Management Plan	Spring	Landholder		
5.	*Control Blackberry, Thistles and Ragwort*	December	Contractor	Chemical	
	Control Ragwort & Thistles	At germination	Landholder	Manual	Ongoing
	Plant out revegetation site	Autumn	Landholder		Autumn
	Review Management Plan	Spring	Landholder		

Action	Timing	Year 2020	Year 2 2021	Year 3 2022	Year 4 2023	Year 5 2024
Chemical Control Blackberry Ragwort & Thistles	December	X	X	X	X	X
Manual Control Ragwort & Thistles	At Germination	X	X	X	X	X
Review/Update Management Plan	Spring	X	X	X	X	X
Fence off re-veg site	Autumn		X			
Plant out re-veg site	Autumn			X		
Fence off re-veg site	Autumn				X	
Plant out re-veg site	Autumn					X
Review & update plan for next 5 years	Spring					X

7.4 Weeds Management Strategy - Monitoring

- Visual checks to be completed throughout the year.
- Areas affected marked on farm map for contractor reference.
- Weed management plan to be updated/amended at time of review if required.

8.0 PEST ANIMAL MANAGEMENT

Pest animals include rabbits, cats, deer, hares, foxes and other declared pest animals in accordance with the CaLP Act. Rabbits and foxes are typically associated with blackberry and gorse for food and shelter and an integrated approach is required.

Management principles are: reduce numbers, destroy burrows and harbor, prevent reinvasion.

Appropriate management methods include: poisoning, fumigation, ripping off burrows, destruction of harbor, fencing, shooting.

All poisoning or shooting to comply with strictly with regulations and recommendations by DELWP.

8.1 Pest Animal Identification & Management

Pest animal species	Evidence on site such as burrows, scats, diggings	Control method for an integrated approach	Monitoring techniques	Timing of treatment or control	Treatment options over 3 years
Foxes	Den	Deep rip area	Visual	At evidence of pest animal found	Repeat control method as required

9.0 BIODIVERSITY & NATIVE VEGETATION

9.1 Native Vegetation Description

Bushland covers approx. 70 acres (28 hectares).
The steeper slopes and gullies within the site are generally vegetated with an intact canopy, shrub and ground layers.
Land either side of the smaller waterway and land adjacent to the Gellibrand River is vegetated.

CMA Catchment	Corangamite
Ecological Vegetation Classes	BioRegion
LF – Lowland Forest EVC 16 – Depleted	Otway Plain
H-RFF - Herb-rich Foothill Forest EVC 23 - Vulnerable	Otway Plain
RF – Riparian Forest EVC 18 – Least Concern	Otway Ranges
HW – Heathy Woodlands EVC 48 – Least Concern	Otway Plain
Annual Rainfall	880mm

Refer to EVC map images on following page:

9.2 Native Vegetation Protection

Bushland protection or scattered trees protection:

- All bushland is, or will be, fenced from stock.

9.3 Revegetation

Revegetation is important on this property for the purposes of:

- Stabilising some areas of erosion
- Removing blackberry infestation and replacing with appropriate species.
- As substantial areas of bushland are retained at the site, pest management at the edges is important and stock exclusion, however re-vegetation of large areas is not required.
- Providing shade for stock within paddocks.

