

From: [Rod Hancl](#)
To: [McCrossen, Samuel](#)
Cc: bobannie@tassie.net.au; bobannie@iinet.net.au
Subject: B&A Browning - Agricultural Report - Land Capability Assessment for "Rockciffe" Property
Date: Monday, 19 October 2020 11:23:06 AM
Attachments: [B&A Browning - Agricultural Report \(land Capability\) - July 2020.pdf](#)
[B&A Browning - Ag Report - Farm Management Plan \(Viticulture\) - July 2020.pdf](#)
[image001.jpg](#)

Hi Samuel

I have just obtained Annie Browning's verbal permission (i.e. by phone) to lodge on their behalf the Agricultural Report i.e. a Land Capability Assessment and other documentation.

I have completed both a Land Capability Report and Farm Management Plan in regards to rezoning from Significant Agricultural Zone to Rural Resource Zone

Please find attached the Land Capability Report

Please find attached the Farm Management Plan

Kind regards

Rod Hancl

Mob: 0409 909 728

On Monday, 19 October 2020, 11:04:11 am AEDT, McCrossen, Samuel
<samuel.mccrossen@planning.tas.gov.au> wrote:

<https://iplan.tas.gov.au/Pages/XC.Track.Assessment/SearchAssessment.aspx?id=779>

Regards,

Samuel

Samuel McCrossen

Planning Adviser

TPC_Logo_CMYK.jpg



Level 3 144 Macquarie Street Hobart TAS 7000
GPO Box 1691 Hobart TAS 7001

03 6165 6833

www.planning.tas.gov.au

CONFIDENTIALITY NOTICE AND DISCLAIMER: This email and any attachments are confidential and may be legally privileged (in which case neither is waived or lost by mistaken delivery). The email and any attachments are intended only for the intended addressee(s). Please notify us by return email if you have received this email and any attachments by mistake, and delete them. If this email and any attachments include advice, that advice is based on, and limited to, the instructions received by the sender. Any unauthorised use of this email and any attachments is expressly prohibited. Any liability in connection with any viruses or other defects in this email and any attachments, is limited to re-supplying this email and any attachments.

CONFIDENTIALITY NOTICE AND DISCLAIMER

The information in this transmission may be confidential and/or protected by legal professional privilege, and is intended only for the person or persons to whom it is addressed. If you are not such a person, you are warned that any disclosure, copying or dissemination of the information is unauthorised. If you have received the transmission in error, please immediately contact this office by telephone, fax or email, to inform us of the error and to enable arrangements to be made for the destruction of the transmission, or its return at our cost. No liability is accepted for any unauthorised use of the information contained in this transmission.

Agricultural Report

“Rockcliffe” Property

Bob & Annie Browning

Swansea

Tasmania

Land Capability Assessment

for a

Zoning Application

August 2020

Rod Hancl, B.Ag.Sc. (Hon)

Agronomy Dynamics

PO Box 241, New Norfolk, 7140.

Table of Contents

	Page
1. Overview	4
2. Summary of Agricultural Report	5
3. Introduction	6
4. Land Capability Assessment	7
5. Conclusion	14
6. Appendix	
6.1 theList, ESRI Imagery map identifying the “Rockcliffe” property. <i>The map displays the ‘boundary line with accuracy’ filter.</i>	16
6.2 theList, ESRI Imagery map identifying the “Rockcliffe” property. <i>The map displays the ‘Tasmanian Interim Planning Scheme Zoning’</i>	17
6.2.1 Zone Maps 55K rural pdf. – Glamorgan Spring Bay Council <i>The map displays an adjusted ‘Tasmanian Interim Planning Scheme Zoning’ and identifies properties that have changed from Agricultural Zone to the Rural Zone next to the ‘Rockcliffe’ property.</i>	18
6.3 theList, ESRI Imagery map identifying the “Rockcliffe” property. <i>The map displays the ‘5-metre contours’</i>	19
6.4 theList, ESRI Imagery map identifying the “Rockcliffe” property <i>The map displays the ‘Land Capability’ Filter’ identifying Class 6, 5 and 4 land.</i>	20
6.5 theList, ESRI Imagery map identifying the “Rockcliffe” property. <i>The map displays the ‘Tasmanian Interim Planning Scheme’ filter identifying ‘Land slide Hazard Areas’ and ‘Waterway and Coastal Protection areas’</i>	21
6.5.1 theList, ESRI Imagery map identifying the “Rockcliffe” property. <i>The map identifies the July 2020 assessed Land Capability classification. The map displays the ‘Numbered Reference Points’ where Photos have been captured for cross referencing throughout the report</i>	22

6.6	theList, Hillside Grey map identifying the “Rockcliffe” property. <i>The map displays the ‘Tasmanian Interim Planning Scheme’ overlay filter identifying ‘Land slide Hazard Areas’ and ‘Waterway and Coastal Protection areas’ The map displays the ‘5-metre contours’</i>	23
6.6.1	theList, Hillside Grey map identifying the “Rockcliffe” property. <i>The map identifies the July 2020 assessed Land Capability classification. The map displays the ‘Numbered Reference Points’ where Photos have been captured for cross referencing throughout the report.</i>	24
6.7	theList, ESRI Imagery map identifying the “Rockcliffe” property. <i>This map displays the Tas Water – Flood Inundation Summary</i>	25
6.8	theList, ESRI Imagery map identifying the “Rockcliffe” property. <i>The map displays the ‘Soil Vulnerability – Water Logging Hazard’</i>	26
6.9	theList, ESRI Imagery map identifying the “Rockcliffe” property. <i>The map displays the ‘Soil Drainage’</i>	27
7.	References and Bibliography	28

1. Overview

The following document forms part of an ‘Zone Application’ prerequisite for the “Rockcliffe” property, at Swansea, to amend the land assessment from a Significant Agriculture Zone (Agricultural Zone) to the Rural Resource Zone (Rural Zone) that are currently applied under the Glamorgan Spring Bay Interim Planning Scheme 2015.

A ‘Desktop’ study of the of the Tasmanian Government web site, ‘the List’ (DPIWE 2020) provides a good summary of the available land information and identifies that the 44.77 hectare ‘Rockcliffe’ property (Appendix 6.1) has been zoned as ‘Significant Agriculture’ under the ‘Tasmanian Interim Planning Scheme Zoning’ (Appendix 6.2). The “Rockcliffe” property has a presumed ‘Land Capability’ classification that ranges from Class 4 through to Class 5 and Class 6 (Appendix 6.4). The land encompasses a “Waterway Protection Area” which flows intermittently (Appendix 6.5). “livestock can graze and get water from waterways on private property without a permit” (Edo Tasmania 2016). The hilly topography on the property rises from 10 to 25m above the river flats running south to north along the western third of the land (Appendix 6.3). This hilly land has zones that are identified as “Land Slide Hazard Area” (Appendix 6.5). The River Flats area topography falls over 10 m and, in theory, appears not to be subject to flooding from the Meredith River (Appendix 6.7), but the soils are vulnerable to medium to high “Water Logging Hazard” (Appendix 6.8) and are defined as “Imperfectly drained” (Appendix 6.9).

The DIPIWE ‘Land Capability’ current assessment (Appendix 6.4) has identified Class 5 land that possesses a large gradient and covered by native bush (Appendix 6.3) and this could certainly be associated with Class 6 land. Class 6 land capability classification identifies acreage that is marginally suited to grazing due to severe limitations (e.g. high risk of erosion) or other limitations (e.g. slope / rockiness) that severely limit agricultural use. The Hillside Grey map defines key features and outlines on the “Rockcliffe” property that need further investigation (Appendix 6.6). These include the potential flooding from upslope run-off and the apparent high risk of flooding due to the ‘dog’s leg’ bend in the Meredith River on the East side of the property and the associated low topography of the land (Appendix 6.7).

In Tasmania, the Department of Primary Industries, Water and Environment (DPIWE) have been actively involved for many years in producing reference literature and scaled maps (1:100 000) for Land Capability assessment. DPIWE has produced a ‘Freycinet - Modelled Land Capability Classes map’ (Lynch 2002) that includes the “Rockcliffe” property. These maps have been utilized as reference material for the Tasmanian Government web site, the List, which provides a Land Information Systems platform, for Tasmania. “At the 1:100 000 map scale, the minimum area which can be adequately depicted on the map represents approximately 64 ha on the ground” (Noble 1992, Grose 1999). Subsequently, the 44.77-hectare “Rockcliffe” property ‘Zoning Application’ will require an updated ‘Land Capability’ assessment (i.e. refer Section 4) and this involved a ‘Field Assessment’ that was undertaken on the 9th July 2020 (i.e. by the author).

Land capability should not be confused with land suitability. In Tasmania land capability is a classification system that is used to rate the land for grazing and cropping relevance. Land suitability by comparison considers a more detailed collection of resource information. “Despite the inherent subjectivity in the methodology, land capability remains the accepted form of land evaluation. In Tasmania it should be an essential input to all planning decisions to ensure that long-term sustainability and correct management of agricultural land is achieved” (Grose 1999).

2. Summary of the Agricultural Report

The following report is a ‘Land Capability’ assessment of the “Rockcliffe” property, at Swansea, on the East Coast of Tasmania. The land is located at the northern side of the township, bound in part, by the Tasman highway and the Meredith River (Appendix 6.3). This report will provide clarity to the Glamorgan Spring Bay Planning Scheme 2015 prerequisites for a planned zoning application for the property from Significant Agriculture Zone (Agricultural Zone) to Rural Resource Zone (Rural Zone).

3. Introduction

The “Rockcliffe” property consists of 44.77 ha and this meets the 40-ha minimum lot size guideline required within the Rural Resource Zone (Rural Zone). “A lot of 40 ha is considered large enough to discourage rural living type development and provide a buffer to rural industries and adjoining areas within the Agricultural Zone” (Department of Justice 2017)

Agriculturally the “Rockcliffe” property has historically consisted of uncultivated dryland grazed pasture (i.e. non irrigated) since the 1960’s (Personal comm. Bob Browning, July 2020). Traditionally renovation of the pasture (i.e. seed / fertiliser) has been by either direct drilling or broadcast type farming practices or relied on native grasses. The property can be divided into two distinctly different landscapes. These landscapes encompasses river flats area that consist of pasture (60%) and a hilly area that consists of remnant native bush (40%). The elevated topography on the western third of the property is covered with the typical light woodlands of the East Coast that consists mainly of Eucalyptus White Gums, Peppermint Gums, Black Wattles, Gorse, Sags and Prickly Box etc. This countryside would be lucky to carry (1/2 DSE / ha) by contrast to the river flats expanse that would have a much higher stocking capacity in a good dry-land season.

The “Rockcliffe” property is in a low rainfall area that often endures periods of drought interrupted by large rainfall events. The Bureau of Metrology data suggest a long-term average rainfall for Swansea of 593.3 mm (i.e. approx. 24 inches) (i.e. Swansea Post Office, *data set 1884 – 2008*) but annual precipitation during 2019 -2020 year was much below this long term average. The BOM long term climate change forecast for the East coast of Tasmania identifies with high confidence that the average daily temperature will rise, more hot days and an “increased intensity of extreme rainfall events” are projected for ‘The Southern Slopes Tasmania East sub cluster’ (<http://www.bom.gov.au>). The land is not limited by availability of water for agricultural outcomes as it is located within the Swan Valley Irrigation Scheme and has a 100 Megalitres allocation from the scheme.

4 Land Capability Assessment

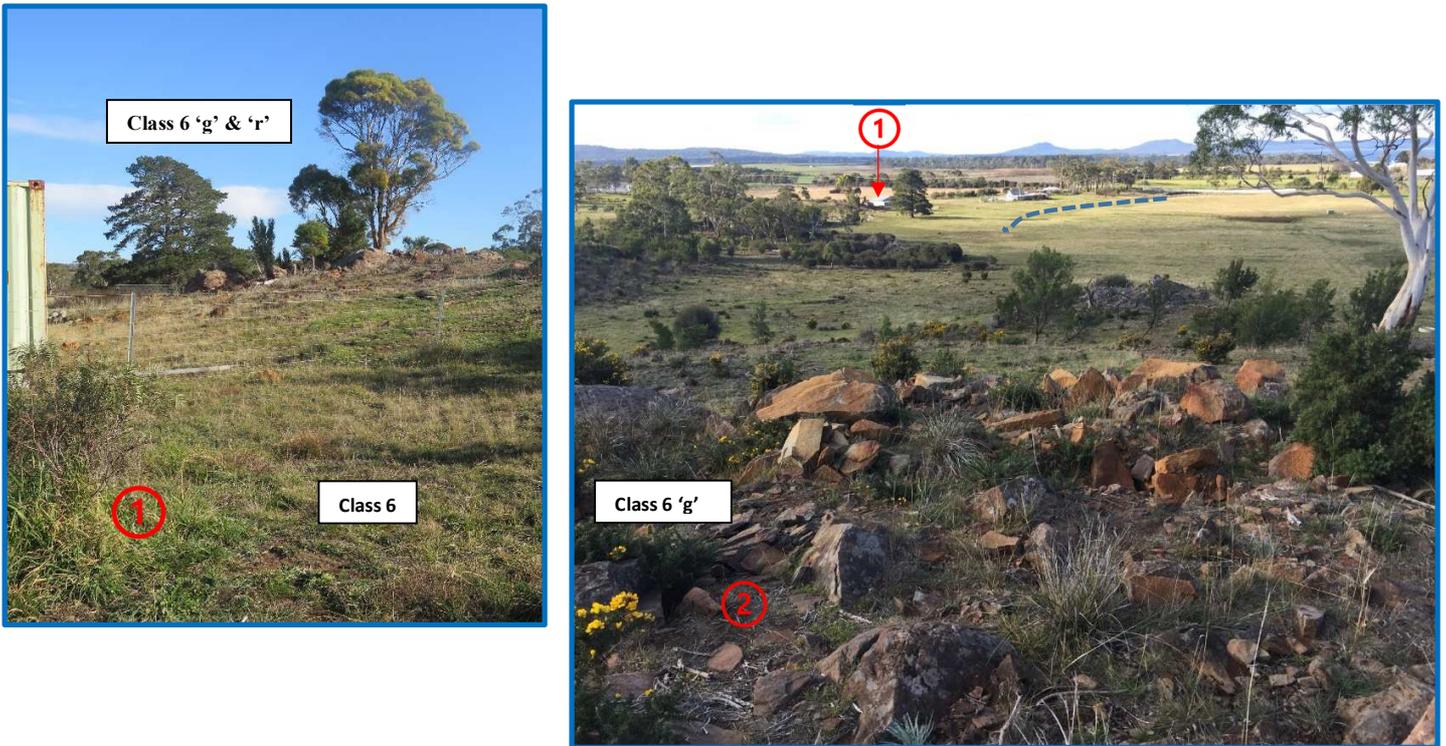
There is no doubt when traversing the topography of the “Rockcliffe” property it becomes apparently clear that the ‘Land Capability’ classifications presented by ‘the List’ data set are not an accurate presentation of the true facts. The Class 6 classification identified on the property encompasses much more of the land area than alluded by the available ‘Land Information System’ and in fact encompasses approximately all the acreage described as Class 5 land (Appendix 6.4).

