



Attachments to item number 5.1 -

*Letter Response to Request for Further
Information;*

Geotechnical Assessment;

Bushfire Assessment Report; and

Dispersive Soils Report

Phil Gartrell phil@irenamr
RE: recent ph conversation
25 March 2024 at 5:03 pm
Mitchell Rowlands

SORELL COUNCIL

27 MAR 2024

RECIEVED

Hi Mitchell,

I spoke with Shane.

He is after a more detailed response to the Subdivision Standards for the Agriculture Zone and Low-Density Residential Zone.

I've provided some further comments below to assist – let me know if anything below is incorrect.

Agriculture Zone - Clause 20.5.1 - P1(a)

P1 - Each lot, or a lot proposed in a plan of subdivision, must:

- (a) provide for the operation of an agricultural use, having regard to:
 - (i) not materially diminishing the agricultural productivity of the land;
 - (ii) the capacity of the new lots for productive agricultural use;
 - (iii) any topographical constraints to agricultural use; and
 - (iv) current irrigation practices and the potential for irrigation;

P1 (a) (i) & (ii) The subdivision seeks to separate the Low-Density Residential portion of the site from the Agriculture zoned portion. The agriculture section will become the balance and comprises the majority of the site area (approximately 15.9ha). This area is utilised by the landowner for an existing agricultural use, which will continue.

The existing Low-Density Residential portion of the site already diminishes/constrains the agricultural productivity of the site, as agricultural use/development is prohibited in the LDR zone. The proposed subdivision will separate the agricultural portion which will become the balance lot, ensuring the ongoing operation of the agricultural use without constraint. No new agricultural lots are proposed.

The proposal complies with P1(a)(i) and (ii).

P1 (iii) & (iv) The site, proposed subdivision and existing agricultural use is not subject to any topographical constraints.

The balance agricultural portion of the site adjoins land to the north which forms part of an irrigation district. However, the proposed subdivision is not anticipated to have any impact on any existing or future connections to the irrigation scheme.

The proposal complies with Clause 20.5.1.

Low-Density Residential Zone - Clause 10.6.1

P1 - Each lot, or a lot proposed in a plan of subdivision, must have sufficient useable area and dimensions suitable for its intended use, having regard to:

- (a) the relevant requirements for development of buildings on the lots;
- (b) the intended location of buildings on the lots;
- (c) the topography of the site;
- (d) adequate provision of private open space;
- (e) the pattern of development existing on established properties in the area; and
- (f) any constraints to development,

and must have an area not less than 1200m².

The existing LDR zoning represents the only LDR land in Forcett.

P1 (a) Each lot is larger than the existing LDR lots within the cluster and have sufficient dimensions to support residential development.

(b) & (c) Future building areas are likely to resemble those on adjoining lots, with dwellings sited toward the frontage, providing large areas of private open space to the rear. This is also influenced by the topography, which slopes upward from the frontage to Arthur Highway.

(d) the lots are more than sufficient in size to provide appropriate areas of private open space.

(e) As indicated above, the lots are consistent with the pattern of existing LDR development within the cluster.

(f) Agricultural activities undertaken on the balance lot are of a low-intensity and can be undertaken in a manner which does not constrain development of the LDR lots – and all 3 x lots have areas no less than 1,200m².

The proposal complies with Clause 10.6.1.

Kind regards,

Phil Gartrell
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-----Original Message-----

ROCK SOLID GEOTECHNICS PTY LTD

6/11/2023

CLIENT:

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mjrowlandsbuilding@intas.net.au

Peter Hofto

163 Orielson Road

ORIELTON

TAS 7172

0417 960 769

peter@rocksolidgeotechnics.com.au

Geotechnical Assessment - Subdivision of Land at 701 Arthur Highway, Forcett

This report assesses the onsite wastewater potential of the land designated for a subdivision at 701 Arthur Highway, Forcett. Mitch Rowlands has proposed a three-lot subdivision of the property (Figure 1).

It is proposed to subdivide three residential lots and an access road block from the current property.

Lot 2	1100m ²	Vacant Land
Lot 3	1100m ²	Vacant Land
Lot 4	?	Access Road
Lot 5	1100m ²	Vacant Land

Each proposed residential Lot must be capable of accommodating an on-site wastewater treatment system adequate for the future use and development of the land.

For this report, it is reasonable to assume that a likely minimum future use of the proposed residential lots is the development of a three-bedroom residence and associated infrastructure.

All three proposed Residential Lots can sustain onsite wastewater systems for single residences.

INVESTIGATION

A field survey was completed on Monday 30 October, 2023, encompassing field mapping of geological and geomorphological features and hazards to assess the site for onsite wastewater disposal potential.

Two Test Holes were completed on each of the proposed residential lots utilising a 4WD mounted SAMPLA25 mechanical auger with 100mm diameter solid flight augers. The locations of the Test Holes are marked on Figure 1.

The 1:50000 Mines Department Geological Map "Sorell" indicates that the site is underlain by Permian sediments.

The land designated for subdivision lies on the southeastern corner of Bowen Court and Heatherbell Road. The new lot (Lot 1) will be accessed directly from Heatherbell Road.

Plate 1 – Land to be subdivided. Looking to the southeast.



Lot 2 – 1100m²

The block slopes at between 3 and 5 degrees to the north/northeast. The block is covered in grass and is devoid of trees.

The profile encountered in **Test Hole #1 (Plate 2)** consisted of;

- 0.00 – 0.20m silty SAND: fine grained, grey, 20% silt, trace roots & rootlets - TOPSOIL
- 0.20 – 0.55m sandy CLAY: medium plasticity, greyish brown / brown / yellowish brown, 30-35% fine to medium grained sand, some silt, moist - DISPERSIVE
- 0.55 – 0.60m gravelly SAND: fine to medium grained, yellowish brown, to 20% fine to medium angular siltstone gravel, trace silt, dry – EXTREMELY WEATHERED PERMIAN SILTSTONE
- 0.60m+ Mechanical auger refusal on siltstone bedrock

Test Hole #2 encountered a similar profile with siltstone bedrock at 0.65m depth.

Groundwater was not encountered in either test hole.

Plate 2 – Lot 2. Test Hole #1 - Looking across-slope to the east.



Lot 3 - 1100m²

The block slopes at between 3 & 5 degrees to the north. The block is covered in grass & minor reeds, & is devoid of trees.

The profiles encountered in **Test Holes #3 & #4 (Plate 3)** consisted of;

0.00 – 0.20m	silty SAND: fine grained, grey, 20% silt, trace roots & rootlets - TOPSOIL
0.20 – 0.65m	sandy CLAY: medium plasticity, greyish brown / brown / yellowish brown, 30-35% fine to medium grained sand, some silt, moist - DISPERSIVE
0.65 – 0.70m	gravelly SAND: fine to medium grained, yellowish brown, to 20% fine to medium angular siltstone gravel, trace silt, dry – EXTREMELY WEATHERED PERMIAN SILTSTONE
0.70m+	Mechanical auger refusal on siltstone bedrock

Groundwater was not encountered in either test hole.

Plate 3 – Lot 3. Test Hole #3 - Looking across-slope to the northwest.



Lot 5 – 1100m²

The block slopes at between 4 & 5 degrees to the north. The block is covered in grass & minor reeds, & is devoid of trees. A farm dam is present downslope and to the northeast of the site. The profile encountered in Test Hole #5 (Plate 4) consisted of;

0.00 – 0.20m	silty SAND: fine grained, grey, 20% silt, trace roots & rootlets - TOPSOIL
0.20 – 0.60m	silty SAND: fine grained, light yellowish & greyish brown, 20% silt, dry
0.60 – 1.50m	sandy CLAY: medium plasticity, greyish brown / brown / yellowish brown, 30-35% fine to medium grained sand, some silt, moist - DISPERSIVE
1.50 – 1.55m	gravelly SAND: fine to medium grained, yellowish brown, to 20% fine to medium angular siltstone gravel, trace silt, dry – EXTREMELY WEATHERED PERMIAN SILTSTONE
1.55m+	Mechanical auger refusal on siltstone bedrock

Test Hole #6 encountered a similar profile, but with siltstone bedrock at 0.95m depth.

Groundwater was not encountered in either test hole.

Plate 4 – Lot 5. Test Hole #5 - Looking to the northeast.



The site is classified as CLASS 6 – CLAY/BEDROCK (AS1547) w.r.t. onsite wastewater disposal.

The 2016 Director's Guidelines for Onsite Wastewater Disposal specifies;

- If dispersive soils or a limiting layer is encountered within the upper 1m of the soil profile, then the area required must be calculated based on the requirements for Category 6 soil.

All of the proposed residential lots will require the utilisation of secondary treated wastewater effluent, most probably an Aerated Wastewater Treatment System (AWTS) with a shallow sub-surface irrigation Land Application Area (LAA).

The size of the Land Application Area (LAA) / subsurface irrigation zone is conditional on the potential wastewater load entering the system and the permeability of the site. The potential wastewater load is determined by the number of bedrooms in the dwelling (as mentioned above this assessment is based on ensuring that the proposed block can sustain a residence with a minimum of three bedrooms).

A Design Irrigation Rate (DIR) of 2mm/day is appropriate (Class 6 CLAY / BEDROCK site).

3-bedroom residence	5 persons occupancy	
Tank water	120 litres/person/day	
Wastewater Load	5 x 120 litres/person/day	600 litres/day
Design Irrigation Rate (DIR)	2mm/day	Secondary treated effluent
Irrigation Area	$600 / 2 = 300m^2$	

Calculated size of the required wastewater LAA = 300m².

The Director's compliance Table part 7 (Standards for Wastewater Land Application Areas) defines certain criteria that but be complied with when installing an onsite wastewater Land Application Area (LAA). Specifically critical to this site are Criteria A2 & A3, which state;

<p>A2 Horizontal separation distance from downslope surface water to a LAA must comply with (a) or (b) (a) be no less than 100m; or (b) be no less than the following: (i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or (ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient to down slope surface water.</p>	<p>P2 Horizontal separation distance from downslope surface water to a LAA must comply with all of the following: a) Setbacks must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.</p>	<p>Complies with A2 Lots 2 & 3 comply. Lot 5 setback required, Secondary treated effluent. 5o slope. $15m + (2m \times 5^\circ) = 25m$ COMPLIES</p>
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<p>A3 Horizontal separation distance from a property boundary to a LAA must comply with either of the following: (a) be no less than 40m from a property boundary; or (b) be no less than: (i) 1.5m from an upslope or level property boundary; & (ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or (iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.</p>	<p>P3 Horizontal separation distance from a property boundary to a LAA must comply with all of the following: (a) Setback must be consistent with AS/NZS 1547 Appendix R; and (b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.</p>	<p>Complies with A3</p> <p>Secondary treated effluent.</p> <p>5° slope.</p> <p>Lower-slope boundary setback required: $1.5m + (1m \times 5°) = 6.5m$</p>
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All of the proposed residential blocks can comply with **A3**, with the following boundary setbacks;

- Secondary treated effluent
- 5° slope to northern property boundary
- Setback required from lower-slope property boundary: $1.5m + (1m \times 5°) = 6.5m$
- Setbacks of the LAA of **1.5m** are also required for the upslope and side-slope property boundaries.

All of the proposed residential blocks have suitable areas for a **300m² LAA**.

The type, size and position of onsite wastewater system will need to be determined by site specific investigation, when the details of the individual developments are determined.

RECCOMENDATIONS

All of the proposed residential lots can sustain an onsite wastewater system for a single, three-bedroom dwelling, in compliance with the *Land Use Planning and Approvals Act 1993* and the *Tasmanian Planning Scheme – Sorell Council*.