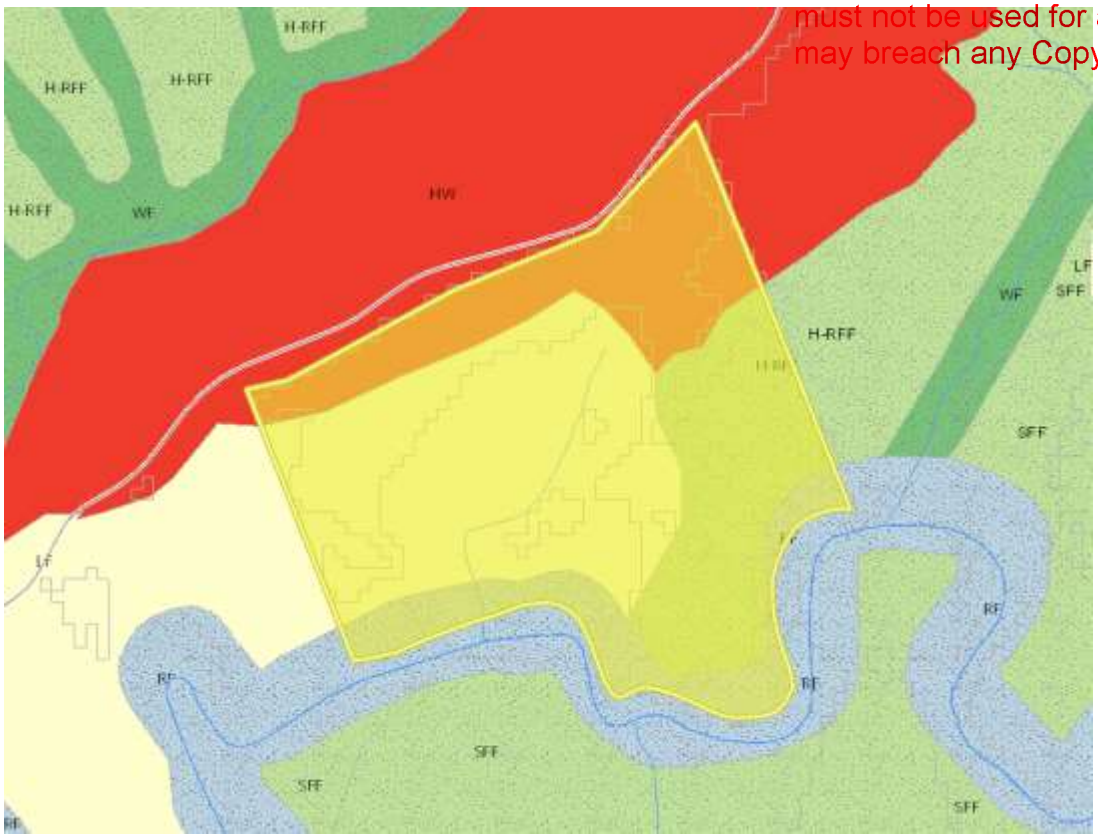


Figure 1: EVCs pre1750s (State Govt of Vic: http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit)