The complete elevated topography of the western third of the property can be considered Class 6 Land (Appendix 6.5.1 and Appendix 6.6.1). This is land that is “marginally suitable for grazing because of severe limitations. This land has low levels of production, high risk of erosion, low natural fertility or other limitations that severely restrict agricultural use. This land should be retained under its natural vegetation cover” (Grose 1999). This hilly area is covered with various size gravel, some rocks, and rocky outcrops on the soil surface and through the profile. This Class 6 land can be characterized to have a dominate sub class rating for the soil of ‘g’ (coarse fragments) and some areas of sub class rating ‘r’ (rockiness) (refer to Pictures #1, #2, #3 & #4, #5 & #6).

Picture #1 & #2. Identifying Class 6 land with sub class rating for the soil of ‘g’ (coarse fragments) and ‘r’ (rockiness)



Picture #3. Class 6 land fundamentally starts from the last building i.e. the beginning of elevated topography of the property on the northern boundary. ('Numbered Reference Point #1. Appendix 6.5.1 & Appendix 6.6.1).



Picture #4. Picture identifies Class 6 'g' land. Numbered Reference Point #2 (Appendix 6.5.1 & Appendix 6.6.1). This picture identifies the movement of upslope heavy rainwater run-off into the "Waterway Protection Area" (i.e. blue dotted line in the picture background) (Appendix 6.5). (i.e. with Numbered Reference Point #1 in the distance).

Picture #5. Picture identifies Class 6 'g' land. Numbered Reference Point #3 (Appendix 6.5.1 & Appendix 6.6.1).

(i.e. with Numbered Reference Point 6 in the distance on the river flat).

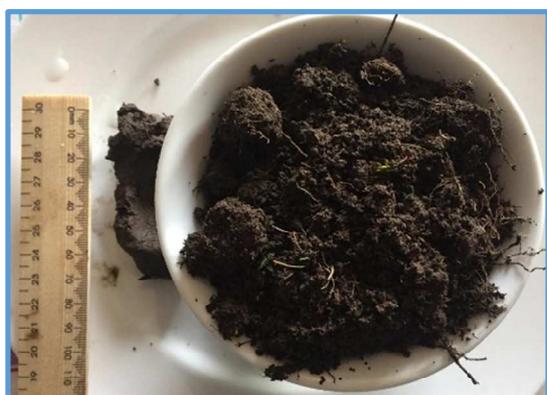


Picture #6. Picture identifies Class 6 land, looking south along the western boundary from Numbered Reference Point #3 (Appendix 6.5.1 and Appendix 6.6.1).



The soil type on the elevated part of the “Rockcliffe” property can be considered a shallow dark-brown dolerite loam-clay soil type (Picture #7 & #8). (i.e. Jurassic igneous rock. Corbett 2015).

Picture #7 & #8. Dark-brown dolerite loam-clay soil. Feels smooth & spongy (i.e. when manipulated with water into a ball). Ribbon length 25 to 40 mm. (Soil Sampled at ‘Numbered Reference Point #2, Appendix 6.5.1).



The hilly area of the western side of the property has been ripped along the 10 m, 15 m and 25 m contour line to a depth of 500 to 600 mm. This has been designed to mitigate any potential water run-on damage from large heavy rainfall events. “Run-on is the flow of surface water from up slope onto a paddock that can lead to erosion” (Hamlet 2002) This farm management technique potentially allows water infiltration into the soil profile and reduces soil washing causing erosion outcomes (personal comm. Bob Browning, July 2020). (refer Picture #9)

Picture #9. Identifies rip lines at the 10 m contour near at the northern boundary of the property. ('Numbered Reference Point #1 in background of the picture, Appendix 6.5.1 & Appendix 6.6.1).



The River Flats area of the “Rockcliffe” property can be considered Class 5 land (Appendix 6.5.1 and Appendix 6.6.1). Class 5 land has “slight to moderate limitations to pastoral use. This land is unsuitable to cropping, although some areas on easier slopes may be cultivated for pasture renewal. The effects of limitations on the grazing potential may be reduced to applying appropriate soil conservation and land management practices (Grose 1999). The literature identifies these River Flats can be stated to have to sub class ratings of ‘g’ (coarse fragments) and certain areas of this land would also have a sub class rating of ‘f’ (flooding).

The main soil type on the river flats area of the “Rockcliffe” property can be considered a red-brown gravelly sandy-loam soil (Picture #10 & #11). (i.e. Quaternary sediment. Corbett 2015).

Picture #10 & #11. Brown gravelly sandy-loam soil. Feels slight grittiness & spongy (i.e. when manipulated with water into a ball). Ribbon length 10 to 15 mm. (Soil Sampled at ‘Numbered Reference Point #4’, Appendix 6.5.1).



This grazing land can be characterized to have a dominate sub class rating for the soil of ‘g’ or has ‘limitations caused by excess amounts of coarse fragments (particles of rock 2-600 mm in size), including gravel, pebbles and stone, which impact on machinery, damage crops or limit growth. Coarse fragments may occur on the soil surface or throughout the profile” (Grose 1999). (refer Pictures #12 & #13).

Picture #12. Picture identifies river flat alluvial gravel of various size (i.e. picture taken near southern boundary)



Picture #13. Picture identifies river flat alluvial gravel of various size (i.e. picture taken the eastern boundary (i.e. lowest topographic land area). (note the red pen in the picture)



Areas of the river flats can be characterized to have a dominate sub class rating for the land of ‘f’ or has “limitations created through the surface accumulation of water either from overbank flow from rivers, run-on from upslope areas or because areas lies in a topographic depression” (Grose 1999).

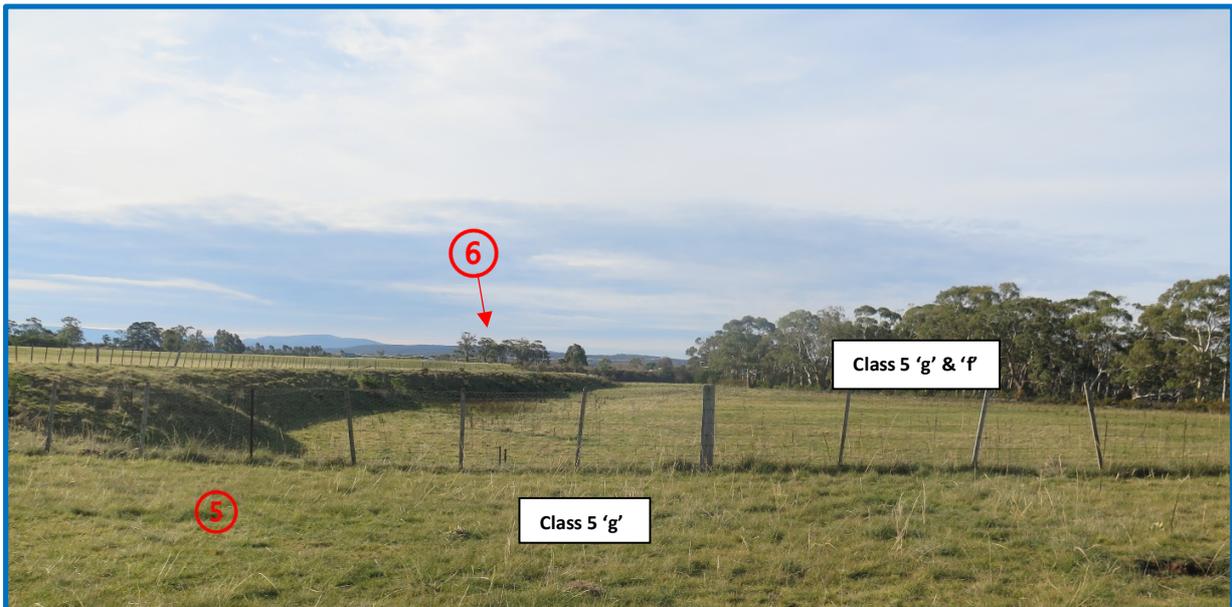
The “Rockcliffe” property suffer flooding from both upslope run-off after heavy rainfall events and directly from the Meredith river flooding. In the northern end of the property upslope run-off causes flooding, due to the narrows of the Tasman Highway bridge, via the ‘Waterway Protection’ area (Appendix 6.5.1 & Appendix 6.6.1) (i.e. refer Picture #4). The southern end of the property floods from upslope run-off through defined channels that eventually encounters a flooding Meredith river in the low topography of the property (i.e. bend in river) (personal Comm. Bob Browning July 2020) (i.e. refer Picture #14 & #15). The Hillside Grey maps (Appendix 6.6 and Appendix 6.6.1) highlights the water channels meandering on the southern river flats to the lowest topography of the property near the ‘dog leg’ in the Meredith Rivers (refer picture #14).

The higher topography areas of the River Flats, located centrally on the property, Class 5 classification suggests that it is “only really suited to dryland grazing and low economic return, but such areas may have soils ideally suited to viticultural production with a high economic return” (Dep. of Justice 2017). This sandy loam soil could be further investigated by a Farm Management Plan form a small boutique vineyard opportunity (refer picture #16).

Picture #14. Picture identifies Class 5 land. Numbered Reference Point #6 (Appendix 6.5.1 & Appendix 6.6.1). This land would have the sub class of ‘g’ and ‘f’’. Flooding water travels along the channel depression from right to left of photo accumulating in lower river flats and merges with rising river flood water. Numbered Reference Point #4 & #5 can be observed in the distance (Appendix 6.5.1 & Appendix 6.6.1).



Picture #15. Picture identifies Class 5 land. Numbered Reference Point #5 (Appendix 6.5.1 & Appendix 6.6.1). This land would have the sub class of 'g' and 'f'. Flooding water accumulating in lower river flats from run-on from elevated areas and a flooding Meredith river. The Meredith river is in right hand side of picture beyond tree line. Numbered Reference Point #6 can be observed in the distance (Appendix 6.5.1 & Appendix 6.6.1).



Picture #16. Picture identifies Class 5 land. This is look north from 'Numbered Reference Point #6' (Appendix 6.5.1 & Appendix 6.6.1). This land would have the sub class of 'g'. But with good management could be considering for perennial cropping like viticulture (wine grapes).



5 Conclusion

The “Rockcliffe” property is not prime agricultural land or integral to the management of a larger farm holding in the Agricultural zone. Prime agricultural land has a land capability classification of either Class 1, Class 2, or Class 3. The DPIWE ‘Land Information System’ identifies the “Rockcliffe” property as acreage that has been classified as Class 4, Class 5, or Class 6 land at the scale of 1:100 000 (Appendix 6.4). But the literature also identifies that at this scale of land class modelling that the data set would only depict 64 ha accurately on the ground (Noble 1992, Grose 1999).

The 44.77 ha “Rockcliffe” property, under closer field inspection, was identified to have only a land capability of either Class 5 or Class 6 (Appendix 6.5.1 and Appendix 6.6.1). The Class 5 land had a sub class rating of ‘g’ (coarse gravel) and encompassed a Protected Waterway area and the southern river flats area are inundated with water after heavy rainfall and hence these zones have an additional sub class rating of ‘f’ (flooding). This sub rating would cause poor drainage and water logging. The Class 6 land would have a general sub class rating of ‘g’ (gravel) and some areas of ‘r’ (rockiness). Hamlett (200) identifies that some of the major constraints to agricultural use of the land in Tasmania include coarse gravel fragments, poor drainage, frost, and flooding. It can be stated on this property there are significant constraints to agriculture outcomes occurring on the land.

In general, there was no Class 4 land identified on the “Rockcliffe” property. Class 4 land is “primarily suitable for grazing but which could be used for occasional cropping” (Grose 1999). The land on this “Rockcliffe” property presents as having a high risk of erosion from rainfall event in this East Coast region and the gravelly nature of the soil profile that would be potentially hard on farming implements and equipment applying cropping outcomes.

Agriculturally the “Rockcliffe” property has not been cultivated for over 50 years and most of the property is probably best managed by grazing stock due to the limited potential of the land. Pasture renewal by light cultivation on the easier higher river flat areas may be possible but ideally

renovation by direct drilling would be a good farm management practice on these sandy loam soils. But 'Land Capability' classifications does not reflect the agricultural potential of Class 5 land as it is "only really suited to dryland grazing and low economic return, but such areas may have soils ideally suited to viticultural production with a high economic return" (Dep. of Justice 2017). These viticultural ventures are notable on the East Coast region of Tasmania and to the north and south of the Swansea township region. "The provision of the Rural Zone acknowledges that the land may be able to support some agriculture, but the land is of lower significance as compared to the Agricultural Zone" (Dept. of Justice 2017)

The "Rockcliffe" property is a buffer zone countryside described by the literature that does not in general lure rural living type developments due to the size of the allotment and the characteristics and topography of the land. "The key difference between the two zones is how non-agricultural activity is managed" (Dept. of Justice 2017) and this property has limited agricultural potential due to significant constraints on the land.

The "Rockcliffe" property presents as a buffer zone property to the township of Swansea and the adjoining northern agricultural (i.e. grazing & cropping), horticultural (i.e. walnuts) and viticultural (i.e. wine grapes) ventures in the Significant Agricultural Zone (Agricultural Zone). Due to the nature and the topography of this "Rockcliffe" property countryside it is best described as land that fits into the Rural Resource Zoning (Rural Zone) and a change in zoning will not affect existing or future agricultural activity from occurring.