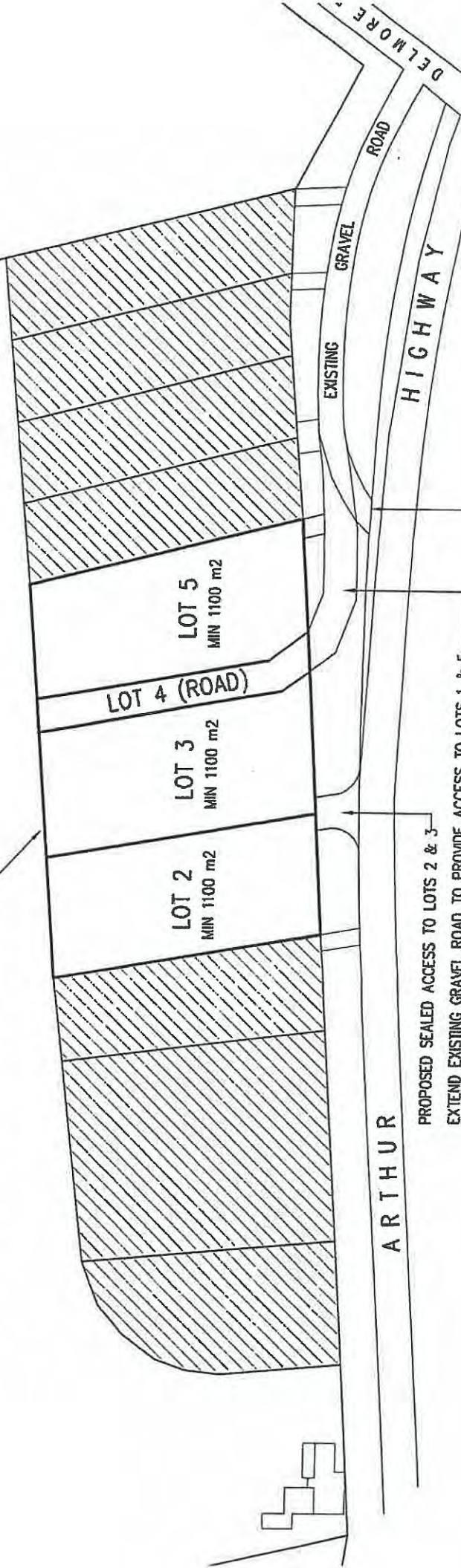


PETER HOFTO
ROCK SOLID GEOTECHNICS PTY LTD

15.95 ha

NOT INCLUDING HATCHED PORTIONS

PROPOSED SUBDIVISION APPROX 0.37 ha INCLUDING ROAD
ALL BOUNDARIES TO BE CONFIRMED BY REGISTERED SURVEYOR



PROPOSED SEALED ACCESS TO LOTS 2 & 3
 EXTEND EXISTING GRAVEL ROAD TO PROVIDE ACCESS TO LOTS 1 & 5
 BLOCK EXISTING UNAUTHORIZED ACCESS TO TASMAN HWY

NOTE: ALL ROADWORKS AND DRAINAGE SHALL COMPLY WITH MUNICIPAL STANDARD DRAWINGS

SITE PLAN (PROPOSED SUBDIVISION) SCALE 1:1000



APPROX

PROPOSED HOLIDAY CARAVAN

ROADWAY

IND AL

DRAW 1

701 ARTHUR HIGHWAY, FORCETT



GDA94 MGA55 : 551743E, 5260536N 1:846 Disclaimer and Copyright Notice

SITE AND SOIL EVALUATION REPORT

<u>Soil Category:</u> (as stated in AS/NZS 1547-2000) 1,...2,...3,...4,...5,...6	Modified Emerson Test Required If Yes, Emerson Class No.	No
<u>Soil Profile:</u>	The location of the test hole is nominated on the site plan.	
<u>Measured or Estimated Soil Permeability (m/d):</u>	0.06-0.5m/d	
<u>Design Irrigation Rate (DIR)</u>	2mm/day (Secondary Treated Effluent)	
<u>Geology:</u>	Permian sediments.	

<u>Slope:</u>	3-5 degrees
<u>Drainage lines / water courses:</u>	Nil
<u>Vegetation:</u>	Grass, reeds
<u>Site History: (land use)</u>	Rural block
<u>Aspect:</u>	North
<u>Pre-dominant wind direction:</u>	Northwest to southwest
<u>Site Stability:</u> Will on-site wastewater disposal affect site stability?	No
<u>Is geological advice required?</u>	No
<u>Drainage/Groundwater:</u>	Not encountered
<u>Depth to seasonal groundwater (m):</u>	Not Encountered
<input checked="" type="checkbox"/> <u>Water Tanks</u>	
<u>Date of Site Evaluation:</u>	30/10/2023
<u>Weather Conditions:</u>	Fine

CONDITIONS OF INVESTIGATION

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The results & interpretation of conditions presented in this report are current at the time of the investigation only. The investigation has been conducted in accordance with the specific client's requirements &/or with their servants or agent's instructions. This report contains observations & interpretations based often on limited subsurface evaluation. Where interpretative information or evaluation has been reported, this information has been identified accordingly & is presented based on professional judgement. RSG does not accept responsibility for variations between interpreted conditions & those that may be subsequently revealed by whatever means.

Due to the possibility of variation in subsurface conditions & materials, the characteristics of materials can vary between sample & observation sites. RSG takes no responsibility for changed or unexpected variations in ground conditions that may affect any aspect of the project. The classifications in this report are based on samples taken from specific sites. The information is not transferable to different sites, no matter how close (ie if the development site is moved from the original assessment site an additional assessment will be required).

It is recommended to notify the author should it be revealed that the sub-surface conditions differ from those presented in this report, so additional assessment & advice may be provided.

Investigations are conducted to standards outlined in Australian Standards:

- AS1726-1993: Geotechnical Site Investigations
- AS1547-2012: Onsite Domestic Wastewater Management

& as specified in 'Guidelines for Geotechnical Assessment of Subdivisions and Recommended Code of Practise for Site Classification to AS2870 in Tasmania' - Institute of Engineers, Tasmanian Division.

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SEARCH OF TORRENS TITLE

VOLUME 114548	FOLIO 1
EDITION 5	DATE OF ISSUE 28-Sep-2021

SEARCH DATE : 24-Jan-2024

SEARCH TIME : 10.47 AM

DESCRIPTION OF LAND

Parish of FORCETT, Land District of PEMBROKE
 Lot 1 on Plan 114548
 Being the land described in Conveyance No. 41/3924
 Excepting thereout Conv. 30/6251 Lot 9 (Diagram 25943); Lot
 10 (Diagram 25943); and Lot 11 (Diagram 25943)
 Derivation : Part of 47-2-14 Granted to W. Gunn
 Derived from W2846

SCHEDULE 1

C613719 TRANSFER to MITCHELL JAMES ROWLANDS Registered
 01-Feb-2005 at noon

SCHEDULE 2

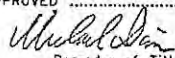
Reservations and conditions in the Crown Grant if any
 E140652 BURDENING EASEMENT: a Right of Way (appurtenant to
 Lot 11 on Diagram 25943) over the land marked Right
 of Way on Plan 114548 Registered 28-Sep-2021 at noon
 C613771 MORTGAGE to National Australia Bank Limited
 Registered 01-Feb-2005 at 12.01 PM

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations



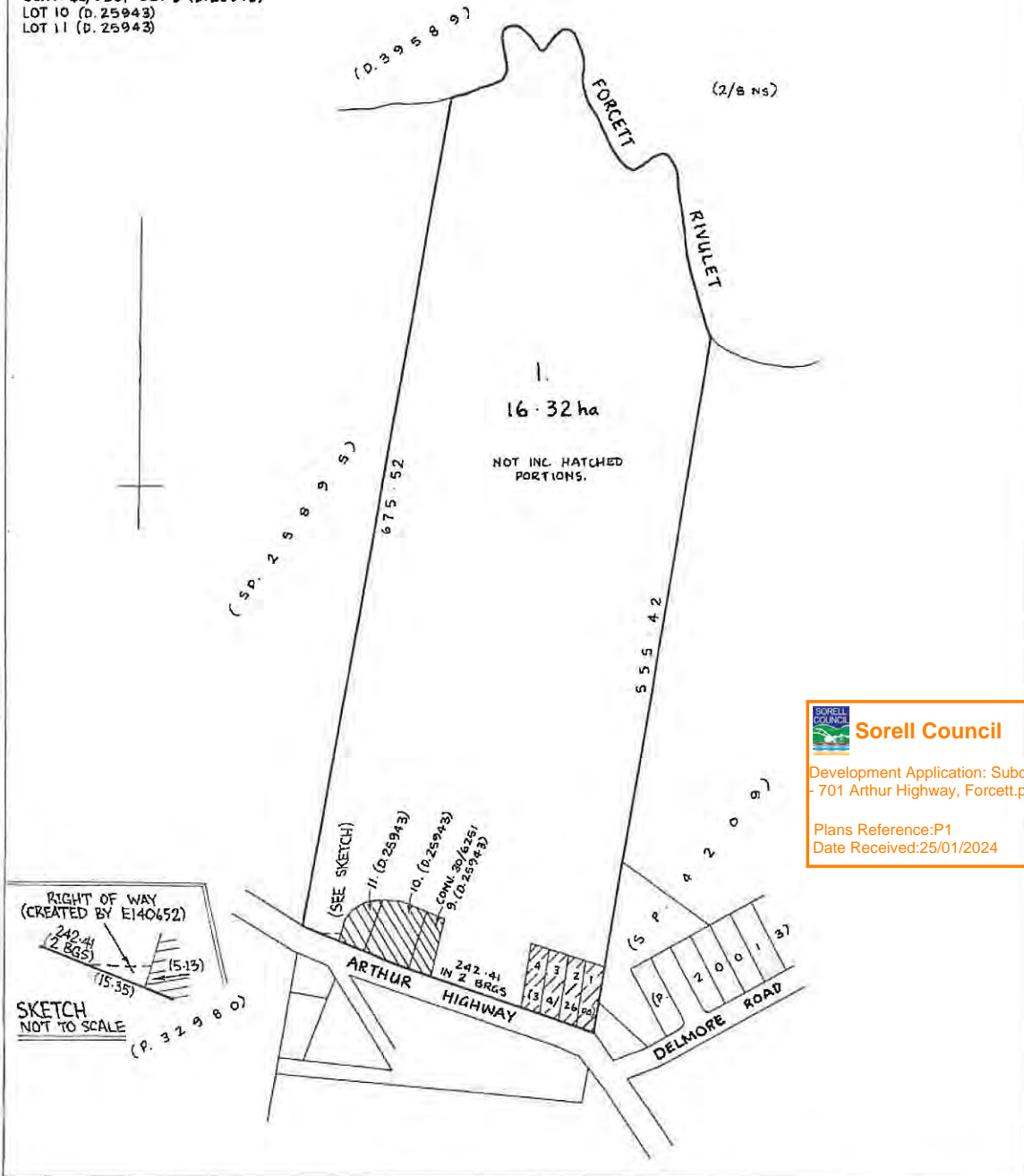
Sorell Council
 Development Application: Subdivision Application
 - 701 Arthur Highway, Forcett.pdf
 Plans Reference:P1
 Date Received:25/01/2024

FILE NUMBER W.2846 GRANTEE PART OF 47A-2R 14P - GTD TO WILLIAM GUNN.	CONVERSION PLAN		REGISTERED NUMBER P 114548
	LOCATION PEMBROKE - FORCETT		APPROVED 10 NOV 1994  Recorder of Titles
	CONVERTED FROM 41/3924		
	NOT TO SCALE LENGTHS IN METRES		
MAPSHEET MUNICIPAL CODE No. 29	LAST UPI No. 1351	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN	DRAWN DJB

SKETCH BY WAY OF ILLUSTRATION ONLY

"EXCEPTED LANDS"

CONV. 30/6251 LOT 9 (D.25943)
 LOT 10 (D.25943)
 LOT 11 (D.25943)




Sorell Council
 Development Application: Subdivision Application
 - 701 Arthur Highway, Forcett.pdf

 Plans Reference:P1
 Date Received:25/01/2024

A-183

BUSHFIRE ASSESSMENT REPORT

Proposed Three Lot (and Balance) Subdivision

Address: 701 Arthur Highway, Forcett TAS 7173

Title Reference: C.T.114548/1



Prepared by James Rogerson, Bushfire Hazard Practitioner
(BFP-161)
VERSION – 1.0
Date: 08/01/2024

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Disclaimer: The information contained within this report is based on the instructions of AS 3959-2018 the standard states that *“Although this Standard is designed to improve the performance of building when subjected to bushfire attack in a designated bushfire-prone area there can be no guarantee that a building will survive a bushfire event of every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire and extreme weather conditions.”* (Standards Australia Limited, 2011)

INTRODUCTION

1.1 Background

This Bushfire Assessment Report and associated Bushfire Hazard Management Plan (BHMP) has been prepared by James Rogerson of Rogerson and Birch Surveyors on behalf of the proponent to form part of supporting documentation for the proposed three lot (and balance) subdivision of 701 Arthur Highway, Forcett. Under the Tasmanian Planning Scheme – Sorell (TPS) and C13.0 Bushfire-Prone Areas Code it is a requirement that a subdivision application within a bushfire-prone area must accomplish a minimum Bushfire Attack Level (BAL) rating of BAL-19 for all future dwellings on newly formed allotments. This report also includes an associated BHMP which is also a requirement under C13.0.

The proposed development is within a Bushfire-Prone Area overlay and there is bushfire-prone vegetation within 100m from the site. Therefore, this site is within a bushfire-prone area.