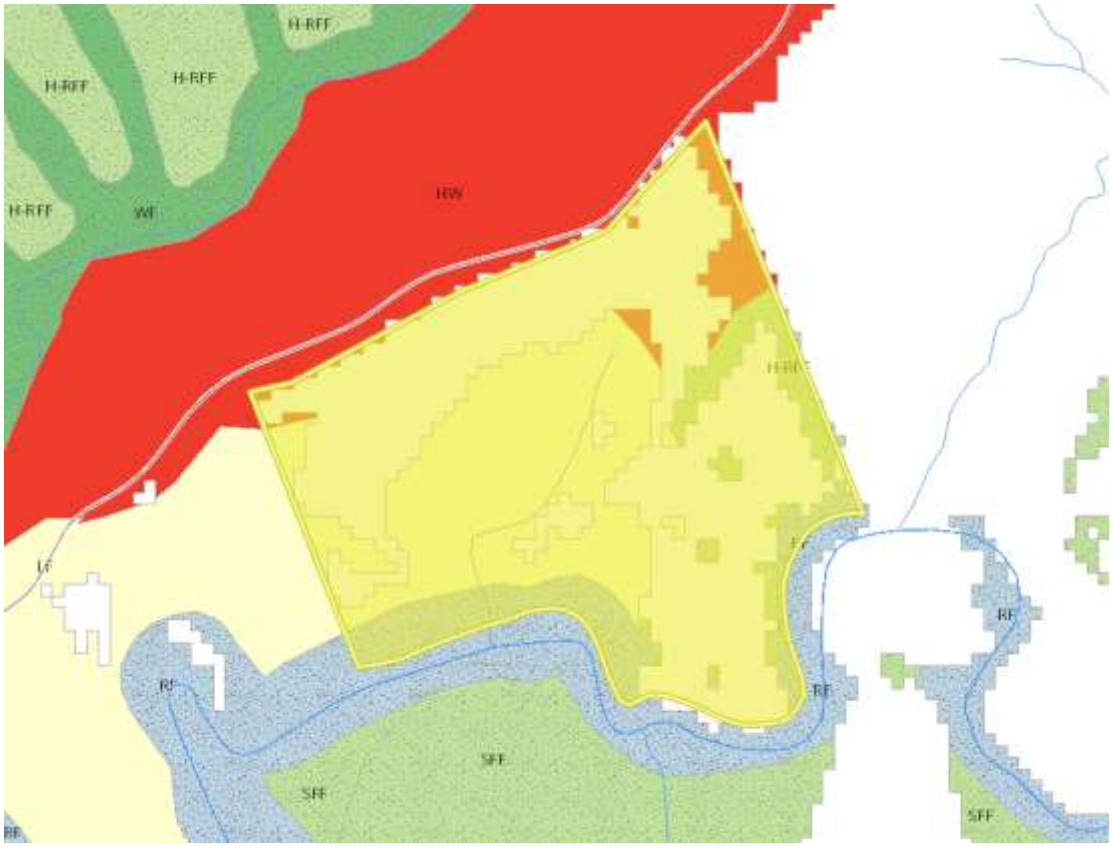


Figure 2: EVCs 2005 (State Govt of Vic http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit)