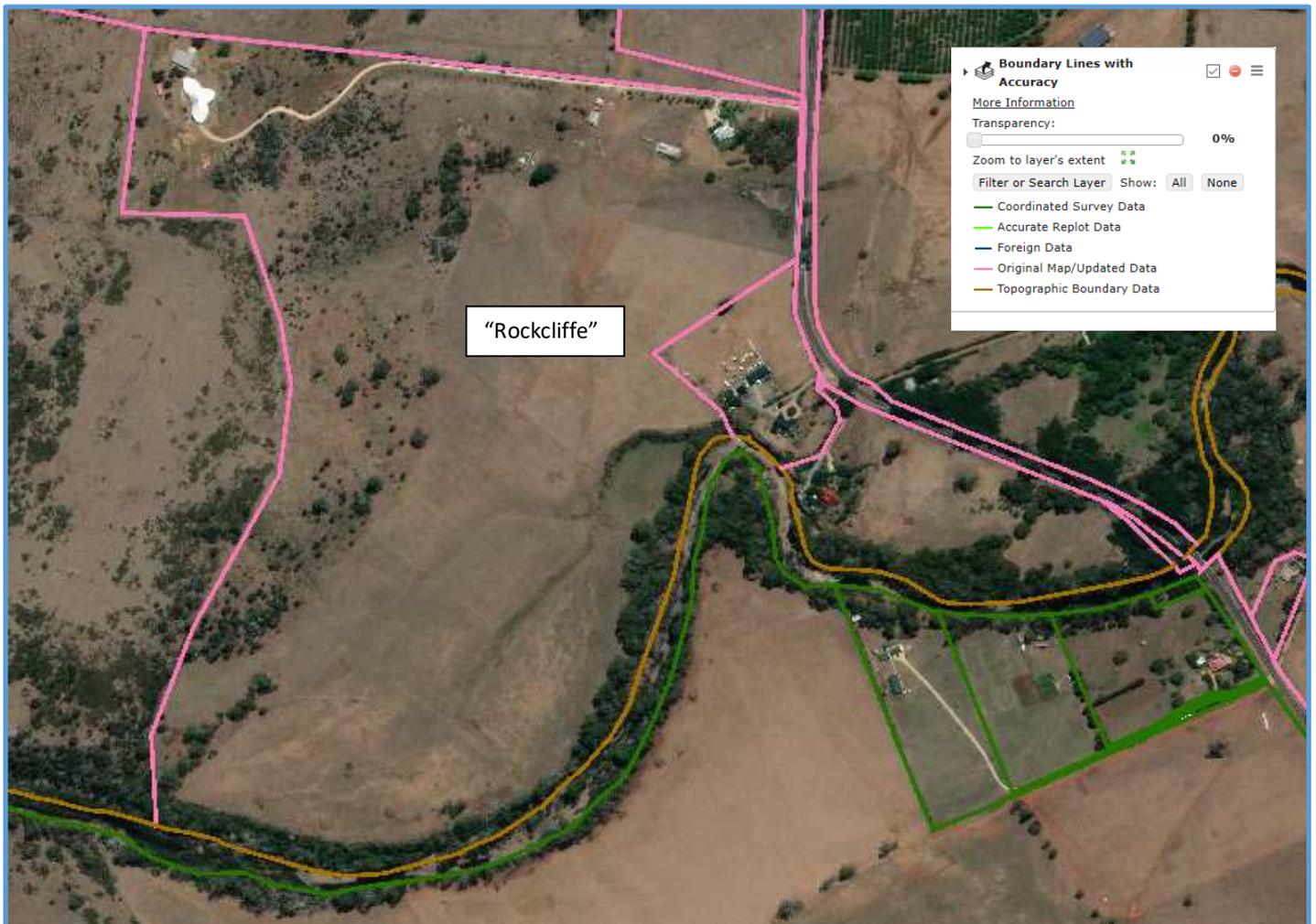
Notably adjacent land holdings to the "Rockcliffe" property, between the Meredith River and the Tasman Highway, have once been identified as Significant Agricultural Zone land (Agricultural Zone (Appendix 6.2)). But further research of the Glamorgan Spring Bay Council 'Zone Maps' (Appendix 6.2.1) identifies that these two properties have had a change in zone planning to the Rural Resource Zoning (Rural Zone).

6. Appendix

6.1 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘boundary line with accuracy’ filter.

<https://maps.thelist.tas.gov.au/listmap/app/list/map>

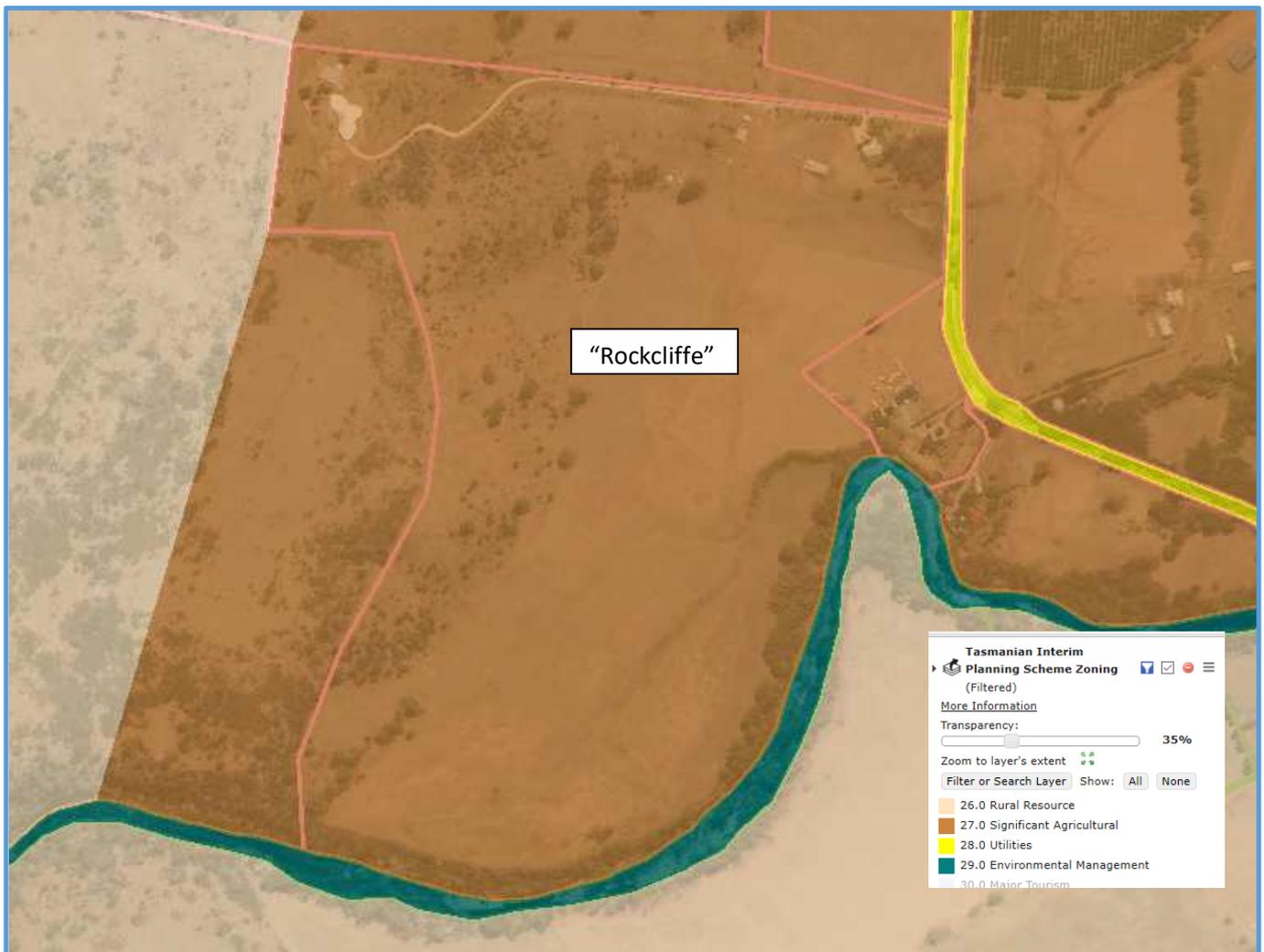


6.2 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘Boundary line with Accuracy’ filter.

The map displays the ‘Tasmanian Interim Planning Scheme Zoning

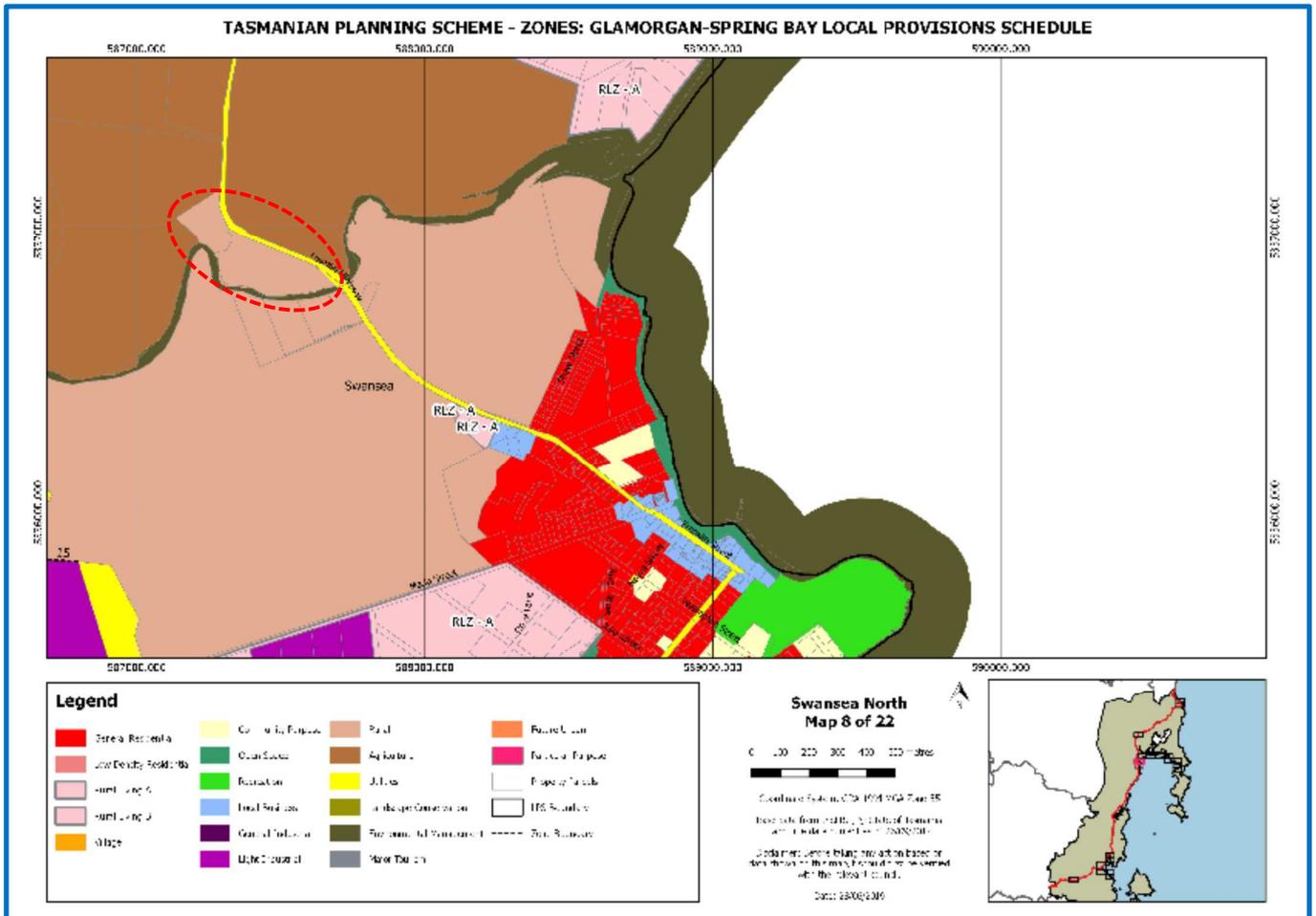
<https://maps.thelist.tas.gov.au/listmap/app/list/map>



6.2.1 Zone Maps 55K rural pdf. – Glamorgan Spring Bay Council

The map displays an adjusted 'Tasmanian Interim Planning Scheme Zoning' and identifies two properties that have changed from Agricultural Zone to the Rural Zone next to the 'Rockcliffe' property (i.e. *red dotted line*)

<http://gsbc.tas.gov.au/wp-content/uploads/2018/01/Zone-Maps-55K-rural.pdf>

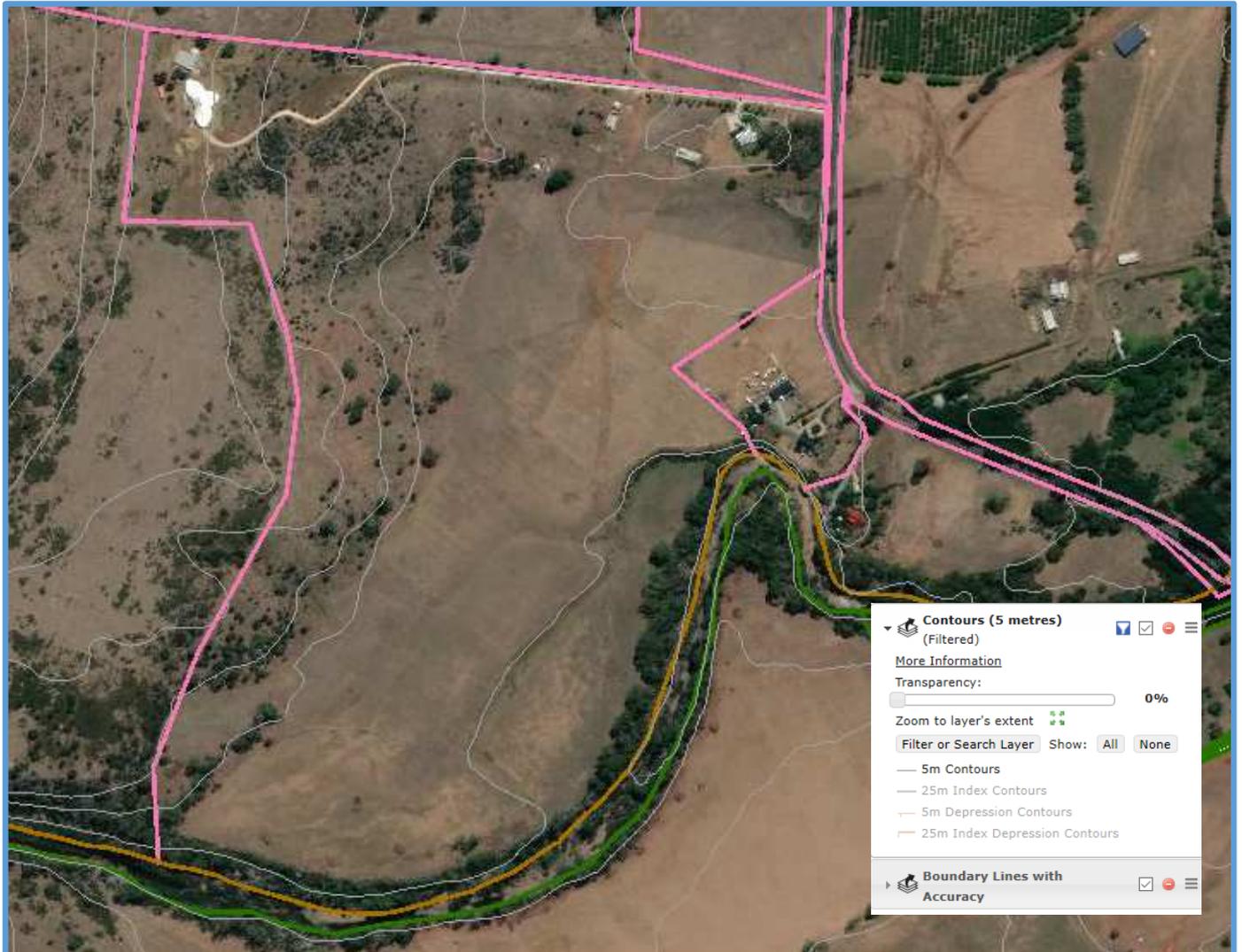


6.3 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘boundary line with accuracy’ filter.