1.2 Scope

This Bushfire Report offers an investigation and assessment of the bushfire risk to establish the level of bushfire threat and vulnerability on the land for the purpose of subdivision. This report includes the following:

- A description of the land and adjacent land, and description of the use or development that may be at threat by a bushfire on the subject site;
- Calculates the level of a bushfire threat and offers opinions for bushfire mitigation measures that are consistent with AS3959:2018 and C13.0.
- Subdivision Proposal Plan (Appendix B)
- Bushfire Hazard Management Plan (Appendix C)
- Planning Certificate (Appendix D)

1.3 Scope of BFP Accreditation

I, James Rogerson am an accredited Bushfire Practitioner (BFP-161) to assess bushfire hazards and endorse BHMP's under the the *Chief Officers Scheme for the Accreditation of Bushfire Hazard Practitioners*. I have successfully completed the *Planning for Bushfire Prone Areas Short Course* at University of Technology Sydney.

1.4 Limitations

The site assessment has been conducted and report written on the understanding that:

- The report only deals with the potential bushfire risk, all other statutory assessments are outside the scope of this report;
- The report only classifies the size, volume and status of the vegetation at the time the site assessment was conducted;
- Impacts on future development and vegetation growth have not been considered in this report. No action or reliance is to be placed on this report, other than which it was commissioned.

1.5 Proposal

The proposal is for the subdivision of current title C.T.114548/1 into 4 resultant titles including balance. See proposal plan (Appendix B).

2 PRE-FIELD ASSESSMENT

2.1 Site Details

Table 1

Owner Name(s)	Mitchell James Rowlands
Location	701 Arthur Highway, Forcett TAS 7173
Title Reference	C.T.114548/1
Property ID	5935606
Municipality	Sorell
Zoning	Low Density Residential and Agriculture
Planning Overlays	13 – Bushfire-prone Areas Code, 16 Safeguarding of Airports Code and 7 Natural Assets Code.
Water Supply for Firefighting	The property is not serviced by reticulated water. Static water supply tanks will be required for Lots 1, 2 & 3.
Public Access	Access to the development is off the Arthur Highway.
Fire History	Record fires within and west of the site from 2012-2013.
Existing Development	All-weather gravel private driveways.



Figure 1 - Location of subject site. Source: The LIST, © State of Tasmania

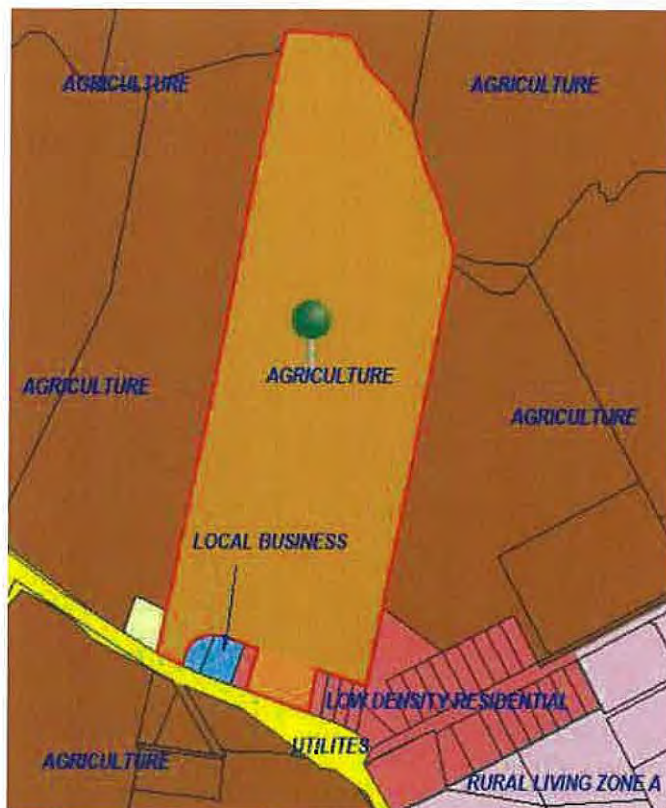


Figure 2 - Planning Scheme Zoning of site and surrounding properties. Source: The LIST, © State of Tasmania

2.2 TasVeg 4.0

There are 6 classified vegetation communities on the subject site, and the same communities on the surrounding land and parcels. Figure 3 below shows the classified vegetation from TASVEG4.0 (Source: The LIST).

Please note that TASVEG4.0 classification does not necessarily reflect ground conditions.

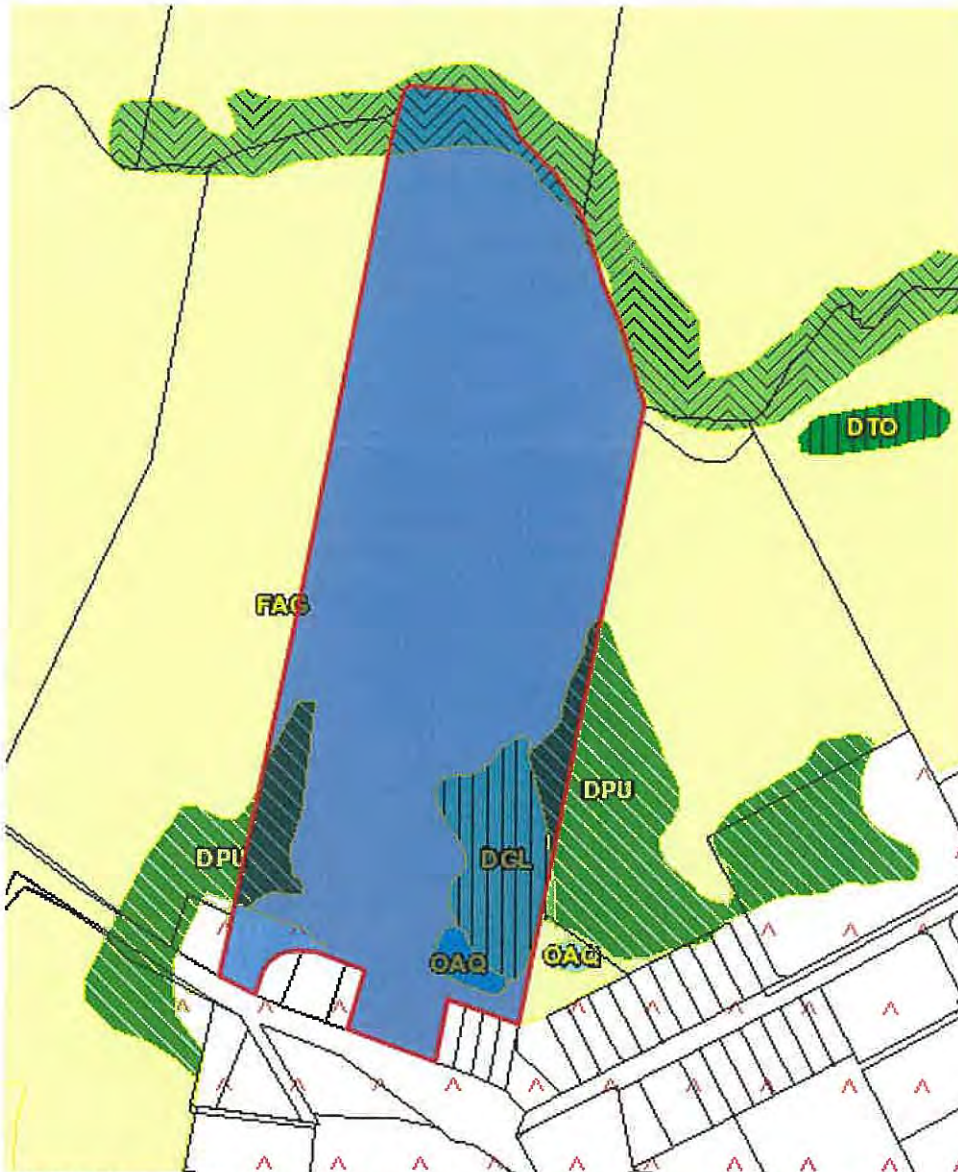


Figure 3 - TASVEG4.0 communities on subject site and surrounding land. FUR – Urban areas, FAG – Agricultural land, DFO – Eucalyptus obliqua dry forest, DPU – Eucalyptus pulchella forest and woodland, DGL – Eucalyptus globulus dry forest and woodland and OAG – Water, sea. Source: The LIST, © State of Tasmania

3 SITE ASSESSMENT

The site assessment was conducted by James Rogerson (BFP-161) on the 20th of November 2023.

3.1 Bushfire Hazard Assessment

C13.0 Bushfire Prone Areas Code defines Bushfire-prone areas as follows;

- a) Land that is within the boundary of a bushfire-prone area shown on an overlay on a planning scheme map; or*
- b) Where there is no overlay on a planning scheme map, or where the land is outside the boundary of a bushfire-prone area shown on such map, land that is within 100m of an area of bushfire –prone vegetation equal or greater than 1ha.*

The subject site is within a bushfire-prone areas overlay for the TPS, and the subject site is within 100m of an area of bushfire-prone vegetation equal or greater than 1ha. Therefore, this proposed subdivision is within a bushfire-prone area as per the TPS.

For the purposes of the BAL Assessment, vegetation within 100m of the proposed subdivision site was assessed and classified in accordance with AS3959:2018 Simplified Procedure (Method 1) (relevant fire danger index: 50-which applies across Tasmania).

BUSHFIRE THREAT DIRECTION

The Bushfire threat to this development is from the **GRASSLAND FUEL** within and surrounding the property. An additional threat is from small patches of **WOODLAND FUEL** within and surrounding the property.

Prevailing Winds: The prevailing winds for this site are primarily westerly, north westerly.

3.2 Vegetation and Effective Slope

Vegetation and relevant effective slopes within 100m of the proposed subdivision have been inspected and classified in accordance with AS 3959:2018. Effective Slope refers to the slope of the land underneath the classified bushfire-prone vegetation relative to the building site and not the slope between the vegetation and the building site. The effective slope affects a fires rate of spread and flame length and is an acute aspect of bushfire behaviour.

WITHIN THE TITLE BOUNDARY (BDY) & PROPERTY DESCRIPTION

The property is a large sized, developed, Low Density Residential and Agriculture zoned property that is in the western part of the small, rural township of Forcett. The property is located 90m before the intersection with Delmore Road off the Arthur Highway. The property is two existing titles. The property hosts various dams, and the rear (north) boundary is boarders the Forcett Rivulet. The property is orientated in a north, northeast-south, southwest aspect. The terrain within the property is gentle, sloping slightly in a northerly aspect. The property consists of a Class 1a dwelling, in addition to various Class 10a sheds, cultivated lawns and gardens and all-weather driveways. (See Figure 4 for slopes).

The land directly surrounding the dwelling and sheds is used as private open space (POS) and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (e)(f) of AS3959:2018. The remainder of the property is pasture grass, appearing in an unmanaged condition due to minimal land use and is therefore classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018. There are two patches of Eucalyptus trees on the east and west boundaries that are <10m high, have a foliage cover of <30% with an understory of grass and smaller isolated shrubs and is therefore classed as GROUP B WOODLAND per Table 2.3 of AS3959:2018.

NORTH OF THE TITLE BDY

To the north of the property (upslope) is 201 Delmore Road 'Tulendeena' (over two titles). These two properties were not assessment as they are >100m from the existing dwelling within the Balance and the proposed 3 new lots.

EAST OF THE TITLE BDY

To the east of the property (across slope) are various small sized, developed, Low Density Residential zoned residential properties, in addition to a large, developed, Agriculture Zoned property. All these properties are accessed off Delmore Road. The land directly surrounding the dwellings and sheds is used as POS and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (e)(f) of AS3959:2018.

External the POS within no. 7 Delmore Road is pasture grass, appearing unmanaged due to minimal fuel condition and is therefore classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

Land external to the POS for the remaining small Low Density Residential Zoned lots along Delmore Road is also used as POS due to the small nature of these lots and they contain mowed grass, cultivated gardens and non-combustible areas and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (f) of AS3959:2018.

No. 27 Delmore is a larger Agriculture Zoned lot, which does host a Class 1a dwelling and various Class 10a sheds. However, the land within the 100m assessment area is predominantly Eucalyptus trees that are <10m high, have a foliage cover of <30% with an understory of grass and smaller isolated shrubs and is therefore classed as GROUP B WOODLAND per Table 2.3 of AS3959:2018. Additionally, within the 100m assessment areas is pasture grass, appearing in an unmanaged condition due to minimal land use and is therefore classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

SOUTH OF THE TITLE BDY

To the south of the property (across slope and downslope >0°-5°) is the Arthur Highway. Beyond the highway are various medium to large sized, developed, Agriculture zoned properties.