9.4 Revegetation Species List

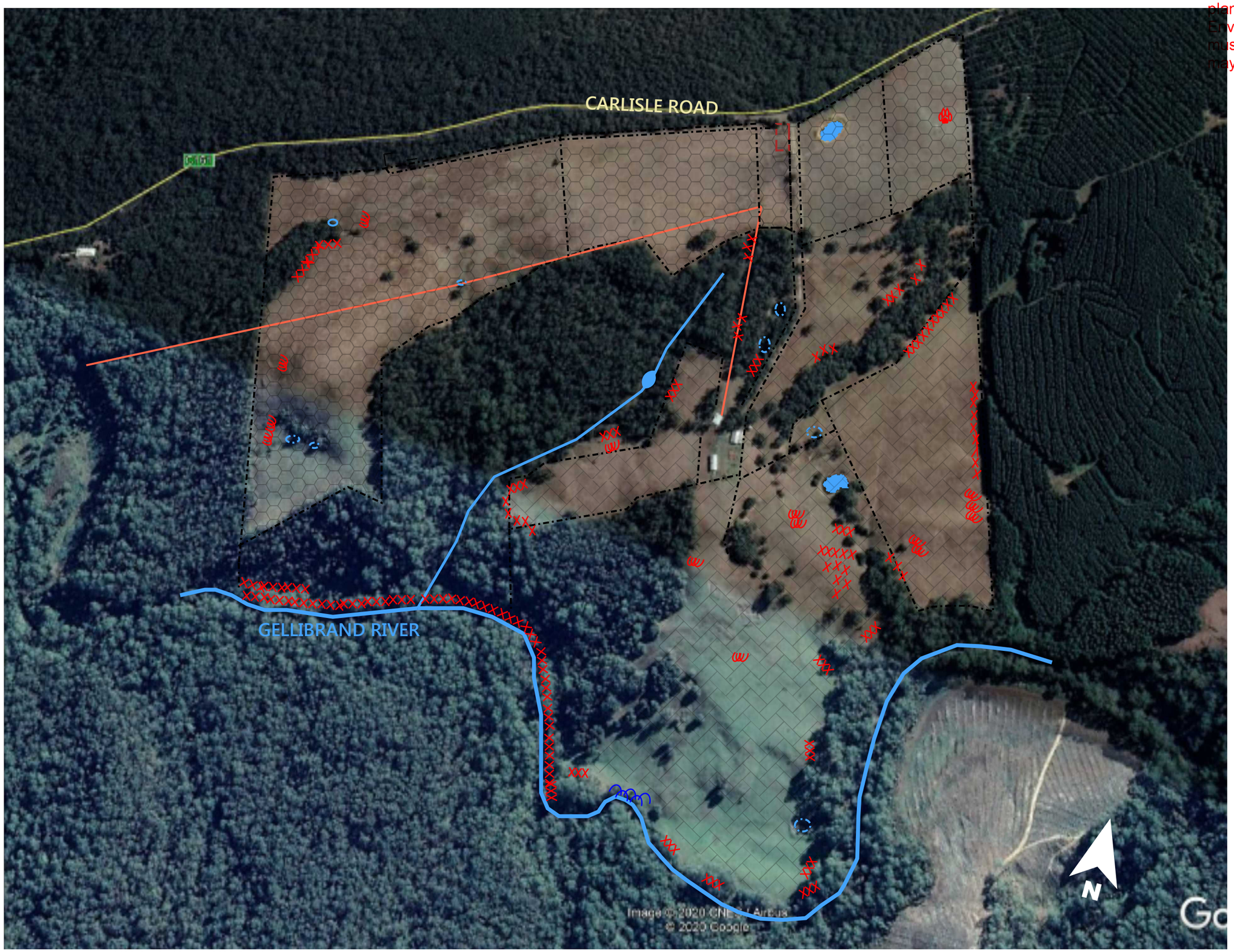
Common Name	Scientific Name*	Numbers*
Trees (Canopy)		
Messmate Stringybark	*Eucalyptus obliqua*	
Mountain Grey-gum	*Eucalyptus cypellocarpa*	
Manna Gum	*Eucalyptus viminalis*	
Narrow-leaf peppermint	*Eucalyptus radiata s.l.*	
Medium Shrubs & Understorey trees		
Blackwood	*Acacia Melanoxylon*	
Tree Everlasting	*Ozothamnus ferrugineus*	
Narrow leaf wattle	*Acacia mucronate ssp. longifolia*	
Prickly tea-tree	*Leptospermum continentale*	
Prickly currant bush	*Coprosma quadrifida*	
Small and Prostrate shrubs		
Olearia Speciosa	*Nettled daisy bush*	
Grasses/Ground covers/Climbers		
Austral cranesbill	*Geranium solanderi s.l.*	
Chocolate lily	*Anthropodium strictum s.l.*	
Slender tussock grass	*Poa tenera*	
Prickly starwort	*Stellaria pungens*	
Soft tussock-grass	*Poa morrisii*	
Common tussock grass	*Poa labillardierei*	

*species and numbers to be determined at the time of planting with regard to availability and specific conditions of site.

Other species listed in the relevant EVCs or Colac Otway Shire's indigenous species lists also appropriate.