The map displays the ‘5-metre contours’

<https://maps.thelist.tas.gov.au/listmap/app/list/map>



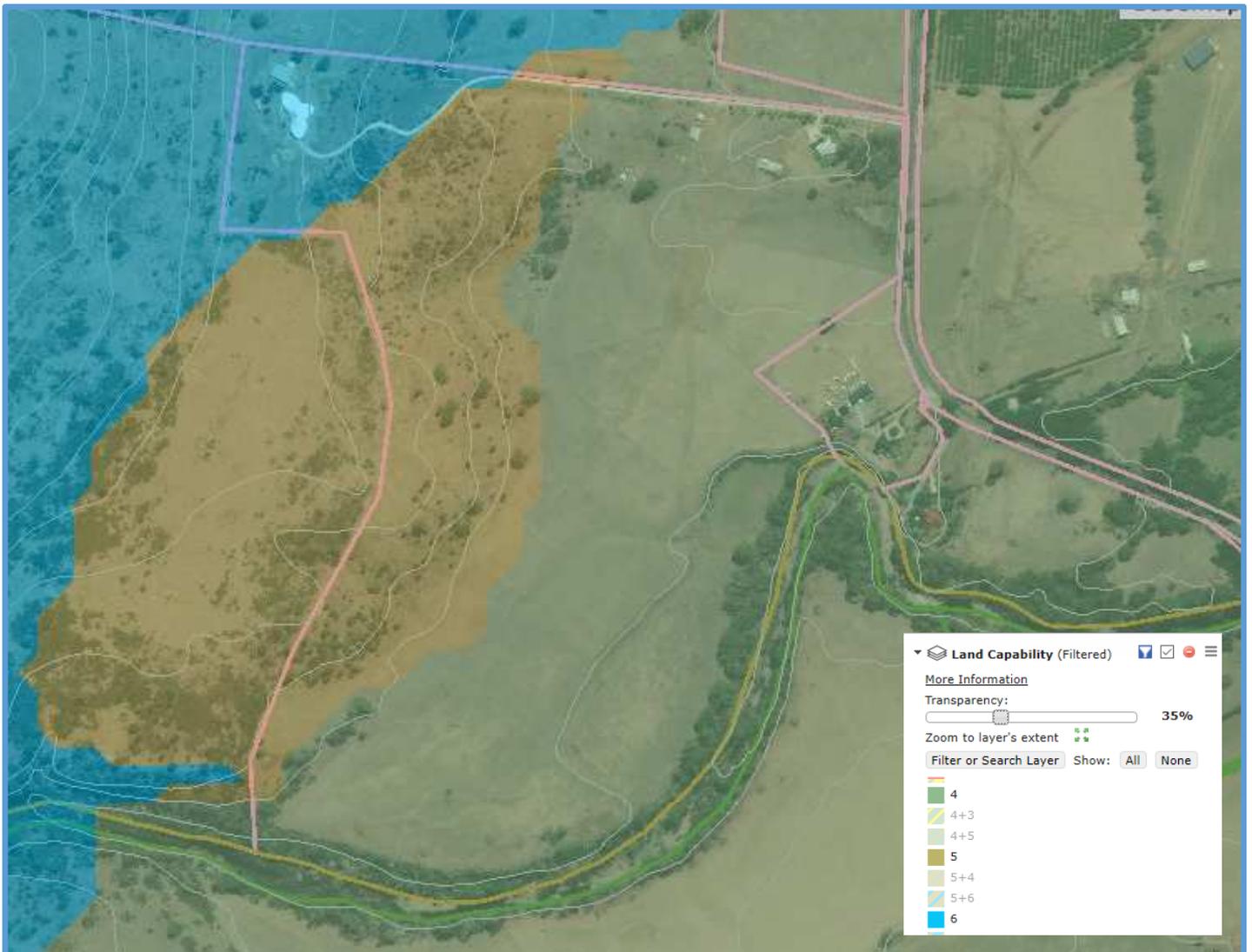
6.4 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘Boundary line with Accuracy’ filter.

The map displays the ‘5-metre contours’

The map displays the ‘Land Capability’ Filter’ identifying Class 6, Class 5 and Class 4 land.

<https://maps.thelist.tas.gov.au/listmap/app/list/map>



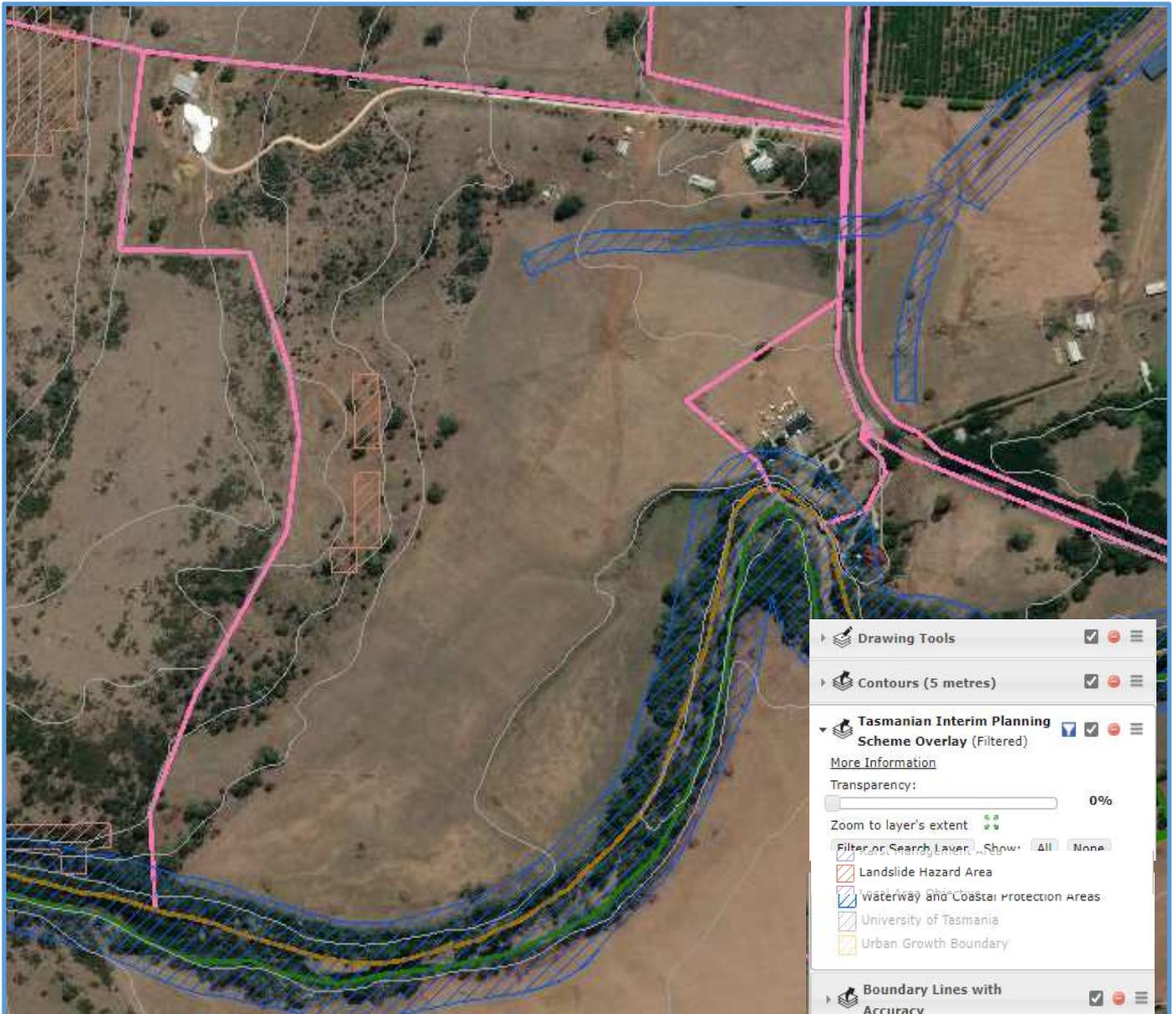
6.5 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘Boundary line with Accuracy’ filter.

The map displays the ‘5-metre contours’

The map displays the ‘Tasmanian Interim Planning Scheme’ filter identifying ‘Land slide Hazard Areas’ and ‘Waterway and Coastal Protection areas’

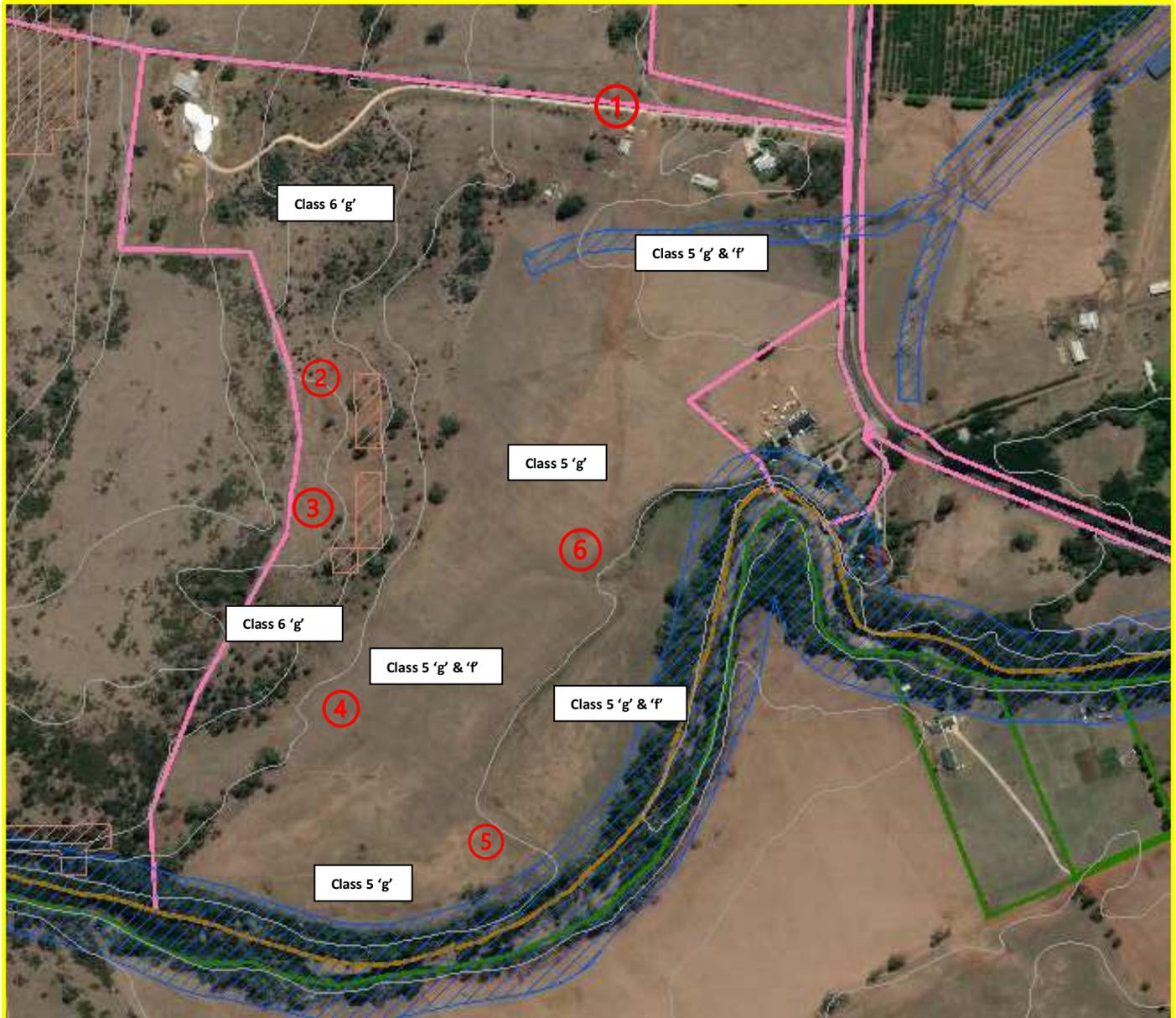
<https://maps.thelist.tas.gov.au/listmap/app/list/map>



6.5.1 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘Numbered Reference Points’ where Photo have been captured for cross referencing throughout the report.