On the south side of the highway in the nature strip/road reserve is some unmanaged vegetation that is between 2m and 6m high with a foliage cover of >30% and is therefore classed as GROUP D SCRUB per Table 2.3 of AS3959:2018.

The medium sized properties to the south are all developed, consisting of Class 1a dwellings and Class 10a sheds, in addition to low-cut lawns, cultivated gardens and non-combustible areas. The land directly surrounding the dwellings and sheds is used as POS and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (e)(f) of AS3959:2018. Except for no. 710 Arthur Highway, all land external to the POS within these lots is all managed land and are therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (f) per AS3959:2018. The east half of no. 710 Arthur Highway is vegetated with Eucalyptus trees that are <10m high, have a foliage cover of <30% with an understory of grass and smaller isolated shrubs and is therefore classed as GROUP B WOODLAND per Table 2.3 of AS3959:2018.

The two larger properties (15 Old Forcett Road and 708 Arthur Highway) are also developed and consist of Class 1a dwellings and Class 10a sheds, in addition to low-cut lawns, cultivated gardens and non-combustible areas. The land directly surrounding the dwellings and sheds is used as POS and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (e)(f) of AS3959:2018. The land within the 100m assessment area of no. 15 Old Forcett Road is vegetated with Eucalyptus trees that are <10m high, have a foliage cover of <30% with an understory of grass and smaller isolated shrubs and is therefore classed as GROUP B WOODLAND per Table 2.3 of AS3959:2018. The land within the 100m assessment area of no. 708 Arthur Highway is pasture grass, appearing in an unmanaged condition due to minimal land use and is therefore classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018.

WEST OF THE TITLE BDY

To the west of the property boundary (across slope) is a large, developed, Agriculture zoned lot and a small, developed, Community Purpose zoned lot. The large property has a Class 1a dwelling and various Class 10a sheds. However, the land within the 100m assessment area is predominately pasture grass, appearing in an unmanaged condition, due to minimal land use and is therefore classed as GROUP G GRASSLAND per Table 2.3 of AS3959:2018. There is a patch of vegetation on the shared boundary to the subject property with Eucalyptus trees that are <10m high, have a foliage cover of <30% with an understory of grass and smaller isolated shrubs and is therefore classed as GROUP B WOODLAND per Table 2.3 of AS3959:2018.

The small property is the Forcett Community Hall. The whole property is kept a managed condition and is therefore classed as MANAGED LAND or LOW THREAT VEGETATION per Clause 2.2.3.2 (e)(f) per AS3959:2018.

Figure 4 below shows the relationship between the subject site and the surrounding vegetation.



Figure 4 classified vegetation (within 100m of site) and existing separation from bushfire-prone vegetation (not to scale)

3.3 Bushfire Attack Level (BAL)

Table 2 - BAL rating for each lot and required separation distances

BALANCE – Existing Dwelling (Existing separation)				
DIRECTION OF SLOPE	N, NE	E, SE	S, SW	W, NW
Vegetation Classification	MANAGED GRASSLAND	MANAGED	MANAGED WOODLAND	MANAGED WOODLAND
Existing Horizontal distance to classified vegetation	95m-100m (G)	N/A	20m-100m (B)	34m & 47m -100m (B)
Effective Slope under vegetation	Downslope >0°-5°	Across slope	Across slope Downslope >0°-5°	Across slope
Exemption	(G) = >50m			
Current BAL value for each side of the site	BAL-LOW	BAL-LOW	BAL-19	BAL-12.5
Separation distances to achieve BAL-19	N/A	N/A	15m	15m
Separation distances to achieve BAL-12.5	N/A	N/A	22m	22m
Current BAL rating	BAL-19			

LOT 1 – VACANT (Indicative Building Area)				
DIRECTION OF SLOPE	N, NE	E, SE	S, SW	W, NW
Vegetation Classification	GRASSLAND	GRASSLAND MANAGED	GRASSLAND MANAGED SCRUB	GRASSLAND MANAGED
Existing Horizontal distance to classified vegetation	0m-100m (G)	0m-50m	0m-3m (G) 19m-25m (D)	0m (G)
Effective Slope under vegetation	Downslope >0°-5°	Across slope	Across slope	Across slope
Exemption				
Current BAL value for each side of the site	BAL-FZ	BAL-FZ	BAL-FZ	BAL-FZ
Separation distances to achieve BAL-19	11m	10m	19m	10m
Separation distances to achieve BAL-12.5	16m	14m	27m	14m
Current BAL rating	BAL-FZ			

LOT 2 – Vacant (Indicative Building Area)				
DIRECTION OF SLOPE	N, NE	E, SE	S, SW	W, NW
Vegetation Classification	GRASSLAND	GRASSLAND MANAGED	GRASSLAND MANAGED SCRUB	GRASSLAND MANAGED
Existing Horizontal distance to classified vegetation	0m-100m (G)	0m-26 (G)	0m (G) 21m-31m (D)	0m-25m (G)
Effective Slope under vegetation	Downslope >0°-5°	Across slope	Across slope	Across slope
Exemption				
Current BAL value for each side of the site	BAL-FZ	BAL-FZ	BAL-FZ	BAL-FZ
Separation distances to achieve BAL-19	11m	10m	19m	10m
Separation distances to achieve BAL-12.5	16m	14m	27m	14m
Current BAL rating	BAL-FZ			

LOT 3 – Vacant (Indicative Building Area)				
DIRECTION OF SLOPE	N, NE	E, SE	S, SW	W, NW
Vegetation Classification	GRASSLAND MANAGED WOODLAND	GRASSLAND MANAGED	GRASSLAND MANAGED SCRUB WOODLAND	GRASSLAND MANAGED
Existing Horizontal distance to classified vegetation	0m-15m (G) 59m-100m (B)	0m(G)	0m (G) 26m-40m (D) 40m-54m (B)	0m-48m (G)
Effective Slope under vegetation	Downslope >0°-5°	Across slope	Across slope	Across slope
Exemption				
Current BAL value for each side of the site	BAL-FZ	BAL-FZ	BAL-FZ	BAL-FZ
Separation distances to achieve BAL-19	11m	10m	19m	10m
Separation distances to achieve BAL-12.5	16m	14m	27m	14m
Current BAL rating	BAL-FZ			

3.4 Definition of BAL-LOW

Bushfire Attack Level shall be classified BAL-LOW per Section 2.2.3.2 of AS3959:2018 where the vegetation is one or a combination of any of the following Exemptions:

- a) Vegetation of any type that is more than 100m from the site.
- b) Single areas of vegetation less than 1 hectare in area and not within 100m of other areas of vegetation being classified.
- c) Multiple areas of vegetation less than 0.25 ha in area and not within 20m of the site, or each other.
- d) Strips of vegetation less than 20m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.
- e) Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.
- f) Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTE: Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100mm).

The BAL level will also be classified as BAL-LOW if Grassland fuel is >50m from the site for any effective slope per Table 2.6 of AS3959:2018.

Due to some existing developed and managed land, some separations distances are already achieved.

Where there were multiple fuel classifications and effective slopes, the predominant fuel and slope have been used in the BAL table above.

BAL ratings are as stated below:

BAL LOW	BAL 12.5	BAL 19	BAL 29	BAL 40	BAL FZ
There is insufficient risk to warrant any specific construction requirements, but there is still some risk	Ember attack and radiant heat below 12.5 kW/m ²	Increasing ember attack and windborne debris, radiant heat between 12.5 kW/m ² and 19 kW/m ²	Increasing ember attack and windborne debris, radiant heat between 19kW/m ² and 29 kW/m ²	Increasing ember attack and windborne debris, radiant heat between 29 kW/m ² and 40 kW/m ² . Exposure to flames from fire front likely	Direct Exposure to flames, radiant heat and embers from the fire front

4 BUSHFIRE PROTECTION MEASURES

4.1 Hazard Management Areas (HMA)

Hazard Management Area as described in the Code “maintained in a minimal fuel condition and in which there are no other hazards present which will significantly contribute to the spread of a bushfire”. Also as described from Note 1 of AS3959:2018 Clause 2.2.3.2 “Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm)”.

Compliance to C13.6.1

The building areas within all lots require a Hazard Management Area (HMA) to be established and maintained between the bushfire vegetation and the area at a distance equal to, or greater than specified for the Bushfire Attack Level in Table 2.6 of AS3959:2018.

Due to the size of the Balance, only the building area is to be maintained as an HMA, as it is currently and must continue to do so in perpetuity. The HMA for the Balance to be implemented prior to sealing of titles.

The whole of lots 1, 2 and 3 is to be utilized as an HMA, due to the smaller size of the lots. The HMA’s for lots 1, 2 and 3 to be implemented prior to occupancy of future habitable dwellings.

Requisite fuel removal is required for lots 1, 2 and 3 to achieve BAL-19 compliance.

Minimum separation distances for each lot are stated below.

BALANCE – Separation Distances (Existing Dwelling)				
Aspect	N, NE	E, SE	S, SW	W, NW
BAL-19	N/A	N/A	15m	15m

LOT 1 – Separation Distances (Indicative Building Area)				
Aspect	N, NE	E, SE	S, SW	W, NW
BAL-19	11m	10m	19m	10m

LOT 2 – Separation Distances (Indicative Building Area)				
Aspect	N, NE	E, SE	S, SW	W, NW
BAL-19	11m	10m	19m	10m

LOT 3 – Separation Distances (Indicative Building Area)				
Aspect	N, NE	E, SE	S, SW	W, NW
BAL-19	11m	10m	19m	10m

The Tasmanian Fire Service provides the following advice regarding the implementation and maintenance of Hazard management areas:

- Removing of fallen limbs, sticks, leaf and bark litter
- Maintaining grass at less than a 100mm height
- Removing pine bark and other flammable mulch (especially from against buildings)
- Thinning out understory vegetation to provide horizontal separation between fuels
- Pruning low-hanging tree branches (<2m from the ground) to provide vertical separation between fuel layers
- Pruning larger trees to maintain horizontal separation between canopies
- Minimize the storage of flammable materials such as firewood
- Maintaining vegetation clearance around vehicular access and water supply points
- Use of low-flammability species for landscaping purposes where appropriate
- Clearing out any accumulated leaf and other debris from roof gutters.

Additional site-specific fuel reduction or management may be required. An effective hazard management area does not require removal of all vegetation. Rather, vegetation must be designed and maintained in a way that limits opportunity for vertical and horizontal fire spread in the vicinity of the building being protected. Retaining some established trees can even be beneficial in terms of protecting the building from wind and ember attack

4.2 Public and Fire Fighting Access

Public Access

The proposed development fronts Arthur Highway. Arthur Highway is bitumen sealed and is maintained by State Growth. Arthur Highway has a nominal carriageway width of 7m. No upgrades are required to the public road and the public road complies with public access road requirements.

Property Access

Current Conditions:

Balance

The existing private access to the existing dwelling within the Balance is an all-weather gravel material driveway, which runs perpendicular off Arthur Highway, passes the dwelling on the east side between the dwelling and the Forcett Pit Stop shop and at the carport approximately 40m northeast of the dwelling. The length of the access (until adjacent with the dwelling is approximately 24m with a nominal width of 2.5m. The total approximate length of the access is 55m. Noting there is various accesses within the large property.



Figure 5 – Existing access in the Balance



Figure 6 – Existing access in the Balance

Compliance to C13.6.2

Balance

Access to the existing dwelling within the Balance is <30m, however, the access is required for a fire appliance. Therefore, the access requires some upgrades (width to min. 4m wide, construct turning head and hardstand) so the access will comply to Acceptable Solution A1 and Table 13.2 (B) of C13.6.2 demonstrated below in Table 3.

Lot 1

Access to the building area within Lot 1 is <30m, and access is not required for a fire appliance. Therefore, there are no design or construction requirements, and the access will comply to Acceptable Solution A1 and C13.6.2.

Lot 2

Access to the building area within Lot 2 is <30m, and access is not required for a fire appliance. Therefore, there are no design or construction requirements, and the access will comply to Acceptable Solution A1 and C13.6.2.

Lot 3

Access to the building area within Lot 2 is <30m, and access is not required for a fire appliance. Therefore, there are no design or construction requirements, and the access will comply to Acceptable Solution A1 and C13.6.2.

Upgrades to existing access, hardstand and turning head for the Balance to be constructed prior to sealing of titles.