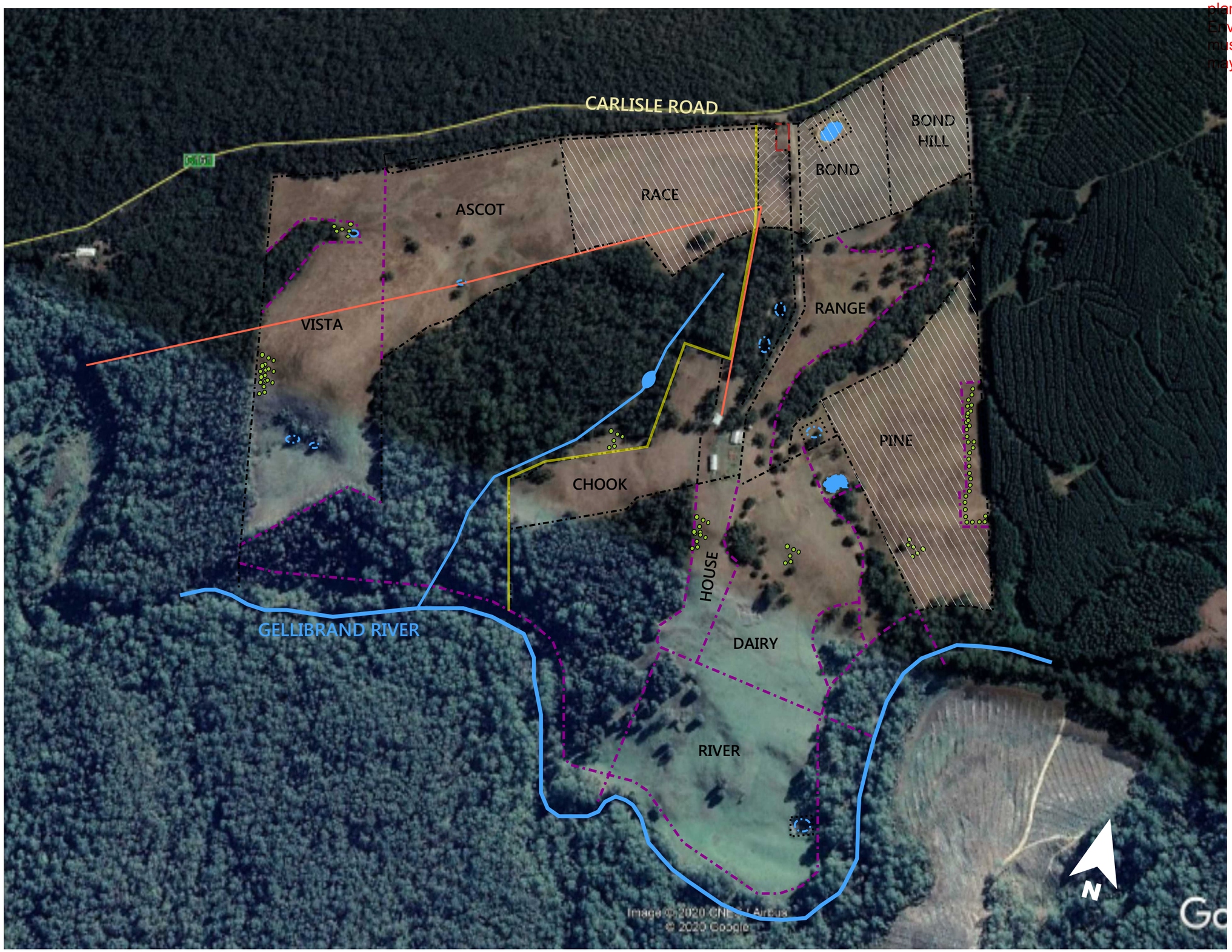
Prior to planting:

- Vegetation areas to be fenced off from stock or temporary measures installed for protection from stock until larger trees established.
- Weeds and pasture to be sprayed prior to planting to reduce competition. Two-three times prior preferable.
- Trees to be a minimum of 1.2-1.5m h at planting to resist stock/foraging competition.
- Plant guards required to protect seedlings from wildlife until established.