This map displays ‘Land Capability’ classification for the “Rockcliffe” property



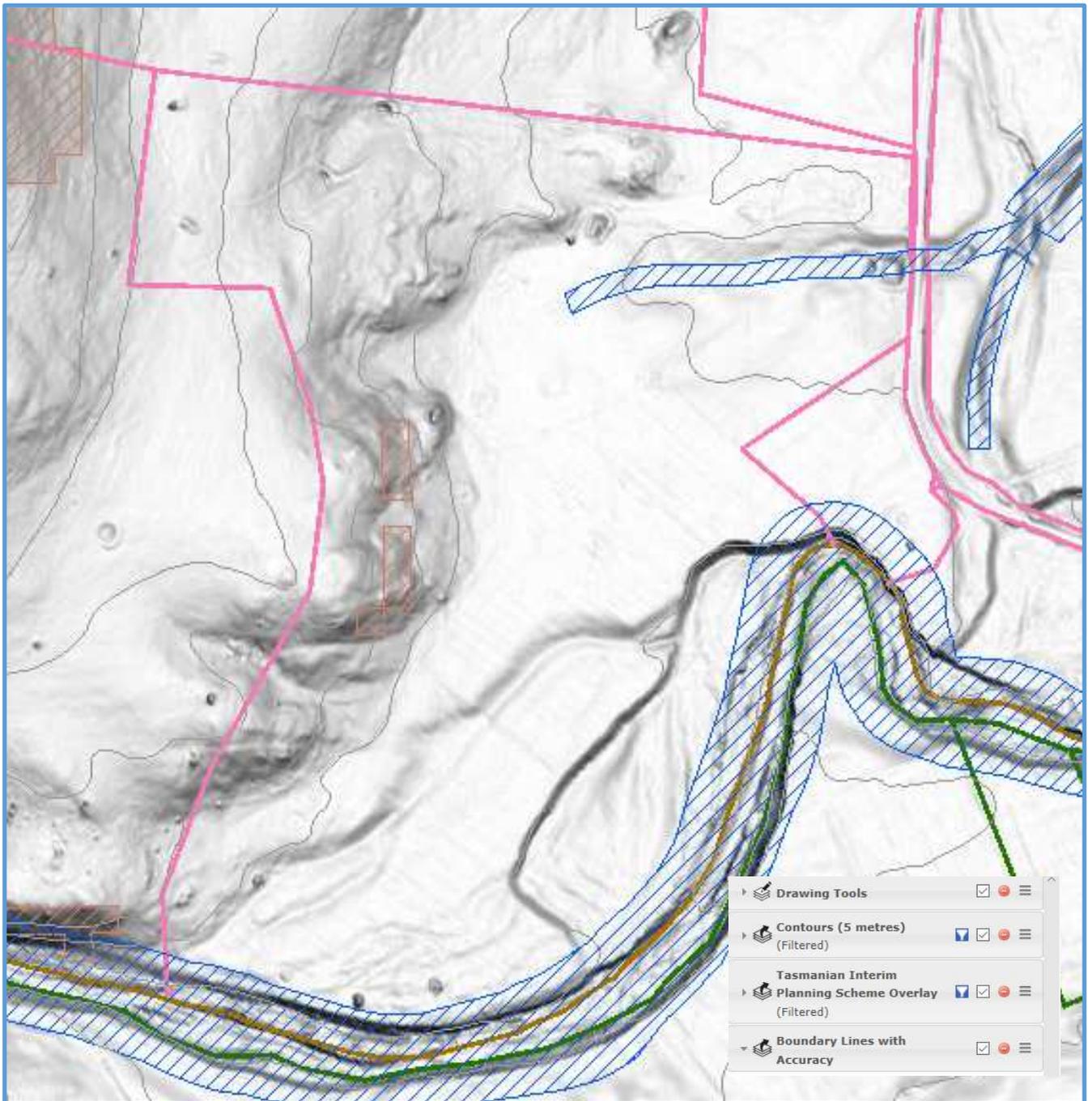
6.6 theList, Hillside Grey map identifying the “Rockcliffe” property.

The map displays the ‘Boundary line with Accuracy’ filter.

The map displays the ‘Tasmanian Interim Planning Scheme’ filter identifying ‘Land slide Hazard Areas’ and ‘Waterway and Coastal Protection areas’

The map displays the ‘5-metre contours’

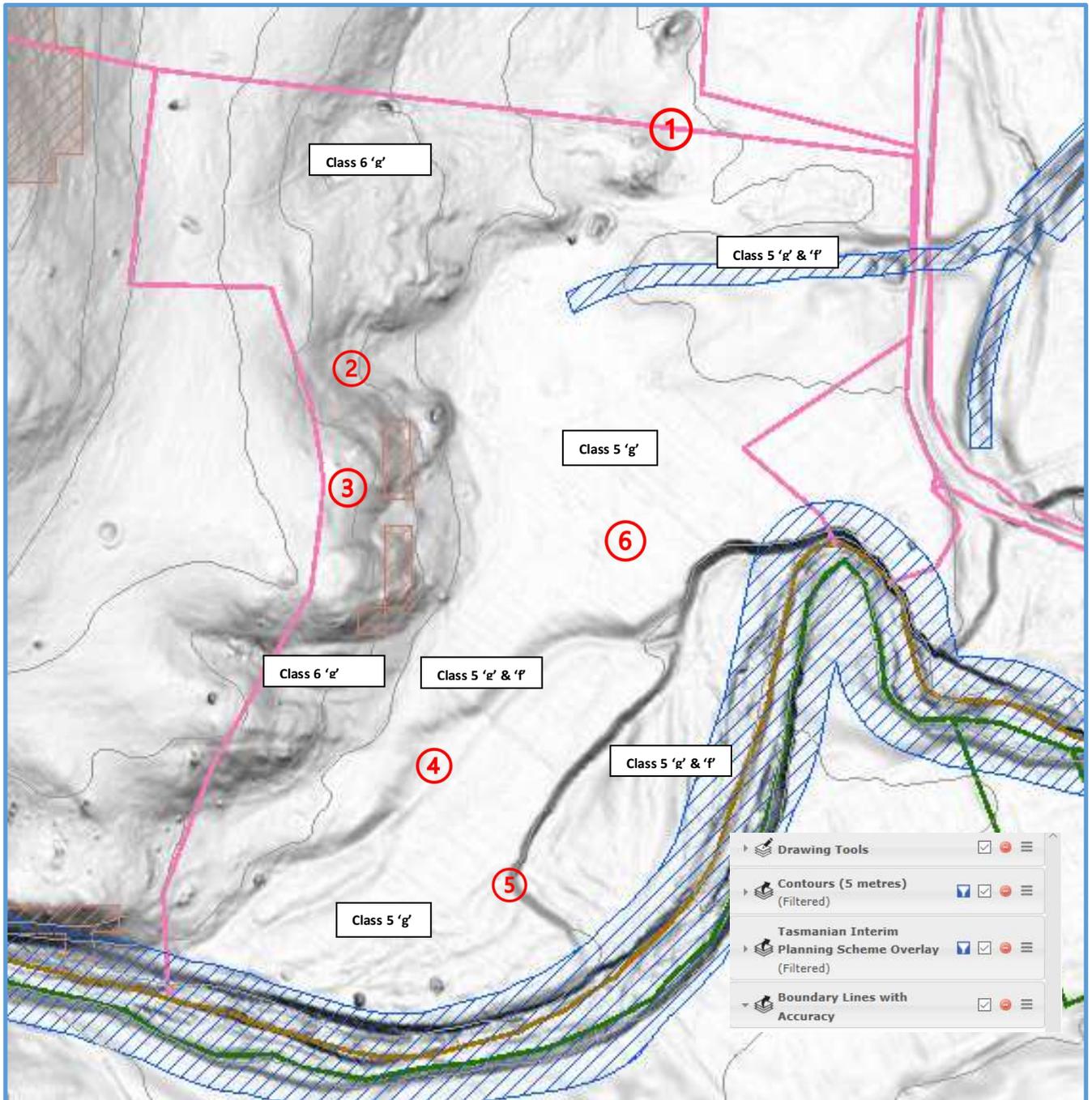
<https://maps.thelist.tas.gov.au/listmap/app/list/map>



6.6.1 theList, Hillside Grey map identifying the “Rockcliffe” property.

The map displays the ‘Numbered Reference Points’ where Photo have been captured for cross referencing throughout the report.

This map displays ‘Land Capability’ classification for the “Rockcliffe” property



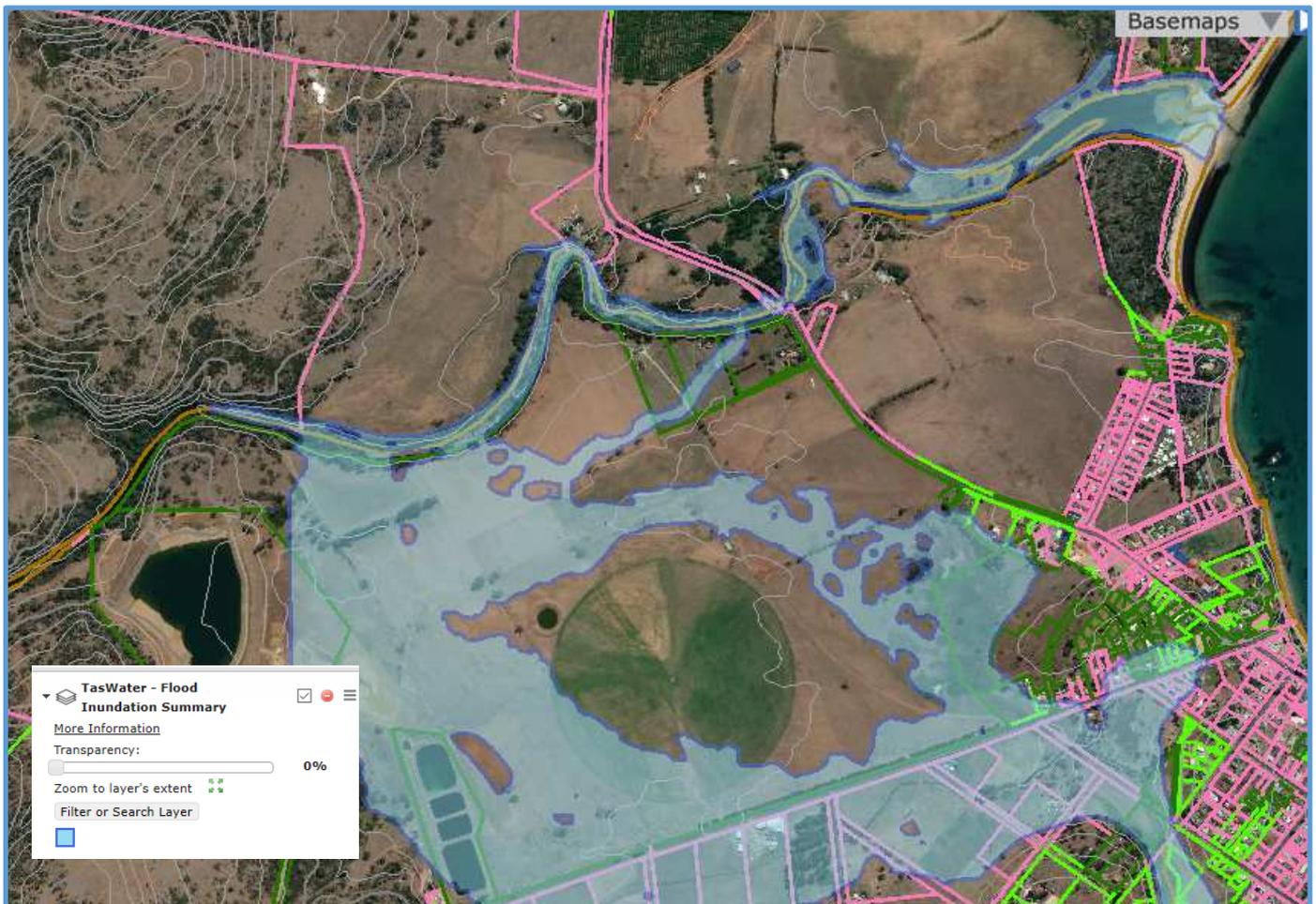
6.7 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘Boundary line with Accuracy’ filter.

The map displays the ‘5-metre contours’

This map displays the Tas Water – Flood Inundation Summary

<https://maps.thelist.tas.gov.au/listmap/app/list/map>



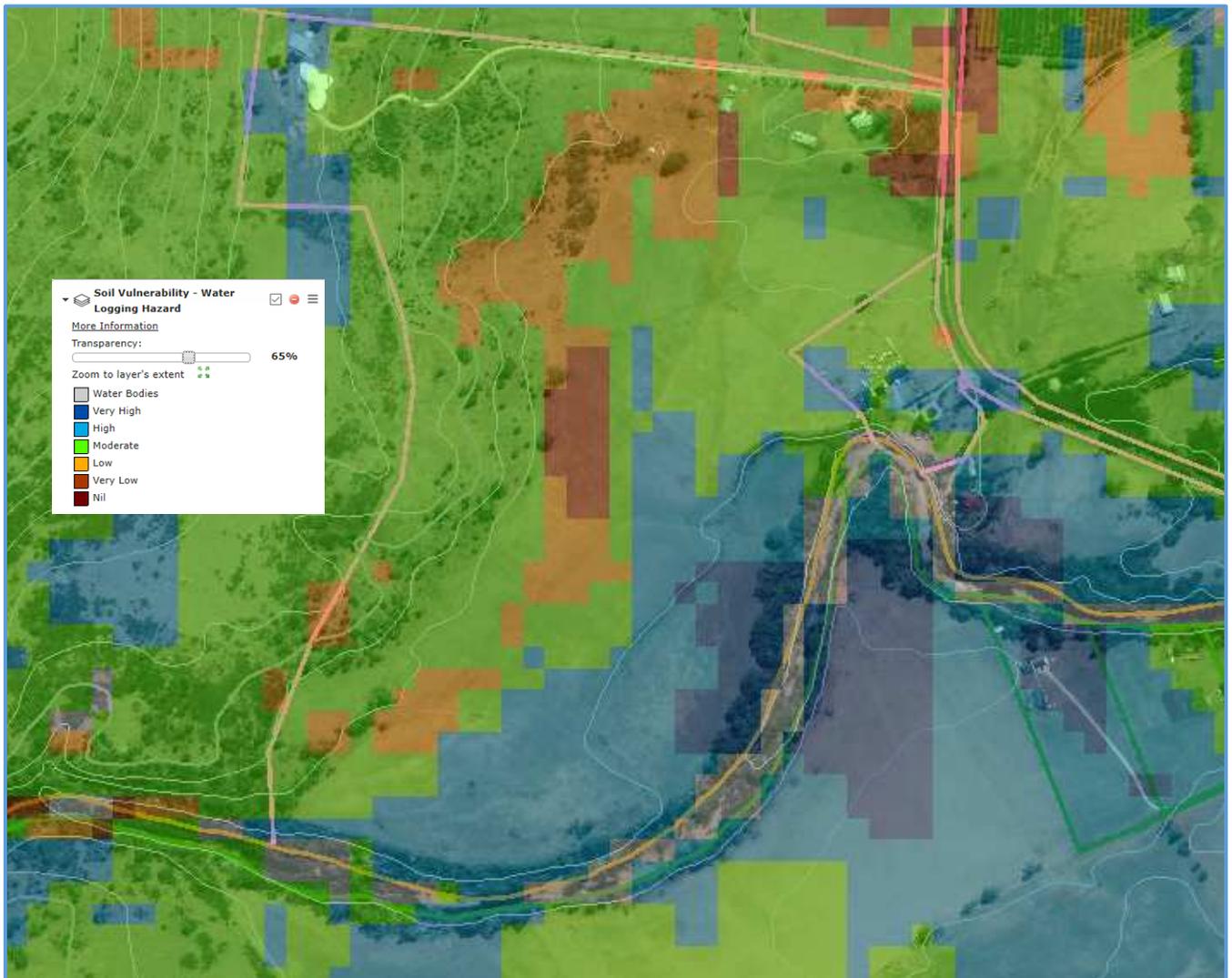
6.8 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘Boundary line with Accuracy’ filter.