Table 3 - Requirements for access length greater than 30m and less than 200m per Table C13.2 (B)

Access Standards: (access length >30m, <200m)

- a) All-weather construction;
- b) Load capacity of at least 20 t, including bridges and culverts;
- c) Minimum carriageway width of 4m;
- d) Minimum vertical clearance of 4m;
- e) Minimum horizontal clearance of 0.5m from the edge of the carriageway;
- f) Cross falls less than 3 degrees (1:20 or 5%)
- g) Dips less than 7 degrees (1:8 or 12.5%);
- h) Curves with a minimum inner radius of 10m;
- i) Maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed road; and
- j) Terminate with a turning area for fire appliances provided by one of the following
 - i. A turning circle with a minimum outer radius of 10m; or
 - ii. A property access encircling the building; or
 - iii. A hammerhead 'T' or 'Y' turning head 4m wide and 8m long.

4.3 Water Supply for Fire Fighting

Current Conditions:

Site assessment confirmed the property is not serviced by reticulated water. An existing tank for domestic use only exists within the Balance.

Compliance to C13.6.3

All lots

All lots **must** be provided with a firefighting water supply that meets the requirements for Acceptable Solution A2 of section C13.6.3 and Table C13.5.

Firefighting water supply requirements for the Balance **must** be provided prior to sealing of titles and prior to occupancy of a future habitable dwellings for lots 1, 2 and 3.

Static water supply requirements are outlined in Table 4 below which is per C13.6.3 and Table C13.5

Table 4 – Requirements for Static Water Supply per C13.6.3 and Table C13.5

- A. Distance between building area to be protected and water supply
- a) the building area to be protected must be located within 90m of the fire fighting water point of a static water supply; and
 - b) the distance must be measured as a hose lay, between the fire fighting water point and the furthest part of the building area
- B. Static Water supplies
- a) may have a remotely located offtake connected to the static water supply;
 - b) may be a supply for combined use (fire fighting and other uses) but the specified minimum quantity of fire fighting water must be available at all times;
 - c) must be a minimum of 10,000L per building area to be protected. This volume of water must not be used for any other purpose including fire fighting sprinkler or spray systems;
 - d) must be metal, concrete or lagged by non-combustible materials if above ground; and
 - e) if a tank can be located so it is shielded in all directions in compliance with section 3.5 of Australian Standard AS 3959-2009 Construction of buildings in bushfire-prone areas, the tank may be constructed of any material provided that the lowest 400mm of the tank exterior is protected by:
 - (i) metal;
 - (ii) non-combustible material; or
 - (iii) fibre-cement a minimum of 6mm thickness.
- C. Fittings, pipework and accessories (including stands and tank supports)
- Fittings and pipework associated with a fire fighting water point for a static water supply must:
- (a) have a minimum nominal internal diameter of 50mm;
 - (b) be fitted with a valve with a minimum nominal internal diameter of 50mm;
 - (c) be metal or lagged by non-combustible materials if above ground;
 - (d) if buried, have a minimum depth of 300mm [S1];
 - (e) provide a DIN or NEN standard forged Storz 65mm coupling fitted with a suction washer for connection to fire fighting equipment;
 - (f) ensure the coupling is accessible and available for connection at all times;
 - (g) ensure the coupling is fitted with a blank cap and securing chain (minimum 220mm length);
 - (h) ensure underground tanks have either an opening at the top of not less than 250mm diameter or a coupling compliant with this Table; and
 - (i) if a remote offtake is installed, ensure the offtake is in a position that is:
 - (i) visible;
 - (ii) accessible to allow connection by fire fighting equipment;
 - (iii) at a working height of 450 – 600mm above ground level; and
 - (iv) protected from possible damage, including damage by vehicles.
- D. Signage for static water connections
- The fire fighting water point for a static water supply must be identified by a sign permanently fixed to the exterior of the assembly in a visible location. The sign must:
- a) comply with water tank signage requirements within Australian Standard AS 2304-2011 Water storage tanks for fire protection systems; or
 - b) comply with the Tasmania Fire Service Water Supply Guideline published by the Tasmania Fire Service.

E. Hardstand

A hardstand area for fire appliances must be:

- a) no more than 3m from the fire fighting water point, measured as a hose lay (including the minimum water level in dams, swimming pools and the like);
- b) no closer than 6m from the building area to be protected;
- c) a minimum width of 3m constructed to the same standard as the carriageway; and
- d) connected to the property access by a carriageway equivalent to the standard of the property access.

4.4 Construction Standards

Existing and future habitable dwellings within the specified building areas on each lot must be designed and constructed to the minimum BAL ratings specified in the BHMP (Appendix C) and to BAL construction standards in accordance with AS3959:2018 or subsequent edition as applicable at the time of building approval.

The BAL-19 building setback lines on the BHMP define the minimum setbacks for habitable buildings.

Future Class 10a buildings within 6m of a Class 1a dwelling must be constructed to the same BAL as the dwelling or provide fire separation in accordance with Clause 3.2.3 of AS3959:2018.

5 STATUTORY COMPLIANCE

The applicable bushfire requirements are specified in State Planning Provisions C13.0 – Bushfire-Prone Areas Code.

Clause	Compliance
C13.4 Use or development exempt from this code	N/A
C13.5 Use Standards	
C13.5.1 Vulnerable Uses	N/A
C13.5.2 Hazardous Uses	N/A
C13.6 Development Standards for Subdivision	
C13.6.1 Provision of Hazard Management Areas.	<p>To comply with the Acceptable Solution A1, the proposed plan of subdivision must;</p> <ul style="list-style-type: none"> • Show building areas for each lot; and • Show hazard management areas between these building areas and that of the bushfire vegetation with the separation distances required for BAL 19 in Table 2.6 of <i>Australian Standard AS 3959:2018 Construction of buildings in bushfire-prone areas</i>. <p>The BHMP demonstrates that all lots can accommodate a BAL rating of BAL-19 with on-site vegetation managing and clearing for Lots 1, 2 and 3. The HMA for the Balance to be implemented prior to sealing of titles and prior to occupancy of future habitable dwellings for lots 1, 2 and 3.</p> <p>Subject to the compliance with the BHMP the proposal will satisfy the Acceptable Solution C13.6.1(A1)</p>
C13.6.2 Public and firefighting access; A1	<p>The BHMP (through reference to section 4 of this report) specifies requirements for private accesses are consistent with Table C13.2. Existing access to the Balance requires minor upgrades to meet the min. 4m width and construction of a turning head. The new or upgrades to existing accesses, turning heads and hardstands to be constructed prior to sealing to sealing of titles for the Balance and prior to occupancy of a future habitable dwellings for lots 1, 2 and 3.</p> <p>Subject to the compliance with the BHMP the proposal satisfies the Acceptable Solution C13.6.2(A1).</p>
C13.6.3 A2 Provision of water supply for firefighting purposes.	<p>Static water supply is required for all lots per C13.6.3 A2. Firefighting water supply requirements for the Balance must be provided prior to sealing of titles and prior to occupancy of a future habitable dwellings for lots 1, 2 and 3.</p> <p>Subject to the compliance with the BHMP the proposal satisfies the Acceptable Solution C13.6.3</p>

6 CONCLUSION & RECOMMENDATIONS

The proposed subdivision is endorsed that each lot can meet the requirements of Tasmanian Planning Scheme – Sorell and C13.0 Bushfire-prone Areas Code for a maximum BAL rating of BAL-19. Providing compliance with measures outlined in the BHMP (Appendix C) and sections 4 & 5 of this report.

Recommendations:

- The HMA's within the subdivision be applied in accordance with section 4.1 of this report and the BHMP (Appendix C).
- Bushfire protection measures for the Balance outlined in Sections 4.1, 4.2 and 4.3 to be implemented/constructed/installed prior to sealing of titles, and prior to occupancy of future habitable dwellings for lots 1, 2 and 3.
- Sorell Council condition the planning approval on the compliance with the BHMP (as per Appendix C).

7 REFERENCES

Department of Primary Industries and Water, The LIST, viewed January 2024, www.thelist.tas.gov.au

Standards Australia, 2018, *AS 3959:2018 – Construction of buildings in bushfire-prone areas*, Standards Australia, Sydney.

Tasmanian Planning Commission, 2015, *Tasmanian Planning Scheme – Sorell* viewed January 2024, www.iplan.tas.gov.au

Building Act 2016. The State of Tasmania Department of Premier and Cabinet. <https://www.legislation.tas.gov.au/view/html/inforce/current/act-2016-025>

Building Regulations 2016. The State of Tasmania Department of Premier and Cabinet. <https://www.legislation.tas.gov.au/view/html/inforce/current/sr-2016-110>

8 APPENDIX A – SITE PHOTOS



Figure 7 – Grassland fuel within the property (lots 1, 2 & 3, view facing SW)



Figure 8 – Grassland fuel within the property (Balance), view facing NW



Figure 9 – Grassland fuel within property (Balance), view facing SW



Figure 10 – Woodland fuel northwest of the property, view facing NW



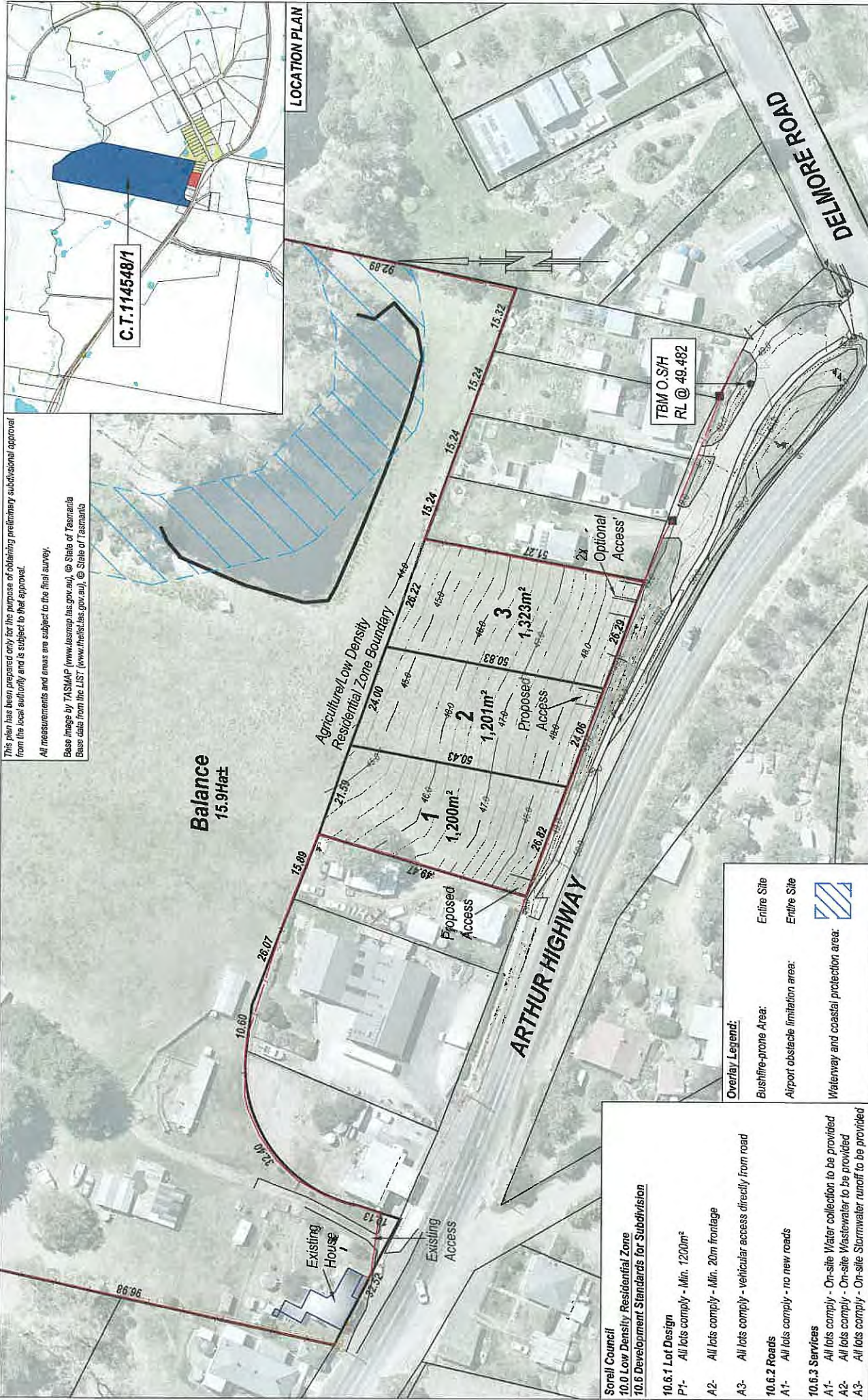
Figure 11 – Existing managed land and dwelling within the property (Balance), view facing SW