Google Earth Image (c) 2020 CNES/Airbus (c) 2020 Google

- existing buildings
- existing fencing
- existing services, power etc.
- existing dams, waterways, springs
- n/a — existing bores
- areas prone to flooding
- stockyards
- n/a — areas of salinity
- erosion areas including gullies
- soil type: sandy loam
- soil type: clay
- areas of pest plants
- areas of pest animals
- vegetation including paddock trees as shown by aerial image



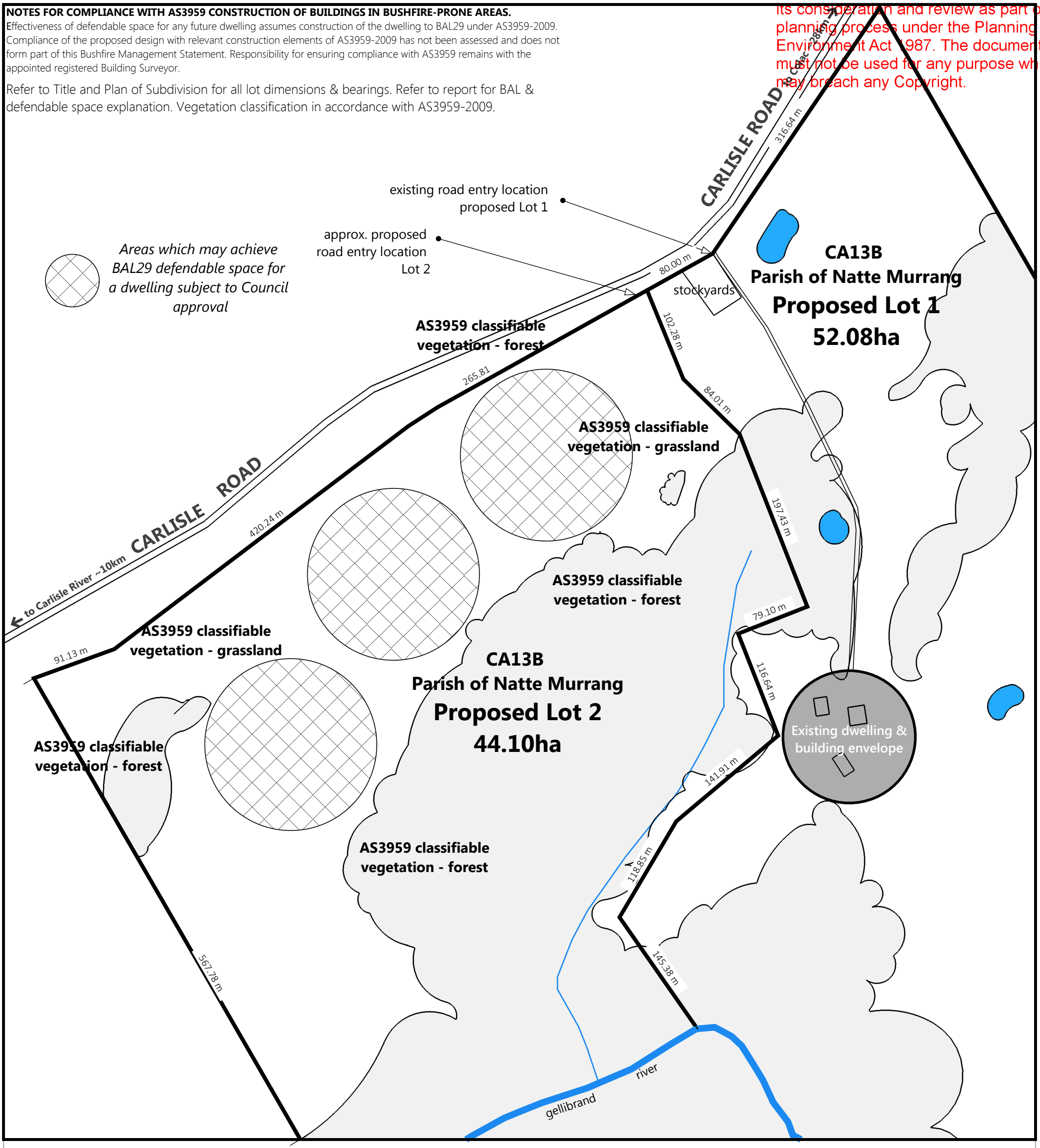
Google Earth Image (c) 2020 CNES/Airbus (c) 2020 Google

- proposed fencing
- proposed vegetation
- garlic
- cropping
- n/a — vegetation removal proposed
- proposed subdivision boundary
- n/a — proposed dams & bores

NOTES FOR COMPLIANCE WITH AS3959 CONSTRUCTION OF BUILDINGS IN BUSHFIRE-PRONE AREAS.