The map displays the ‘5-metre contours’

The map displays the ‘Soil Vulnerability – Water Logging Hazard’

<https://maps.thelist.tas.gov.au/listmap/app/list/map>



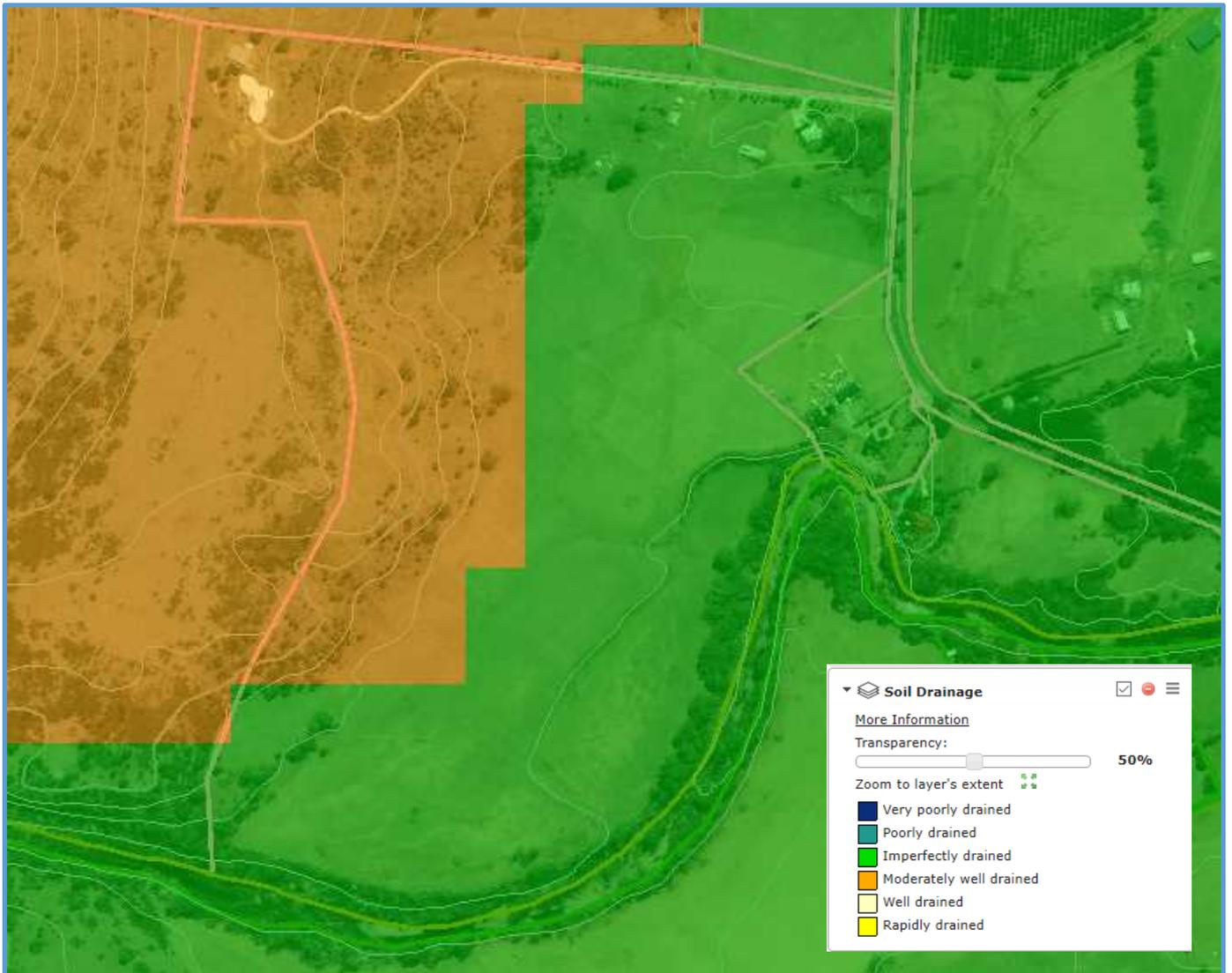
6.9 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘Boundary line with Accuracy’ filter.

The map displays the ‘5-metre contours’

The map displays the ‘Soil Drainage’

<https://maps.thelist.tas.gov.au/listmap/app/list/map>



7. References and Bibliography

DPIWE (2020). the List (*web site*). Land Information Systems Tasmania.

Department of Primary Industry and, Water and Environment, Tasmania, Australia.

<https://www.thelist.tas.gov.au/app/content/home>

Department of Justice. (2017). Agricultural Land Mapping Project. Identifying land suitable for inclusion within the Tasmania Planning Scheme Agricultural Zone. Background Report.

Department of Justice, Tasmania, Australia.

<https://planningreform.tas.gov.au/facts/state-planning-provisions>

Department of Justice. (2017). Tasmanian Planning Scheme – State Planning Provision.

Department of Justice, Tasmania, Australia.

http://www.justice.tas.gov.au/_data/assets/pdf_file/0007/370294/State_Planning_Provisions.PDF

Noble, K. E. (1992). Land Capability Handbook, Land capability Survey of Tasmania.

Department of Primary Industry, Tasmania, Australia.

Grose, G.J. (1999). Land Capability Handbook, Guidelines for the classification of Agricultural Land in Tasmania.

Department of Primary Industries, Water and Environment, Tasmania, Australia.

https://dpiuwe.tas.gov.au/Documents/Land_Cap_Revised-handbook.pdf

Lynch, S. (2002). Modelled Land Capability Classes of Tasmania, Freycinet 1:100,000 map.

Department of Primary Industry and, Water and Environment, Tasmania, Australia.

https://dpiuwe.tas.gov.au/Documents/Land_Cap_Freycinet_Map.pdf

Edo Tasmania (2016). Working near waterways. Understanding your legal obligation.

https://www.nrmsouth.org.au/wp-content/uploads/2016/09/EDO_Waterways_Guide_for_Web-2016.pdf

Chilvers, B. (1996). Managing Tasmania's Cropping Soils – a practical guide for farmers.
Department of Primary Industry and Fisheries, Tasmania, Australia.

<https://dpiwpe.tas.gov.au/Documents/Managing-Tasmanias-Cropping-Soils-2000.pdf>

Hamlet, A. (2002). Soil Management – A guide for Tasmanian Farmers
Department of Primary Industries, Water and Environment, Tasmania, Australia.

<https://dpiwpe.tas.gov.au/Documents/Soil-Guide.pdf>

Cotching, B. (2009). Soil Health for Farming in Tasmania.

Published by Bill Cotching, Tasmania, Australia

<https://eprints.utas.edu.au/9088/>

Corbett, K.D. (2015). Geology and geomorphology of Big Punchbowl- long Point, Moulting
Lagoon, Freycinet Peninsula.

Publisher unknown. Tasmania

<https://tasland.org.au/content/uploads/2016/09/K-Corbetts-Big-Punchbowl-Long-Point-Report-Apr-2015.pdf>

Agricultural Report

“Rockcliffe” Property

Bob & Annie Browning

Swansea

Tasmania

Literature & Resources Analysis

for a

Farm Management Plan

(viticulture – wine grapes)

August 2020

Rod Hancl, B.Ag.Sc. (Hon)

Agronomy Dynamics

PO Box 241, New Norfolk, 7140.

Table of Contents

	Page
1. Overview	3
2. Summary of Agricultural Report	4
3. Introduction	4
4. Literature & Resource Analysis (Viticulture)	5
4.1 Business Profile and Summary	6
4.2 Goals	8
4.3 Production Plan	9
Table 1. Factors to Consider in Vineyard Site Selection	11
Table 2. Factors to consider in Vineyard Establishment time frames	12
Table 3. Factors to consider in Vineyard Management	13
Table 4. Factors involved in Calculating Vineyard Water Use	14
4.4 Marketing Plan	15
4.5 Management and Labour Plan	15
4.6 Financial Plan	16
4.7 Benchmarking	17
5. Conclusion	18
6. Appendix,	
6.1 theList, ESRI Imagery map identifying the “Rockcliffe” property.	19
<i>'The map displays the ‘Tasmanian Interim Planning Scheme’ filter identifying ‘Land slide Hazard Areas’ and ‘Waterway and Coastal Protection areas’</i>	
6.2 theList, ESRI Imagery map identifying the “Rockcliffe” property.	20
<i>The map displays a potential Vineyard area – ‘red dotted line’</i>	
7. Reference, Bibliography & Industry Bodies	21

1. Overview

The following document forms part of an ‘Zone Application’ prerequisite for the “Rockcliffe” property, at Swansea, to amend the land assessment from a Significant Agriculture Zone (Agricultural Zone) to the Rural Resource Zone (Rural Zone) that are currently applied under the Glamorgan Spring Bay Interim Planning Scheme 2015.

A ‘Desktop’ study of the Tasmanian Government web site, ‘the List’ (DPIWE 2020) provides a good summary of the available land information and identifies that the 44.77 hectare “Rockcliffe” property (Appendix 6.1) would be suitable for wine grape production (i.e. viticulture). It also identifies that frost protection will be required during the growing season to protect the crop from damage. This land information system provides 1:100 000 map scale land capability classification and this resource data set has been amended for the Zoning Application process by a recent field-based land capability assessment, conducted in July 2020 (Hancl 2020).

This Land Capability assessment, of the “Rockcliffe” property, identified Class 5 land located centrally on the property, that may be suitable for wine grape production (i.e. located on the higher topography of the River Flats) (Appendix 6.2). The Class 5 land classification suggested that this river flat acreage is “only really suited to dryland grazing and low economic return, but such areas may have soils ideally suited to viticultural production with a high economic return” (Dep. of Justice 2017).

Notably land capability should not be confused with land suitability. In Tasmania land capability is a classification system that is used to rate the land for grazing and cropping relevance. Land suitability by comparison considers a more detailed collection of resource information.

The following report deals with the suitability to grow wine grapes on the River Flats of the “Rockcliffe” property (Appendix 6.2) with the remaining areas of the land probably best suited to grazing stock.

2. Summary of Agricultural Report

The following report is a 'Farm Management Plan' for the "Rockcliffe" property, at Swansea, on the East Coast of Tasmania. The land is located at the northern side of the township, bound in part, by the Tasman highway and the Meredith River (Appendix 6.1). This report will provide clarity to the Glamorgan Spring Bay Planning Scheme 2015 prerequisites for a planned zoning application for the property from Significant Agriculture Zone (Agricultural Zone) to Rural Resource Zone (Rural Zone).

The document presents the literature and resources that should be considered when formulating a 'Farm Management Plan' for wine grape production. The tools and information include electronic e-links to relevant 'Wine grape Literature', 'Industry Bodies' and relevant Government Departments. In general, the literature citations and e-links can be found in 'Section 7', References, Bibliography & Industry Bodies.

Kelowna (unknown) identifies that a farm specific business plan is best prepared by the individual farm owner(s) or manager(s). It is the game plan to set objectives and guidelines to benchmark outcomes and identify problems and action plans to keep the enterprise on track. This literature reference provides a guide for agricultural producers in preparing an actual more focused and specific Business Plan.

3. Introduction

To be successful in any commercial enterprise, a documented 'Farm Management Plan' would be of a fundamental importance for all new ventures whether they are wine grape production (viticulture), horticultural (e.g. olive, walnuts), agricultural (pasture, lucerne or cereals), or non-agricultural businesses.

Kelowna (unknown) identifies the key aspect of a 'Business Plan' should (in part) incorporate developing a document that considers the relevant Literature and Resources.

This literature review should then be the basis for developing a Business Profile and Summary that can be developed with corresponding Goals, Production Plans, Marketing Plans, Management and Labour Plans and a Financial Plans and a review system that Benchmarks the commercial outcomes. These key aspects will be discussed with reference to viticultural potential for the “Rockcliffe” property.

4. Literature and Resources Analysis (Viticulture)

The fundamental requirement for documenting a Farm Business Plan for any new enterprise requires a thorough understanding of that industry. This can be achieved by reviewing the available literature, resources information and industry-based networks at a local, state, and national level (Section 7).

This Report documents literature that should be considered for a good viticultural understanding and knowledge base. This literature includes information on the Tasmanian Viticultural soils, geology, and their management. The references include the ‘History of the Tasmanian Wine Industry’ (Walker 2012) and ‘the Production of Grapes & Wine in cool climates (Jackson & Schuster 2001) which provides an excellent understanding of the history and dynamics of viticulture in the Tasmanian environment. The ‘Grapevine Management Guide 2018-19’ (Fahey & Englefield 2018) provides a good understanding of pest and disease management in the vineyard. The ‘Organic grapes and wine, a guide to production (Parleviet & McCoy 2001) provides literature for a non-chemical or green approach to wine grape production. The Department of State Growth (2014) literature ‘The Wine Industry in Tasmania - A guide for investors’ provides thorough overview of the contemporary aspects of the developing Viticultural Industry of Tasmania. While more specific Tasmania literature that can be reviewed includes ‘Submission to Green Paper on Agricultural Competitiveness’ (Wine Tasmania 2014) or “Submission to the Legislative Council Committee Inquiry into growing Tasmania’s Economy” (Wine Tasmania 2015) (Section 7).

The Australian Viticultural industry associations can provide a practical knowledge base and a thorough overview of wine grape production. At a state level, for example, there is the Wine Tasmania and at a national level there is Wine Australia and The Australian Wine research Institute. These industry associations should be investigated and where appropriate joined to develop industry contacts and networks (Section 7).