Figure 12 – Existing managed land and dwelling west of Lot 1, view facing west



9 APPENDIX B – SUBDIVISION PROPOSAL PLAN



This plan has been prepared only for the purpose of obtaining preliminary subdivisional approval from the local authority and is subject to that approval.
 All measurements and areas are subject to the final survey.
 Base image by TASMAP (www.tasmap.tas.gov.au), © State of Tasmania
 Base data from the LIST (www.theist.tas.gov.au), © State of Tasmania

C.T.114548/1

TBM O/S H
 RL @ 49.482

Balance
 15.9Ha±

LOCATION PLAN

DELMORE ROAD

ARTHUR HIGHWAY

Overlay Legend:
 Bushfire-prone Area: [Symbol]
 Airport obstacle limitation area: [Symbol]
 Waterway and coastal protection area: [Symbol]

- Sorell Council**
10.0 Low Density Residential Zone
10.6 Development Standards for Subdivision
- 10.6.1 Lot Design**
 P1- All lots comply - Min. 1200m²
 A2- All lots comply - Min. 20m frontage
 A3- All lots comply - vehicular access directly from road
- 10.6.2 Roads**
 A1- All lots comply - no new roads
- 10.6.3 Services**
 A1- All lots comply - On-site Water collection to be provided
 A2- All lots comply - On-site Wastewater to be provided
 A3- All lots comply - On-site Stormwater runoff to be provided

REV	AMENDMENTS	DRAWN	DATE	APPR.
E				
D				
C				
B				
A				

OWNER:	MITCHELL J. ROWLANDS
TITLE REFERENCE:	C.T.114548/1
LOCATION:	701 ARTHUR HIGHWAY, FORCETT

Proposed Subdivision
Date: 08/12/2023
Reference: ROWM101
Municipality: 15096-00
Scale: 1:800 (A3)
DRAWN: SORELL

UNIT 1, 2 KENNEDY DRIVE CAMBRIDGE 7170 PHONE: (03)6248 5888 EMAIL: admin@rosurveyors.com WEB: www.rosurveyors.com
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ROGERSON & BIRCH SURVEYORS



10 APPENDIX C – BUSHFIRE HAZARD MANAGEMENT PLAN

BUSHFIRE HAZARD MANAGEMENT PLAN	
LOCATION:	701 Arthur Highway, Forcett TAS 7173
TITLE REFERENCE:	C.T. 114548/1
PROPERTY ID:	5935606
MUNICIPALITY:	Sorell
DATE:	17th of January 2024 (v1.0)
SCALE:	1:750 @ A3
REFERENCE:	ROWMI01

REQUIREMENTS

- HAZARD MANAGEMENT AREAS (HMA)**
 - HMA to be established to distances indicated on this plan and as set out in Section 4.1 of the Bushfire Hazard Report.
 - Vegetation in the HMA needs to be strategically modified and then maintained in a low fuel state to protect future dwellings from direct flame contact and intense radiant heat. An annual inspection and maintenance of the HMA should be conducted prior to the bushfire season. All grasses or pastures must be kept short (<100 mm) within the HMA. Fine fuel loads at ground level such as leaves, litter and wood piles must be minimal to reduce the quantity of wind borne sparks and embers reaching buildings; and to halt or check direct flame attack.
- Some trees can be retained provided there is horizontal separation between the canopies; and low branches are removed to create vertical separation between the ground and the canopy. Small clumps of established trees and/or shrubs may act to trap embers and reduce wind speeds.
- No trees to overhang houses to prevent branches or leaves from falling on the building.
- Non-combustible elements including driveways, paths and short cropped lawns are recommended within the HMA.
- Fine fuels (leaves bark, twigs) should be removed from the ground periodically (pre-fire season) and all grasses or pastures must be kept short (<100 mm).

CONSTRUCTION STANDARDS

- Future dwellings within the specified building areas to be designed and constructed to BAL ratings shown on this plan in accordance with AS3959:2018 at the time of building approval
- Future outbuildings within 6m of a class 1a dwelling must be constructed to the same BAL as the dwelling or provide the separation in accordance with Clause 3.2.3 of AS3959:2018.

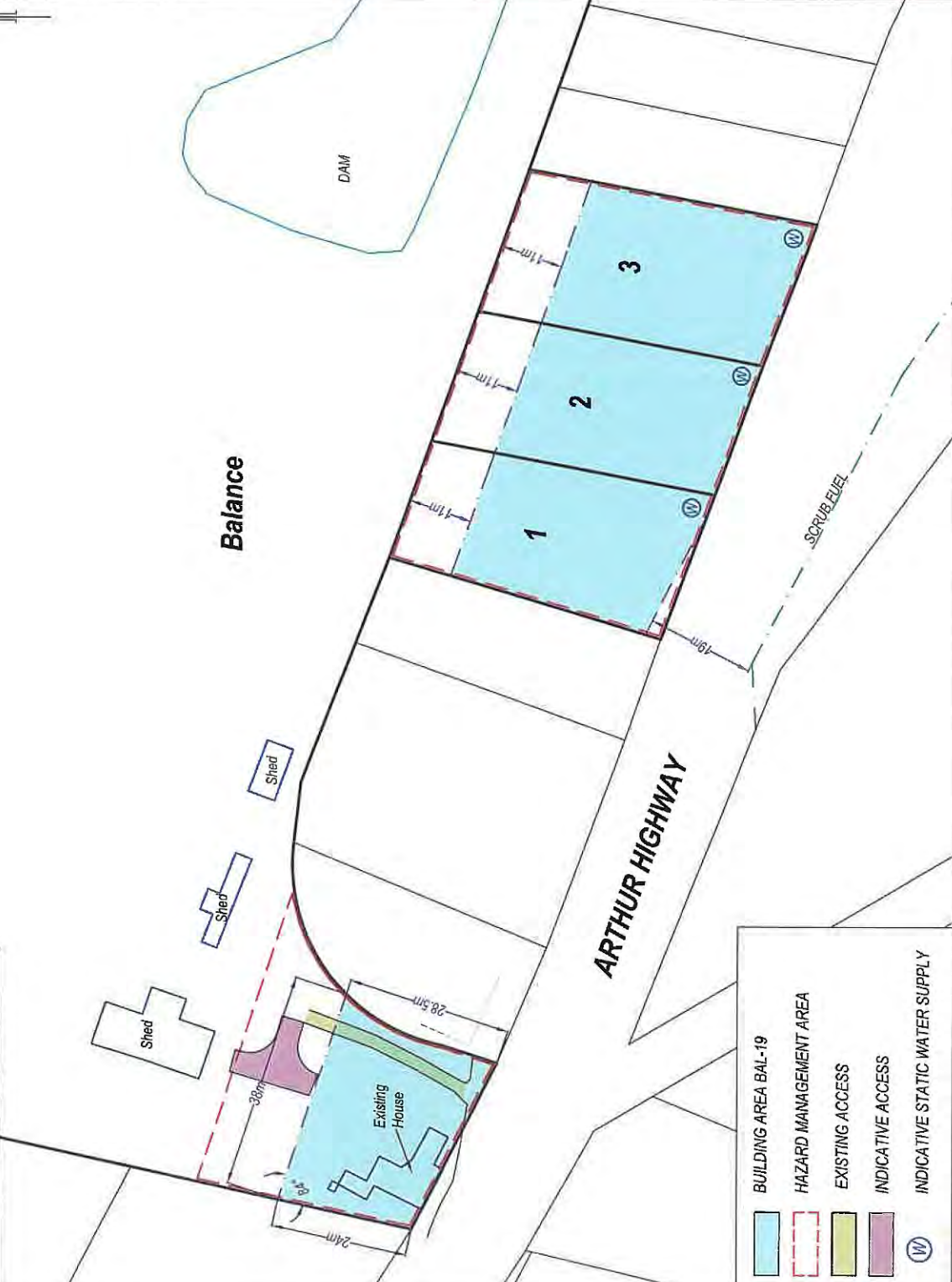
PUBLIC AND FIRE-FIGHTING ACCESS REQUIREMENTS

- Access to all lots must comply with the design and construction requirements specified in Section 4.2 of the Bush Fire Report.
- STATIC FIRE-FIGHTING WATER SUPPLY**
 - New habitable dwellings and existing dwellings must be supplied with a static water supply that is:
 - Dedicated solely for fire fighting purposes;
 - Minimum capacity of 10,000L;
 - is accessible by fire fighting vehicles and within 3.0m of a handstand area; and
 - Consistent with the specifications outlined in section 4.3 of the Bushfire Report.

This plan is to be read in conjunction with the preceding Bushfire Assessment Report "Proposer 3 Lot (and Balance) Subdivision 701 Arthur Highway, Forcett" dated 08/01/2024.

BHMP BY JAMES ROGERSON
 ACCREDITED BUSHFIRE PRACTITIONER (BFP-161), scopes: 1, 2 & 3B

- BAL rating for all lots is BAL-19**
- HMA for the Balance to be implemented prior to sealing of fillies.
 - HMA's for lots 1, 2 and 3 to be implemented prior to occupancy of a dwelling.
 - Private access upgrades and turning for the Balance to be constructed prior to sealing of fillies.
 - Static water supply tank for the Balance to be installed prior to sealing of fillies.
 - Static water supply tanks for lots 1, 2 and 3 to be installed prior to occupancy of a dwelling.



	BUILDING AREA BAL-19
	HAZARD MANAGEMENT AREA
	EXISTING ACCESS
	INDICATIVE ACCESS
	INDICATIVE STATIC WATER SUPPLY

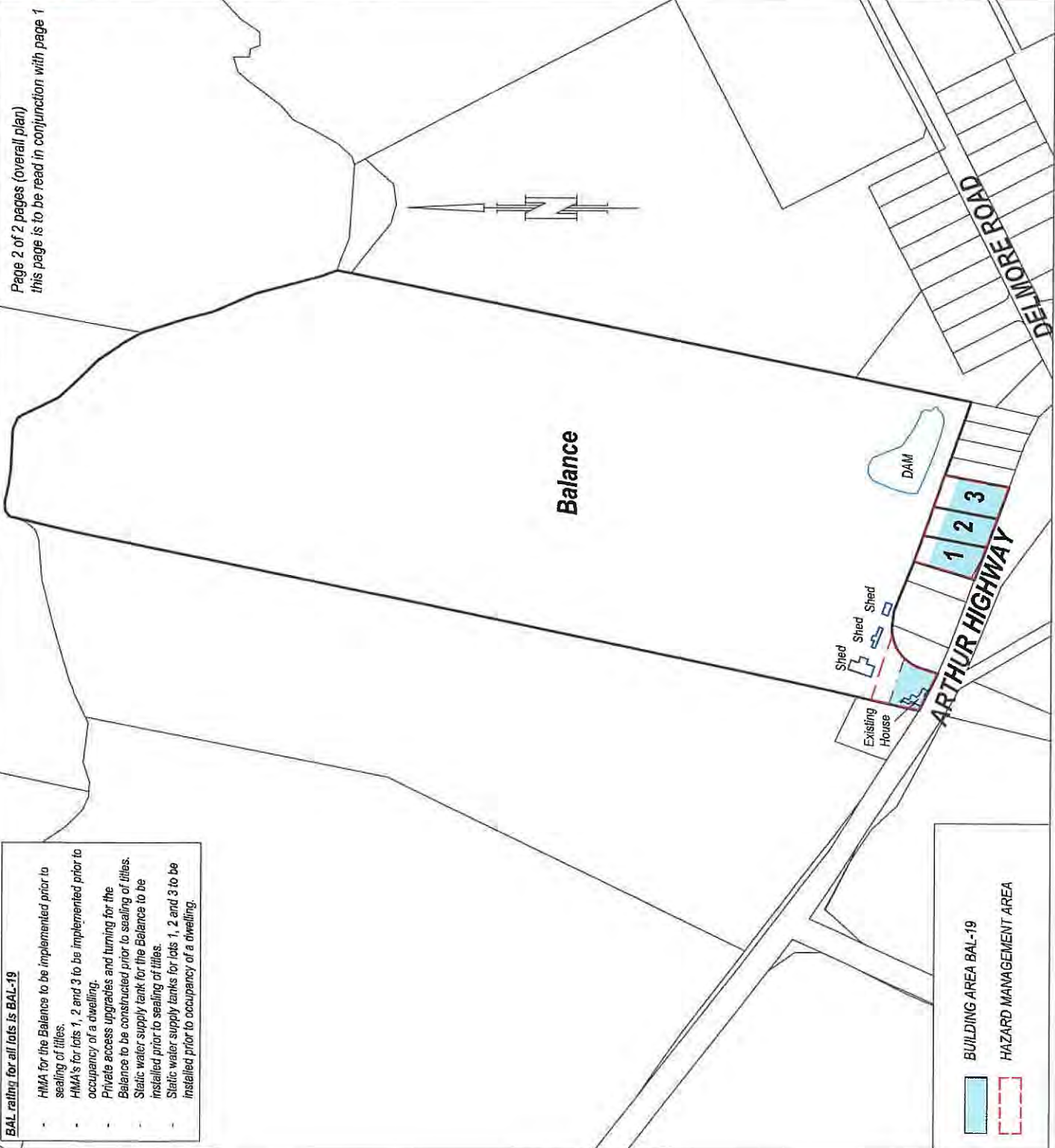
BUSHFIRE HAZARD MANAGEMENT PLAN	
LOCATION:	701 Arthur Highway, Forcett TAS 7173
TITLE REFERENCE:	C.T.114548/1
PROPERTY ID:	59355606
MUNICIPALITY:	Sorell
DATE:	17th of January 2024 (v1.0)
SCALE:	1:750 @ A3
REFERENCE:	ROWM101