Effectiveness of defendable space for any future dwelling assumes construction of the dwelling to BAL29 under AS3959-2009. Compliance of the proposed design with relevant construction elements of AS3959-2009 has not been assessed and does not form part of this Bushfire Management Statement. Responsibility for ensuring compliance with AS3959 remains with the appointed registered Building Surveyor.

Refer to Title and Plan of Subdivision for all lot dimensions & bearings. Refer to report for BAL & defendable space explanation. Vegetation classification in accordance with AS3959-2009.



WATER SUPPLY

A 10,000 litre water supply tank will be provided for fire fighting purposes to any future dwelling and must comply with the following requirements:

1. Be stored in an above ground water tank constructed of concrete or metal.
2. Have all fixed above ground water pipes and fittings required for firefighting purposes made of corrosive resistant metal.
3. Include a separate outlet for occupant use.

Fire authority fittings and access must be provided as follows:

1. Be readily identifiable from the building or appropriate identification signs provided to the satisfaction of the relevant fire authority.
2. Be located within 60 metres of the outer edge of the approved building.
3. The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed.
4. Incorporate a separate ball or gate valve (British Standard Pipe (BSP 65 mm) and coupling (64 mm CFA 3 thread per inch male fitting).
5. Any pipework and fittings must be a minimum of 65 mm (excluding the CFA coupling).

DEFENDABLE SPACE

VEGETATION MANAGEMENT REQUIREMENT.

Defendable space is provided and is managed in accordance with the following requirements:

1. Grass must be short cropped and maintained during the delared fire danger period.
2. All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
3. Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
4. Plants greater than 10 cm in height must not be placed within 3 metres of a window or glass feature of the building.
5. Shrubs must not be located under the canopy of trees.
6. Individual and clumps of shrubs must not exceed 5 square metres in area and must be separated by at least 5 metres.
7. Trees must not overhang or touch any elements of the building.
8. The canopy of trees must be separated by at least 5 metres.
9. There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Unless specified in a schedule or otherwise agreed in writing to the satisfaction of the relevant fire authority.

EMERGENCY VEHICLE ACCESS DESIGN AND CONSTRUCTION.

Access for emergency vehicles will be provided to the any future dwelling and static water supply outlet and must comply with the following design requirements (including gates, bridges and culverts):

1. Fire authority vehicles should be able to get within 4 metres of the water supply outlet.

The following design and construction requirements apply:

1. All-weather construction.
2. A load limit of at least 15 tonnes.
3. Provide a minimum trafficable width of 3.5 metres.
4. Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically.
5. Curves must have a minimum inner radius of 10 metres.
6. The average grade must be no more than 1 in 7 (14.4%) (8.1 degrees) with a maximum of no more than 1 in 5 (20%) (11.3 degrees) for no more than 50 metres.
7. Dips must have no more than a 1 in 8 (12.5%) (7.1 degrees) entry and exit angle.

A turning area for fire fighting vehicles must be provided close to the building by one of the following:

1. A turning circle with a minimum radius of eight metres.
2. A driveway encircling the dwelling.
3. The provision of other vehicle turning heads - such as a T or Y head - which meet the specification of Austroad Design for an 8.8 metre Service Vehicle.

Where the length of access is greater than 200 metres,

1. Passing bays must be provided every 200 metres.
2. Passing bays must be a minimum of 20 metres long with a minimum trafficable width of 6 metres.