4.1 Business Profile and Summary

The business profile and summary should provide an overview of why the “Rockcliffe” property is suited to a capital investment of resources for wine grape production. In particular, the Class 5 gravelly sandy-loam soil should be suitable viticulture production, the land has a 100 Meg water allocation from the Swan Valley Scheme for irrigation and frost protection outcomes and wine grapes are both grown to the north and south of the township of Swansea. But the land will only support a small boutique vineyard due to land constraints on the property. The zoning application adjustment to Rural Resource Zone (Rural Zone) from the present Significant Agricultural Zone (Agricultural Zone), for this land, would not affect the existing or future potential agricultural activity on this buffer zone type countryside.

The literature suggests that Tasmania is one of Australia’s strongest wine regions, with demand for its premium cool climate wines currently outstripping supply, widespread global recognition of Tasmania’s wine quality, and some of the highest prices in the country being achieved for Tasmania’s wines and wine grapes (Wine Tasmania 2014).

The grapevine, *Vitis vinifera*, has been cultivated for wine and enjoyed for over five thousand years (Jackson & Shuster 2001). In Tasmania Walker (2012) identifies that since the 1950’s, Tasmania has found good soil and climate regions for high quality wine production.

Climate is a major factor determining both where grapes can be grown, and the quality of the wine produced from them. Tasmania can be considered a cool-climate wine growing

region. Notably many of the best quality wines are produced in smaller ‘Boutique’ vineyards in cooler climates (Jackson & Schuster 2001).

Small boutique vineyard in cool climates, such as the acclaimed East Coast viticultural region of Tasmania, are being recognized for the major contribution that this type of land use makes towards the local economy. Examples of successful small boutique vineyards include, Darlington Vineyard at Orford (<https://www.darlingtonvineyard.com.au/>) and Kelvedon Estate Vineyard (<https://www.kelvedonestate.com.au/>), south of Swansea and too the north of the township, include Springvale Vineyard (<https://www.springvalewines.com/>) and Milton Vineyard (<https://www.miltonvineyard.com.au/>). These vineyards have produced table wines of distinction. For example, the Kelvedon 2012 Pinot noir won gold at both the Hobart Wine Show and Boutique Wine Awards. A “Rockcliffe” property vineyard development would fit the description of a Small boutique vineyard based on the limited maximum size for a vineyard development.

The Department of State Growth (2014) data suggest that in 2013 there was 200 vineyards, 1880 hectares under vine, 160 licensed wine producers and 29 wineries that enhanced state employment outcomes by 1100 full-time equivalent positions. This has grown to 230 vineyards by 2019 covering over 2000 plus hectare under vine cultivation (Wine Tasmania 2020) which equates to the average vineyard size being 8.7 ha. The average size Tasmanian vineyard would be much smaller if the large corporate vineyards were not included in these calculations (e.g. Brown Brothers Kayena Vineyard is 55 ha & The Hazards Vineyard is 175 ha).

A proposed viticultural venture on the “Rockcliffe” property has the potential to optimize the capability of the land, cultivate a valuable wine grape crop and provide maximum economic value to the owners and community. The economic benefits off grazing sheep for wool on this type agricultural land has not change for 25 years, in other words, a farmer has the same income now as he had two and a half decades ago from wool production.

Good management practice in small vineyards can lead to long term sustainable enterprises producing fine wines of distinction leading to enhanced regional wine accolades. This agricultural business direction can lead to optimal land capability outcomes for this property as it has done for approximately 230 vineyards in Tasmania.

4.2 Goals

The business goals for the “Rockcliffe” property would be to capitalize on the fact that the Tasmanian wine industry sector has been recognized by “both the Tasmanian and Australian Governments as having significant potential to continue and grow its contribution to the overall Tasmanian economy and reputation” (Wine Tasmania 2014).

These goals would be defined by the potential of the River Flat land of the “Rockcliffe” property being suitable for commercial establishment of wine grape production (Appendix 6.2). For example, a goal may be to establish 1 ha vineyard of Pinot noir or Chardonnay grapes. Ultimately this goal would vary for the enterprise based on the fundamental business profile, resources, and available finances for the capital investment required for the vineyard establishment.

Notably a major goal for a wine grape production should involve acquiring a thorough understanding of viticulture and wine making outcomes. The Wine Tasmania, Wine Australia and The Australian Wine Research Institute web sites provides excellent information for understanding the viticultural industry, wine making, and technical information on vineyard management and Pests and diseases. Kelowna (unknown) identifies other examples of potential business goals that should be considered for farm management outcomes.

Defining the business goals (e.g. a goal may be to establish 1 ha of vineyard) would shape the required approach and information for the planning of the enterprises production, marketing, finances, labour management and benchmarking outcomes. This

knowledge base could be fine tuned by joining the industry associations like Wine Tasmania.

4.3 Production Plan

The purpose of the ‘production plan’ is to evaluate how the “Rockcliffe” enterprise will efficiently manage wine grape production outcomes, produce efficient wine volumes and marketable products that the business may wish to sell.

The production plan for the “Rockcliffe” property would be defined by the logistic attributes of implementing the business goals of establishing productive wine grapes on the gravelly sandy-loam river flats (e.g. a goal may be to establish 1 ha of vineyard) (Appendix 6.2). This plan will define and shape the strategies required for the other parts of the Farm Management Plan for wine grape production.

The production plan for the “Rockcliffe” property should include many short and long term aspect required for good viticultural outcomes. These aspects should include the ‘Site Selection’ for the vineyard (Table 1) (i.e. with consideration of the ‘Protected Waterway Area’ and run-off water impact on the river flats), the subsequent ‘Vineyard Establishment’ time frames (Table 2), and the in situ ‘Vineyard Management’ (Table 3).

“Water management for grapevine production is one of the major factors which vineyard managers have to influence the type of fruit that is produced” (Grieger 1998). Calculating potential vineyard water usage for irrigation (Table 4) and frost protection outcomes will be important on these sedimentary sandy-loam soils to help reduce run-off and potential erosion hazards. Notably an understanding of the soil and how it changes across the vineyard is critical in the design and management of irrigation system as it would be for utilizing water for frost protection in the vineyard.

The “Rockcliffe” property is not limited by availability of water as it is located within the Swan Valley Irrigation Scheme and has a 100 Meg allocation from the scheme but the

potential for soil erosion or nutrient leaching from excess irrigation or frost protection should be carefully considered when establishing the wine grape production on the river flats area (Appendix 6.2). Hamlet (2002) provides guidelines for intercepting run-on water and to manage run-off water to reduce soil erosion outcomes for farming systems.

Kelowna (unknown) identifies other examples of production planning strategies that should be considered for agricultural enterprise planning outcomes. Defining the production plan would shape the approach and required information for the planning of the business marketing, financial, labour and benchmarking outcomes. This knowledge base could be fine-tuned by joining the industry associations like Wine Tasmania.

Table 1. Factors to Consider in Vineyard Site Selection

The “Rockcliffe” property Class5 land suitable for a vineyard (Appendix 6.2)

The following should be considered in wine grape production on the land.

Professional Advice	Viticultural Consultant / Agronomist
	Vineyard design consultant
	Vineyard building consultant
	Wine maker / Industry contact
	Waterway Protection Areas Consultant
	Dam building consultant (permit)
	Frost Protection Consultant
	Irrigation Consultant
Define the land suitability	Define & survey vineyard area (size)
	Define flooding potential of waterway i.e topography (slope / drainage / water logging)
	Wind break design / suitability / planting?
Define micro climatic suitability	Rainfall (extreme events) / evapotranspiration / BOM data for Swansea / Friendly Beaches?
	Consider farm data (software) collection from potential vineyard site?
	Frost potential / months / impact on vines / water volumes for frost protection / dam size
	Direct sunlight hours (aspect versus ripening)
Define soil type suitability	Soil analysis & interpretation (topsoil & subsoil) & incorporation implementation of amendments (i.e. lime / gypsum / fertiliser). Cultivation or ripping (or both).
	Define the erosion potential of vineyard area from cultivation, ripping, irrigation & frost outcomes
	Define impact of gravelly soil on farm equipment?
	Define soil ripping of vine rows & incorporation of amendments & fertiliser
	Define cover crop area outcomes (i.e. sow with grass / soil incorporate / direct drill seed & fertiliser etc)
Water Availability / Vineyard Size	Dam site(s) versus required water from scheme for irrigation and frost protection. Impact on waterway protection area (permit?)
Research Viticultural Markets	Best cool-climate cultivars for soil type etc ?
	Most popular cool-climate wine variety etc?
	Contract wine maker (costs?)
	Contract supply of wine grape (returns?)

Table 2. Factors to consider in ‘time frames’ for a Vineyard Establishment

The “Rockcliffe” property Class5 land suitable for a vineyard (Appendix 6.2)

The following should be considered in wine grape establishment on the land.

24 months prior to planting	Vineyard Consultants / Agronomists
	Vineyard sites selection & design
	Water supply (dam site)
	Irrigation & Frost Protection water volumes
	Dam site for scheme water (dam permit)
	Land preparation (trees / stone / cultivation)
	Soil sampling analysis (topsoil / subsoil)
18 months prior to planting	Order planting stock (number of canes) / vineyard trellis requirements
	Consider cultivation of soil / weed control
	Consider soil lime & / or Gypsum and fertiliser augmentation (i.e. cultivate or rip?)
12 months prior to planting	Consider labor force & training (FTE)
	Check planting stock order
	Implement topsoil amendments (i.e. lime / gypsum / fertiliser) (i.e. cultivate?).
	Implement cover cropping / permeant pasture species or turf grasses / weed control
6 – 4 months prior to planting	Mark out vineyard design / deep rip rows / apply sub soil fertiliser & amendments
	Maintain vineyard cover crop / pasture / turf & weed control
3 months prior to planting	Vineyard trellis establish (i.e. poles & wires)
	Vineyard irrigation and frost protection establishment
	Vermin protection / fencing establishment
	Weed control
Planting outcomes	Cane (vine) planting / establishment
	Vine irrigation management program / documentation recording / mulching
	Vine pest management program / documentation recording
	Vine nutrition management / documentation recording / soil & plant tissue analysis

Table 3. Factors to consider with in situ Vineyard Management

The “Rockcliffe” property Class5 land suitable for a vineyard (Appendix 6.2)

The following should be considered in wine grape annual management program.

Vineyard Site Management	Soil erosion stabilization i.e. pasture establishment / cover cropping versus tractor movements
	Water run-off issues i.e. drainage / water logging versus irrigation (fertigation) & frost protection outcomes
	Wind breaks i.e. design & management
	Wildlife issues i.e. fencing design / bird netting management
Irrigation & frost protection	Water volume required / vineyard size / dam size & its delivery to vineyard area
Planting layout / design	Row size / vine spacing i.e. all vines being irrigated or frost protected adequately. Are tractor movements efficiently applying pesticide & nutrition program
Cool climate cultivar selection	Has the best grape cultivar been selected i.e. Pinot Noir / Pinot Gris / Chardonnay for the vineyard??
	Cultivar yield versus quality versus potential yield returns in the marketplace
Crop Nutrition requirements	Soil lime & / or Gypsum requirements
	Annual Phosphorus, Potassium & Sulphur and trace element requirements
	Application methods for applied nutrition program i.e. broadcast / banded / fertigation / foliar?
Integrated Pest Management	Organic or inorganic? i.e. research option / application method / equipment required / OH&S requirements
	Best pest control management options i.e. Weeds / Fungicide / Insecticide / Recording Data of chemical application

Table 4: Factors involved in Calculating Vineyard Water Use (VWU)

$\text{VWU (Litres) / Vine / day} = \text{Crop Factor} \times \text{Evaporation (mm)} \\ \times \text{vine spacing} \times \text{row spacing}$		
Crop Factor for spur pruned vine on a single wire with mown under vine sward		
	Young	Mature
Budburst	0.05	0.10
Flowering	0.10	0.25
Verasion	0.20	0.50
Harvest	0.30	0.50
Postharvest	0.20	0.25
<p>Reference: Primary Industries and Resources (1999). Water Management for Grape Production: Research to Practice. Primary Industries and Resources, South Australia</p>		
<p>Example Calculation:</p> <p>A mature vine at Verasion would use 13.5 Litres per day if the vine spacing was 1.5 m and row spacing was 3m and evaporation was 6mm</p> $\begin{aligned} \text{VWU (Litres) / Vine / day} &= \text{Crop Factor} \times \text{Evaporation (mm)} \\ &\quad \times \text{vine spacing} \times \text{row spacing} \\ &= 0.5 \times 6.0\text{mm} \times 1.5 \text{ m} \times 3.0\text{m} \\ &= 13.5 \text{ L / Vine / Day} \end{aligned}$		

4.4 Marketing Plan

The purpose of the marketing plan for a “Rockcliffe” property vineyard is to evaluate the wine grape industry and therefore highlight potential customers and competitors, define opportunities, trends, and constraints.

The marketing plan would be defined by the wine grape plantings and yield outcomes. That would be based on the business goals and production plan outcomes which are all defined by capital investment constraints. For example, at a basic planning level, the process should consider the cultivar of the grapes being planted. The opportunity for the grapes from this cultivar to be either sold without value adding (e.g. directly to a buyer or winery) or value added into wine, bottled and then sold through a wine marketer or with a further capital investment via a cellar door or winery located on the property.

Defining the marketing plan would shape the required approach and required information for the planning of the financial plan, labour management and benchmarking outcomes. This knowledge base could be fine-tuned by joining the industry associations like Wine Tasmania.

4.5 Management and Labour Plan

The purpose of the management and labour plan, for the “Rockcliffe” property vineyard, is to evaluate how the goals, production plan and marketing plan outcomes will be implemented and what labour inputs will be required to achieve these objectives.

The management and labour plan for the proposed vineyard would be characterized by the business knowledge base and understanding of all aspects of the wine grape production. The cited literature provides an excellent reference material for comprehending the Australian and Tasmanian viticultural industries. This will help correlate the labour roles and their individual training requirement in the wine grape enterprise.

The labour inputs for a viticultural enterprise may require either employing qualified employees or may involve obtaining viticultural training (e.g. working in vineyard to obtain required skills) or recognized training courses, for example, Tasmania Tafe course (<https://www.tastafe.tas.edu.au/courses/course/fbp20518>) or University course in viticulture or Oenology (i.e. wine making).