- REQUIREMENTS**
- HAZARD MANAGEMENT AREAS (HMA)**
 - HMA to be established to distances indicated on this plan and as set out in Section 4.1 of the Bushfire Hazard Report.
 - Vegetation in the HMA needs to be strategically modified and then maintained in a low fuel state to protect future dwellings from direct flame contact and intense radiant heat. An annual inspection and maintenance of the HMA should be conducted prior to the bushfire season. All grasses or pastures must be kept short (<100 mm) within the HMA. Fine fuel loads at ground level such as leaves, litter and wood piles must be minimal to reduce the quantity of wind borne sparks and embers reaching buildings, and to halt or check direct flame attack.
 - Some trees can be retained provided there is horizontal separation between the canopies; and low branches are removed to create vertical separation between the ground and the canopy. Small clumps of established trees and/or shrubs may act to trap embers and reduce wind speeds.
 - No trees to overhang houses to prevent branches or leaves from falling on the building.
 - Non-combustible elements including driveways, paths and short cropped lawns are recommended within the HMA.
 - Fine fuels (leaves bark, twigs) should be removed from the ground periodically (pre-fire season) and all grasses or pastures must be kept short (<100 mm).
- CONSTRUCTION STANDARDS**
- Future dwellings within the specified building areas to be designed and constructed to BAL ratings shown on this plan in accordance with AS3959:2018 at the time of building approval
 - Future cuboid structures within 5m of a class 1a dwelling must be constructed to the same BAL as the dwelling or provide fire separation in accordance with Clause 3.2.3 of AS3959:2018.
- PUBLIC AND FIRE-FIGHTING ACCESS REQUIREMENTS**
- Access to all lots must comply with the design and construction requirements specified in Section 4.2 of the Bush Fire Report.
- STATIC FIRE-FIGHTING WATER SUPPLY**
- New habitable dwellings and existing dwellings must be supplied with a static water supply that is:
 - Dedicated solely for fire fighting purposes;
 - Minimum capacity of 10,000L;
 - Is accessible by fire fighting vehicles and within 3.0m of a hardstand area; and
 - Consistent with the specifications outlined in section 4.3 of the Bushfire Report.

This plan is to be read in conjunction with the preceding Bushfire Assessment Report "Proposer 3 Lot (and Balance) Subdivision 701 Arthur Highway, Forcett" dated 09/01/2024.

BHMP BY JAMES ROGERSON
ACCREDITED BUSHFIRE PRACTITIONER (BFP-181), scopes: 1, 2 & 3B

Page 2 of 2 pages (overall plan)
this page is to be read in conjunction with page 1



- BAL rating for all lots is BAL-19**
- HMA for the Balance to be implemented prior to sealing of tiles.
 - HMA's for lots 1, 2 and 3 to be implemented prior to occupancy of a dwelling.
 - Private access upgrades and turning for the Balance to be constructed prior to sealing of tiles.
 - Static water supply tank for the Balance to be installed prior to sealing of tiles.
 - Static water supply tanks for lots 1, 2 and 3 to be installed prior to occupancy of a dwelling.



11 APPENDIX D – PLANNING CERTIFICATE

BUSHFIRE-PRONE AREAS CODE

CERTIFICATE¹ UNDER S51(2)(d) LAND USE PLANNING AND APPROVALS ACT 1993

1. Land to which certificate applies

The subject site includes property that is proposed for use and development and includes all properties upon which works are proposed for bushfire protection purposes.

Street address:

701 Arthur Highway, Forcett TAS 7173

Certificate of Title / PID:

C.T.114548/1 / 5935606

2. Proposed Use or Development

Description of proposed Use and Development:

THREE LOT (AND BALANCE) SUBDIVISION OF C.T.114548/1

Applicable Planning Scheme:

Tasmanian Planning Scheme - Sorell

3. Documents relied upon

This certificate relates to the following documents:

Title	Author	Date	Version
SUBDIVISION PROPOSAL PLAN	ROGERSON & BIRCH SURVEYORS	08/12/2023	00
BUSHFIRE HAZARD REPORT – 701 ARTHUR HIGHWAY, FORCETT	JAMES ROGERSON – ROGERSON & BIRCH SURVEYORS	08/01/2024	1.0
BUSHFIRE HAZARD MANGAEMENT PLAN– 701 ARTHUR HIGHWAY, FORCETT	JAMES ROGERSON – ROGERSON & BIRCH SURVEYORS	17/01/2024	1.0

¹ This document is the approved form of certification for this purpose and must not be altered from its original form.

4. Nature of Certificate

The following requirements are applicable to the proposed use and development:

<input type="checkbox"/> E1.4 / C13.4 – Use or development exempt from this Code	
Compliance test	Compliance Requirement
<input type="checkbox"/> E1.4(a) / C13.4.1(a)	

<input type="checkbox"/> E1.5.1 / C13.5.1 – Vulnerable Uses	
Acceptable Solution	Compliance Requirement
<input type="checkbox"/> E1.5.1 P1 / C13.5.1 P1	<i>Planning authority discretion required. A proposal cannot be certified as compliant with P1.</i>
<input type="checkbox"/> E1.5.1 A2 / C13.5.1 A2	
<input type="checkbox"/> E1.5.1 A3 / C13.5.1 A2	

<input type="checkbox"/> E1.5.2 / C13.5.2 – Hazardous Uses	
Acceptable Solution	Compliance Requirement
<input type="checkbox"/> E1.5.2 P1 / C13.5.2 P1	<i>Planning authority discretion required. A proposal cannot be certified as compliant with P1.</i>
<input type="checkbox"/> E1.5.2 A2 / C13.5.2 A2	
<input type="checkbox"/> E1.5.2 A3 / C13.5.2 A3	

<input type="checkbox"/> E1.6.1 / C13.6.1 Subdivision: Provision of hazard management areas	
Acceptable Solution	Compliance Requirement
<input type="checkbox"/> E1.6.1 P1 / C13.6.1 P1	<i>Planning authority discretion required. A proposal cannot be certified as compliant with P1.</i>
<input type="checkbox"/> E1.6.1 A1 (a) / C13.6.1 A1(a)	
<input checked="" type="checkbox"/> E1.6.1 A1 (b) / C13.6.1 A1(b)	Provides BAL-19 for all lots (including any lot designated as 'balance')
<input type="checkbox"/> E1.6.1 A1(c) / C13.6.1 A1(c)	

<input type="checkbox"/>	E1.6.2 / C13.6.2 Subdivision: Public and fire fighting access	
	Acceptable Solution	Compliance Requirement
<input type="checkbox"/>	E1.6.2 P1 / C13.6.2 P1	
<input type="checkbox"/>	E1.6.2 A1 (a) / C13.6.2 A1 (a)	
<input checked="" type="checkbox"/>	E1.6.2 A1 (b) / C13.6.2 A1 (b)	Access complies with relevant Tables

<input type="checkbox"/>	E1.6.3 / C13.1.6.3 Subdivision: Provision of water supply for fire fighting purposes	
	Acceptable Solution	Compliance Requirement
<input type="checkbox"/>	E1.6.3 A1 (a) / C13.6.3 A1 (a)	
<input type="checkbox"/>	E1.6.3 A1 (b) / C13.6.3 A1 (b)	
<input type="checkbox"/>	E1.6.3 A1 (c) / C13.6.3 A1 (c)	
<input type="checkbox"/>	E1.6.3 A2 (a) / C13.6.3 A2 (a)	
<input checked="" type="checkbox"/>	E1.6.3 A2 (b) / C13.6.3 A2 (b)	Static water supply complies with relevant the Table.
<input type="checkbox"/>	E1.6.3 A2 (c) / C13.6.3 A2 (c)	

5. Bushfire Hazard Practitioner

Name:	JAMES ROGERSON	Phone No:	0488372283
Postal Address:	UNIT 1-2 KENNEDY DRIVE, CAMBRIDGE PARK	Email Address:	JR.BUSHFIREASSESSMENTS@G MAIL.COM
Accreditation No:	BFP – 161	Scope:	1, 2, 3B

6. Certification

I certify that in accordance with the authority given under Part 4A of the *Fire Service Act 1979* that the proposed use and development:

- Is exempt from the requirement Bushfire-Prone Areas Code because, having regard to the objective of all applicable standards in the Code, there is considered to be an insufficient increase in risk to the use or development from bushfire to warrant any specific bushfire protection measures, or
- The Bushfire Hazard Management Plan/s identified in Section 3 of this certificate is/are in accordance with the Chief Officer's requirements and compliant with the relevant **Acceptable Solutions** identified in Section 4 of this Certificate for lot 3.

Signed:
certifier

Megeeson

Name:

JAMES ROGERSON

Date:

17/01/2024

Certificate
Number:

161

(for Practitioner Use only)



Sorell Council

Development Application: Response to
Request for Information - 701 Arthur
Highway, Forcett.pdf
Plan Reference: P3
Date received: 14/03/2024

GEOTECH 24-036

ROCK SOLID GEOTECHNICS PTY LTD

9/3/2024

Mitch Rowlands 0428120843
mjrowlandsbuilding@intas.net.au

Peter Hofto
163 Orielton Road
ORIELTON
TAS 7172
0417 960 769
peter@rocksolidgeotechnics.com.au

RE: Dispersive Soils - 701 Arthur Highway, Forcett

It is proposed to subdivide three residential lots and an access-road block from the current property.

Lot 2	1100m ²	Vacant Land
Lot 3	1100m ²	Vacant Land
Lot 4	?	Access Road
Lot 5	1100m ²	Vacant Land

This Geotechnical Assessment was undertaken upon request from the Sorell Council. Specifically, council has requested an assessment pertaining to the Dispersive Soils Code – Development Standards for Subdivision (SOR-S1.8) – *Statewide Planning Scheme*).

The property is subject to the Dispersive Soils Code. Objective;

- That subdivision within an area of potentially dispersive soils minimises the potential for development to cause:
 - a) erosion; and
 - b) risk to property and the environment.
- Performance Criteria P1 – Each lot, or a lot proposed in a plan of subdivision, must minimise the risks associated with dispersive soil to property and the environment, having regard to:
 - (a) the dispersive potential of soils in the vicinity of proposed building areas, driveways, services and the development area generally;
 - (b) the potential of the subdivision to affect or be affected by erosion, including gully and tunnel erosion;

- (c) the dispersive potential of soils in the vicinity of water drainage lines, infiltration areas / trenches, water storages, ponds, dams and disposal areas;
- (d) the level or risk and potential consequence for the property and the environment from potential erosion, including gully and tunnel erosion;
- (e) management measures that would reduce risk to an acceptable level.
- (f) The advice contained in a dispersive soil management plan.

SITE ASSESSMENT

A field survey was completed on Monday 30 October, 2023, encompassing field mapping of geological and geomorphological features and hazards to assess the site for onsite wastewater disposal potential as part of the proposed subdivision. The 1:50000 Mines Department Geological Map "Sorell" indicates that the site is underlain by Permian sediments.

Two Test Holes were completed on each of the proposed residential lots utilising a 4WD mounted SAMPLA25 mechanical auger with 100mm diameter solid flight augers. The locations of the Test Holes are marked on [Figure 1](#). Each of the test holes encountered dispersive clays.

Plate 1 – Land to be subdivided. Looking to the southeast.



The risk of erosion developing due to development on this site is not significant. Sandy topsoils ensure that the clay subsoils are not and will not be exposed unless excavation of the site is undertaken.

Although the dispersive subsoils that exist over the site can be vulnerable to erosion when exposed, or when water is permitted to concentrate, the proposed development does not necessitate significant disturbance of the site. However, erosion could develop if stormwater overflow is not adequately controlled.

The Department of Primary Industries and Water publication *Dispersive Soils and their Management: Technical Reference Manual (2009) 4.0 (Appendix 1)* – “Approaches for minimising erosion risk in dispersive soils” suggests measures to reduce the risk of tunnel erosion:

- Identifying and avoiding disturbance to areas with dispersive subsoils.
- Minimising excavation of dispersive soils.
- Not allowing water to pond on the soil surface, or exposed subsoils.
- Keeping sodic sub-soils buried under topsoil.
- Maintaining vegetation cover (where possible).

Specific to this site the following measures are suggested to reduce the risk of erosion during construction and development works:

- Where possible do not unnecessarily remove or disturb topsoil.
- When construction has been completed ensure that dispersive subsoils are covered with an adequate layer of topsoil, or geotextile fabric, and revegetated where possible.
- Ensure that drains excavated in (or through) dispersive soils are revegetated.
- Ensure that stormwater overflow is adequately controlled in engineer designed trenches.

Development Standards for Subdivision

Performance Criteria P1

- (a) the dispersive potential of soils in the vicinity of proposed buildings, driveways, services and the development area generally;
Clay subsoils are dispersive over the proposed subdivision.
- (b) the potential of the development to affect or be affected by erosion, including gully and tunnel erosion;
Low potential for this project to initiate gully or tunnel erosion if management of the site is considerate of The Department of Primary Industries and Water publication *Dispersive Soils and their Management: Technical Reference Manual (2009) 4.0 (Appendix 1)* – “Approaches for minimising erosion risk in dispersive soils”
- (c) the dispersive potential of soils in the vicinity of water drainage lines, infiltration areas / trenches, water storages, ponds, dams and disposal areas;

Water drainage lines, water storages, ponds, and dams do not exist within the land proposed for subdivision. Typical residential development of the proposed blocks will require stormwater disposal via trenches. Adequately sized rainwater tanks should reduce the volume of stormwater (SW) runoff. SW trenches to be designed by a suitable qualified engineer. Onsite wastewater disposal will be via shallow subsurface irrigation of secondary treated effluent from Aerated Wastewater Treatment Systems (AWTS) directly into the topsoil above the dispersive clays. This is considered low risk.

- (d) the level or risk and potential consequence for the property and the environment from potential erosion, including gully and tunnel erosion;
Low risk if management practices adhere to the recommendations outlined above in the Department of Primary Industries and Water publication *Dispersive Soils and their Management*.
- (e) management measures that would reduce risk to an acceptable level.
See above.
- (f) The advice contained in a dispersive soil management plan.
See above.

CONCLUSIONS

Dispersive clay subsoils are present at the site proposed for subdivision at 701 Arthur Highway, Forcett.

It is the opinion of the author that sensible development of this site can be achieved and the level of risk to users of the development is minimal and acceptable.



PETER HOFTO
Rock Solid Geotechnics P/L

701 ARTHUR HIGHWAY - FORCETT



GDA94 MGA55 : 551743E, 5260536N 1:846 Disclaimer and Copyright Notice

DISPERSIVE SOILS *and* their MANAGEMENT



Guidelines for Landholders, Planners and Engineers

1.0 WHY MANAGEMENT OF DISPERSIVE SOILS IS IMPORTANT

In recent years, urban expansion has occurred in areas with dispersive soils. Disturbance of dispersive soils has resulted in tunnel erosion, damage to infrastructure, and environmental harm. Greater awareness of the difficulties posed by development on dispersive soils is required to prevent future damage. Tunnel erosion results in the formation of underground cavities that can collapse causing gully erosion and damage to infrastructure such as optical fibre cables, septic systems, roads, culverts and dwellings. Unlike other forms of erosion, tunnel erosion involves both chemical and physical processes associated with the dispersion of sodic clays. Given the difficulty of repairing tunnel erosion, management effort is focused on prevention of tunnel formation through increased understanding and awareness of the issues associated with construction and development on dispersive soils.



Figure 1. Tunnel and gully erosion resulting from construction of a stormwater culvert in dispersive clay.

2.0 WHERE DO DISPERSIVE SOILS OCCUR?

Dispersive soils and tunnel erosion occur in all municipalities in southern Tasmania, as well as parts of the Northern Midlands, Tamar Valley and Break O'Day municipalities. Dispersive soils are generally associated with soils derived from Triassic sandstone, or Permian mudstone. The location and extent of dispersive soils has not been specifically mapped in Tasmania, although broad scale land systems mapping indicates that approximately 103,000 ha of private freehold land in Tasmania contains a tunnel erosion hazard.

Tunnel erosion mostly occurs on:

- » Dispersive, or sodic soils.
- » Soils derived from Triassic sandstone and Permian mudstone.
- » Deep sedimentary soils.
- » North and northeast facing slopes.
- » Drainage lines.
- » Areas in which vegetation, soils or hydrology have been disturbed.
- » Areas with less than 700 mm annual rainfall.

3.0 IDENTIFICATION OF DISPERSIVE SOILS

- Dispersive soils can be identified by dribble patterns and pitting (Figure 2).
- Early stages of tunnel erosion can be identified by the development of 'spew holes' and fans of dispersed material ejected from tunnels (Figure 3).
- Simple field tests can be used to identify the presence of dispersive soils.
- For engineering works or infrastructure development, a combination of analytical and physical tests may be required to predict dispersive behaviour in soils.

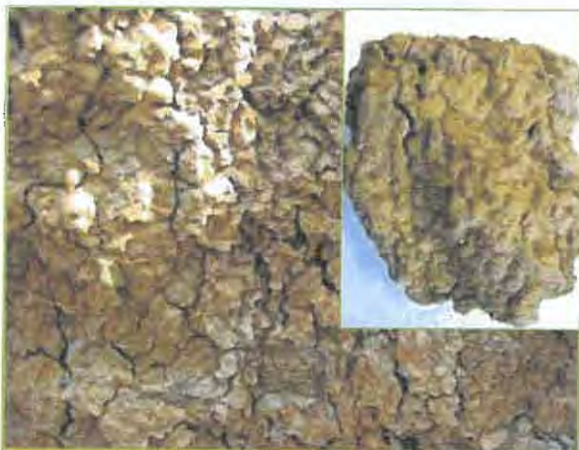


Figure 2 (a). Example of dribble pattern on an exposed subsoil, the photograph was taken from within an actively eroding tunnel system. (b) Dribble patterns on sodic soil ped.



Figure 3. Sediment fans or 'spew holes' are often the first obvious sign of tunnel erosion

SIMPLE TEST FOR IDENTIFYING DISPERSIVE SOILS

Field testing for dispersive soils can be conducted by observing the behaviour of air dried soil aggregates in distilled water or rainwater.

- 1) Collect soil aggregates (1-2 cm diameter) from each layer in the soil profile.
- 2) If moist, dry the aggregates in the sun for a few hours until approximately air dried.
- 3) Place the aggregates in a shallow glass jar or dish of distilled water or rainwater (not tap water). It may help to place the jar on black card or a dark surface. (Distilled water can be purchased at most supermarkets).
- 4) Leave the aggregates in water without shaking or disturbing them for 1 hour.
- 5) Observe and record if you can see a milky ring around the aggregates. Don't worry if the soil collapses or bubbles (figure 4).

Caution: Aggregates may not disperse when they should if they haven't been sufficiently dried. Importantly, while the presence of a milky halo indicates the presence of dispersion, the absence of a milky halo does not necessarily mean that soil will not disperse, especially after disturbance. Further testing using an approved Australian Standard technique may be required.

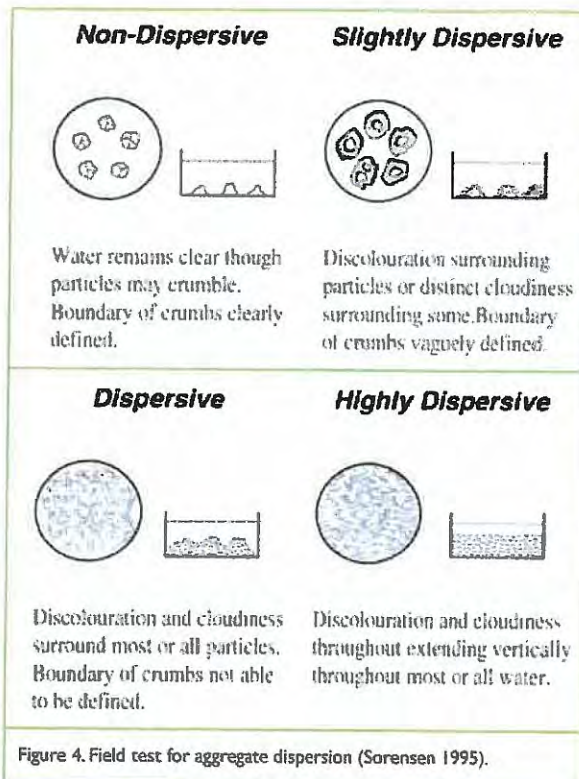


Figure 4. Field test for aggregate dispersion (Sorensen 1995).

4.0 ACTIVITIES THAT INCREASE THE RISK OF INITIATING TUNNEL EROSION

In almost all cases tunnel erosion results from some form of disturbance which allows rainwater to come into direct contact with dispersive subsoils. Activities that increase the risk of exposing dispersive subsoils to rainfall include;

- ❖ Removal of topsoil.
- ❖ Subsoil excavations (cut and fill).
- ❖ Supply of services by trenches.
- ❖ Construction of roads and culverts in dispersive soils
- ❖ Sewage and grey water disposal systems in dispersive soils
- ❖ Dam construction from dispersive clays.

Changes to hydrology, such as concentration of flow in culverts, runoff from hardened areas and ponding of rainfall may also increase the likelihood of tunnel erosion.



Figure 5. Piping failure or tunnel erosion in a dam constructed from soils derived from Permian mudstone. This dam is known to have failed on first filling. The image was taken from the dam floor.

5.0 STRATEGIES TO REDUCE RISK ASSOCIATED WITH DISTURBANCE OF DISPERSIVE SOILS

In order to prevent or repair tunnel erosion it is important to understand that unlike other forms of erosion, tunnel erosion results from chemical processes associated with dispersion of sodic subsoils. The risk of initiating tunnel erosion during construction or development of land containing dispersive soils can be minimised by;

- ❖ Identifying and avoiding disturbance to areas with dispersive subsoils.
- ❖ Minimising excavation of dispersive soils.
- ❖ Not allowing water to pond on the soil surface, or exposed subsoils.
- ❖ Keeping dispersive soils buried under topsoil.
- ❖ Maintaining vegetation cover.
- ❖ Use of gypsum or hydrated lime at appropriate rates.



Figure 6 (a). Tunnel erosion resulting from construction of a culvert in dispersive clay (b). Tunnel erosion caused by installation of optical fibre cable in dispersive soil.

RECOMMENDATIONS FOR REDUCING THE RISK OF TUNNEL EROSION IN PERI-URBAN AREAS

- » Where possible do not remove or disturb topsoil or vegetation.
- » Ensure that dispersive subsoils are covered with an adequate layer of topsoil.
- » Avoid construction techniques that result in exposure of dispersive subsoils.
- » Do not allow rainwater to pond or sit on exposed dispersive subsoils.
- » Use alternatives to 'cut and fill' construction such as pier and post foundations.
- » Where possible avoid the use of trenches for the supply of services i.e., water & power.
- » If trenches must be used, ensure that repacked spoil is properly compacted, treated with gypsum and topsoiled.
- » Consider alternative trenching techniques that do not expose dispersive subsoils.
- » Ensure runoff from hard areas is not discharged into areas with exposed dispersive soils.
- » If necessary create safe areas for discharge of runoff.
- » If possible do not excavate culverts and drains in dispersive soils.
- » Ensure that culverts and drains excavated into dispersive subsoils are capped with non-dispersive soil / spoil mixed with gypsum and vegetated.
- » Avoid use of septic trench waste disposal systems. Consult your local council about the use of above ground treatment systems.
- » Where possible do not construct dams from dispersive soils, or in areas containing dispersive soils.
- » If dams are to be constructed from dispersive clays, ensure you consult an experienced, qualified civil engineer or soil specialist before commencing construction.

With all forms of construction on dispersive soils, ensure you obtain advice and support from a suitably experienced and qualified soil professional or civil engineer before commencing work.

6.0 FURTHER INFORMATION

Comprehensive information on the management of dispersive soils in Tasmania is available in the companion document '*Dispersive Soils and Their Management: Technical Reference Manual*'. Hardie 2008, DPIW, Tasmania

Dispersive soils - high risk of tunnel erosion. Fact Sheet 2. Soil and water management on construction sites series, Department of Tourism, Arts and the Environment (DTAE).

Seek advice from your local council, the Department of Primary Industries and Water (DPIW), a suitably qualified and experienced soil specialist, or a civil engineer.

CONTACT DETAILS

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Web: www.dpiw.tas.gov.au

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Tasmania
Explore the possibilities