The management and labour plan should include an understanding of government employment guidelines. And depending on the planned business outcomes for the viticultural business may include the requirement for a liquor license (<https://www.treasury.tas.gov.au/liquor-and-gaming/liquor/applying-to-sell-liquor/apply-for-a-liquor-licence>) or a certificate in the responsible serving of alcohol (<https://www.treasury.tas.gov.au/liquor-and-gaming/liquor/responsible-service-of-alcohol>)

Kelowna (unknown) identifies other examples of potential management and labour strategies that should be considered for agricultural outcomes. This knowledge base could be fine-tuned by joining the industry associations like Wine Tasmania.

4.6 Financial Plan

The purpose of the financial plan is to evaluate the costs, assumptions and income that can be derived from the planned viticultural enterprise on the “Rockcliffe” property.

Wine Tasmania (2020) identifies that in the 2019 vintage there was 17,180 tons harvested (i.e. approximately 1.24 M cases of wine). This equates to an average approximate outcome of 8.6 tons per hectare of wine grape production in Tasmania.

Wine Tasmania (2020) identifies the average value of Tasmania wine grapes in 2019 was \$2827 / ton. In particular, the value for still table wines grapes was \$3133 / ton and sparkling wine grapes was \$2640 per ton.

Utilising the Wine Tasmania data it can be extrapolated that a 1-hectare block of wine grapes with an average yield of 8.6 tons could provide a gross average return back to a viticulture venture of between \$22, 704 / ha (i.e. sparkling wines grapes) to \$26, 943 / ha (i.e. still wine grapes).

The financial plan for the proposed wine grape production would be ultimately defined by the potential size of a vineyard that can be planned, this will guide the size of a dam that is required and the subsequent business goal, production plan, marketing plan and labour management outcomes.

Kelowna (unknown) identifies examples of financial strategies and analysis tools that should be considered for agricultural enterprise outcomes. This knowledge base could be fine-tuned by joining the industry associations like Wine Tasmania.

4.7 Benchmarking

The purpose of the business benchmarking is to evaluate the planned strategies for the “Rockcliffe” property vineyard against the actual seasonal outcomes in wine grape production, yield, and quality.

Kelowna (unknown) provides examples of benchmarking strategies that should be considered for agricultural enterprises and states that “regular review of your plan, comparing it to results shown in actual records, will allow you to identify problems and make adjustments quickly”.

Good benchmarking practices for any viticultural enterprise will reduce the risk of spread of viticultural disease (e.g. eutypa, botrytis or Powdery Mildew), noxious weeds, limit fire risk and have good land management outcomes thus protecting the economic value of the rural lands. Wine production from “Rockcliffe” Vineyard could be benchmarked via entering State wine shows (e.g. Hobart Wine Show or other regional events) or Australian wine awards.

This viticultural knowledge base could be fine-tuned by joining the industry associations like Wine Tasmania.

5. Conclusion

The East Coast of Tasmania can be classified as a cool climate viticultural region and hence by definition vineyards have the potential of producing quality grapes and wines of distinction. Tasmania's global reputation for outstanding wines is reflected in the value of both our grapes (five times the country's average) and wine (more than double the country's average), as well as increasing visitations to the island's cellar door (close to 300,000 interstate/ international visitors to the twelve months to December 2018)" (Wine Tasmania 2020).

In theory this 'Farm Management Plan' should provide the "Rockcliffe" property the means to safeguard the agricultural productivity of the Class 5 land. The report presents the fundamental concepts involved with planning a wine grape venture. This vision should incorporate a basic understanding of the Tasmanian wine grape industry, vineyard soils, site selection, vineyard establishment, and ongoing management to achieve good yield high quality grapes that produce wines of distinction.

The Department of State Growth (2014) has developed the following literature, 'The wine industry in Tasmania, A guide for investors. In particular this document clearly defines the key reason for investing in the Tasmanian wine industry (www.investtasmania.com.au).

This proposed agricultural outcome for the land will basically have the potential to transform pastureland utilized to graze sheep into a viticultural venture. This vineyard development under good management has the potential to produce world classed wines. But for the proposed wine grape venture to be a successful agricultural development it will ultimately require a need to incorporate careful planning and high capital inputs.

Appendix 6.

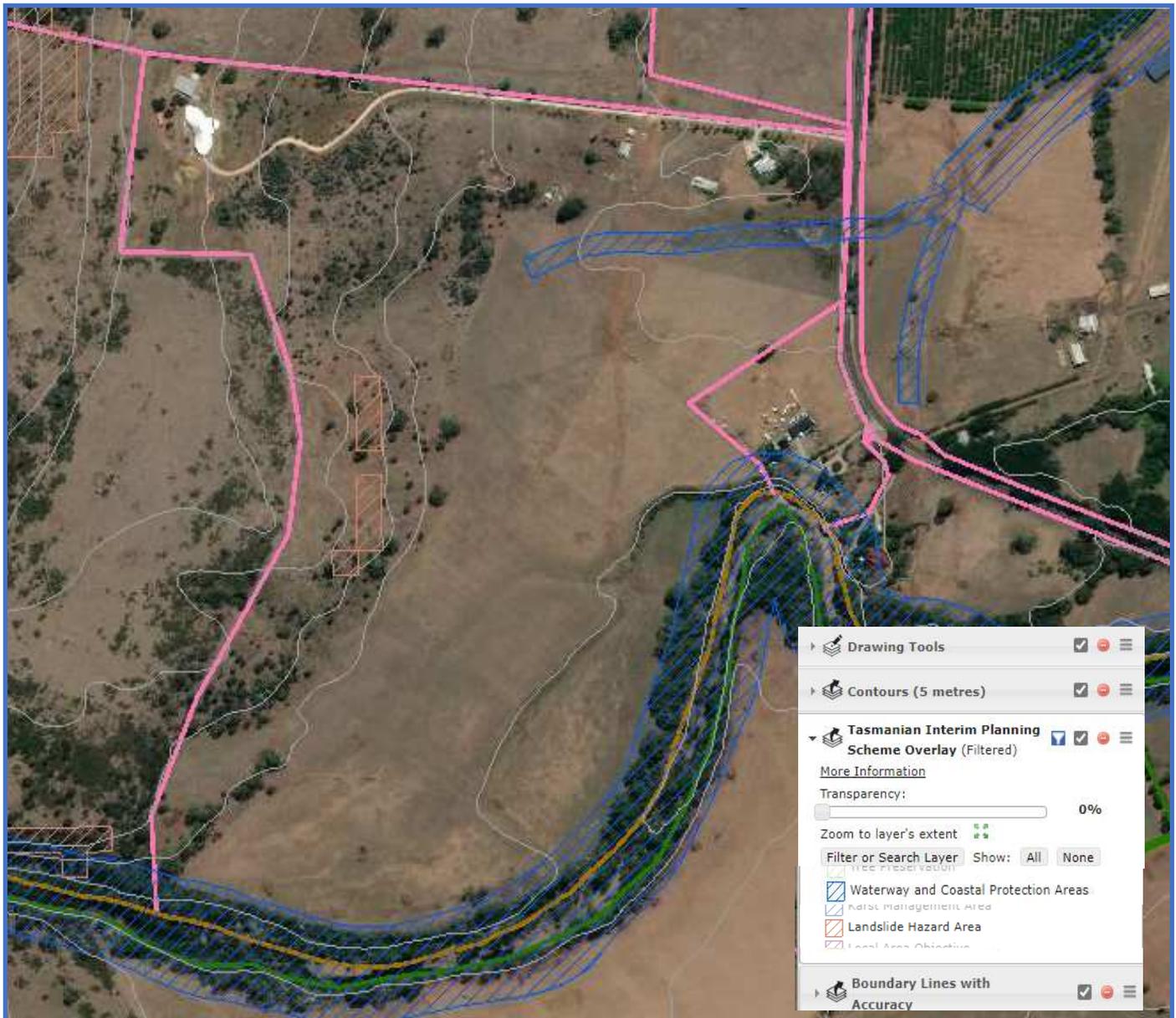
6.1 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays the ‘Boundary line with Accuracy’ filter.

The map displays the ‘5-metre contours’

The map displays the ‘Tasmanian Interim Planning Scheme’ filter identifying ‘Land slide Hazard Areas’ and ‘Waterway and Coastal Protection areas’

<https://maps.thelist.tas.gov.au/listmap/app/list/map>



6.2 theList, ESRI Imagery map identifying the “Rockcliffe” property.

The map displays a potential Vineyard area – ‘red dotted line’

The map displays the ‘Swan District Irrigation Scheme’ pipeline (blue dotted line) going through the property.

<https://maps.thelist.tas.gov.au/listmap/app/list/map>



7. Reference, Bibliography & Industry Bodies

- DPIWE (2020). the List (*web site*). Land Information Systems Tasmania.
Department of Primary Industry and, Water and Environment, Tasmania, Australia.
<https://www.thelist.tas.gov.au/app/content/home>
- Department of Justice. (2017). Agricultural Land Mapping Project. Identifying land suitable for inclusion within the Tasmania Planning Scheme Agricultural Zone. Background Report.
Department of Justice, Tasmania, Australia.
https://planningreform.tas.gov.au/_data/assets/pdf_file/0004/390874/Agricultural_Land_Mapping_Project_-_Background_Report_-_May_2017.pdf
- Grose, G.J. (1999). Land Capability Handbook, Guidelines for the classification of Agricultural Land in Tasmania.
Department of Primary Industries, Water and Environment, Tasmania, Australia.
https://dpiipwe.tas.gov.au/Documents/Land_Cap_Revised-handbook.pdf
- Hancl, Rod (2020). “Rockcliffe” Property. Land Capability Assessment. (unpublished). Agronomy Dynamics, New Norfolk, Tasmania.
- DIPIWE (Unknown). Tasmania Viticultural Soils and Geology Map.
<https://dpiipwe.tas.gov.au/Documents/Geology3.pdf>
- Chilvers, B. (1996). Managing Tasmania’s Cropping Soils – a practical guide for farmers. Department of Primary Industry and Fisheries, Tasmania, Australia.
<https://dpiipwe.tas.gov.au/Documents/Managing-Tasmanias-Cropping-Soils-2000.pdf>
- Hamlet, A. (2002). Soil Management – A guide for Tasmanian Farmers
Department of Primary Industries, Water and Environment, Tasmania, Australia.
<https://dpiipwe.tas.gov.au/Documents/Soil-Guide.pdf>
- Cotching, B. (2009). Soil Health for Farming in Tasmania.
Published by Bill Cotching, Tasmania, Australia
<https://eprints.utas.edu.au/9088/>
- Kelowna, B.C. (unknown). Preparing a business plan. A guide for Agricultural Producers. Bee Keeper example.
Ministry of Agriculture, Fisheries and Food, British Columbia. Prepared by J.A. Lloyd Management Services.
<http://beekeeperstraining.com/file2/source/books/61.pdf>

- Walker, A. (2012). A History of the Tasmanian Wine Industry.
Submitted for Degree of Masters of Arts, University of Tasmania.
<https://eprints.utas.edu.au/14809/2/whole-walker-thesis-2012.pdf>
- Jackson, D & Schuster, D. (2001). The Production of Grapes & Wine in cool climates.
Daphne Brasell Associates and Gypsum Press, New Zealand.
<https://sites.google.com/a/furtil.host/ellarhludowig/the-production-of-grapes-and-wine-in-cool-climates-butterworths-agricultural-books>
- Department of State Growth (2014). The wine industry in Tasmania. A guide for investors.
Department of State growth, Invest Tasmania, Hobart, Tasmania, Australia.
https://www.cg.tas.gov.au/_data/assets/pdf_file/0012/123402/Tasmania_Delivers_-_Wine.pdf
- Grieger, G. (2000). Grapevine Nutrition: Research to Practice. Workshop Training Manual.
Department of Primary Industry and Resources, South Australia.
- Parlevliet, G, and McCoy, S. (2001), Organic grapes and wine. a guide to production.
Department of Agriculture and Food, Western Australia, Perth. Bulletin 4516.
<https://researchlibrary.agric.wa.gov.au/bulletins/142/>
- Proffit, T & Campbell-Clause, J. (unknown). Water Management for Wine Grapes in a dry environment.
Grape and Wine Research and Development Corporation, Western Australia.
<http://www.foodfuture.com.au/wp-content/uploads/2017/01/Water-management-for-wine-grapes-in-a-drying-environment-LR.pdf>
- TIA (Unknown). Projected impact of climate change on wine grape production opportunities for grower
<https://dpiw.tas.gov.au/Documents/Wine-Production-V8---31-May-FINAL.pdf>
- Wine Tasmania (2015). Submission to the Legislative Council Select Committee Inquiry into growing Tasmania's Economy. Hobart, Tasmania
<https://www.parliament.tas.gov.au/ctee/council/Submissions/GTE/Wines%20Tasmania.pdf>
- Wine Tasmania (2014). Submission to Green Paper on Agricultural Competitiveness.
Hobart, Tasmania
http://winetasmania.com.au/resources/downloads/Wine_Tasmania_-_submission_to_Green_Paper_on_Agricultural_Competitiveness_Dec14.pdf

Plant Health Australia (2009) Industry Biosecurity Plan for the Viticulture Industry (Version 2.0). Plant Health Australia. Canberra, ACT
<https://www.agw.org.au/assets/environment-biosecurity/Biosecurity-Plan.pdf>

Edo Tasmania (2016). Working near waterways. Understanding your legal obligation.
https://www.nrmsouth.org.au/wp-content/uploads/2016/09/EDO_Waterways_Guide_for_Web-2016.pdf

Fahey, D. & Englefield, A. (2018). Grapevine Management Guide 2018-19.
Department of Primary Industries, NSW, Australia
www.dpi.nsw.gov.au
<https://www.dpi.nsw.gov.au/agriculture/horticulture/grapes/grapevine-management-guides-current-and-past-editions/grape-management-guide-2018-19>

Industry Bodies

Tasmanian Institute of Agriculture
<https://www.utas.edu.au/tia/horticulture/fermentation/resources>

Wine Tasmania
<http://winetasmania.com.au>

Wine Titles (2020). 2019 Tasmanian winegrape vintage results.
<https://winetitles.com.au/2019-tasmanian-winegrape-vintage-results/>

Wine Australia
<https://www.wineaustralia.com/>

The Australian Wine Research Institute
<https://www.awri.com.au/>

The Australian Wine Research Institute
Agrochemicals registered for use in Australian Viticulture 20 / 21
https://www.awri.com.au/wp-content/uploads/agrochemical_booklet.pdf