APPENDIX E | BHL ASSESSMENT AND BUSHFIRE MANAGEMENT PLAN

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Lot 124 and Lot 125 South Coast Highway, Lot 9001 Lower Denmark Road, Lot 44 and Lot 200		
Suburb: Marbelup and Cuthbert	**State:** WA	**P/code:** 6330
Local government area: City of Albany		
Description of the planning proposal: Scheme Amendment (Rezoning Application)		
BMP Plan / Reference Number: HD063-007	**Version:** Version 1	**Date of Issue:** 01/05/2024
Client / Business Name: Dora Porter, Brian Fuller and Barry Panizza		

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	☐	☒
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	☐	☒

Is the proposal any of the following special development types (see SPP 3.7 for definitions)?

Unavoidable development (in BAL-40 or BAL-FZ)	☐	☒
Strategic planning proposal (including rezoning applications)	☒	☐
Minor development (in BAL-40 or BAL-FZ)	☐	☒
High risk land-use	☐	☒
Vulnerable land-use	☐	☒

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

This overall proposal is for a Scheme Amendment (Rezoning Application)

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Jason Benson	Level 2	BPAD-37893	01/08/2024
Company Bio Diverse Solutions		**Contact No.** 9842 1575	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner  **Date** 01/05/2024

BHL Assessment and Bushfire Management Plan

Lot 124 and Lot 125 South Coast Highway, Lot 9001 Lower Denmark Road, Lot 44 and Lot 200

Marbelup and Cuthbert, WA 6330

Final

1/05/2024

BUSHFIRE | ENVIRONMENTAL | WATER | GIS

Site Details					
Address:	Lot 124 and Lot 125 South Coast Highway, Lot 9001 Lower Denmark Road, Lot 44 and Lot 200				
Suburb:	Marbelup and Cuthbert	**State:**	W.A.	**Postcode**	6330
Local Government Area:	City of Albany				
Description of Proposal:	Scheme Amendment (Rezoning Application)				
Stage of WAPC Planning	Rezoning				

BAL Contour Plan Details			
Report / Job Number:	HD063 -007	**Report Version:**	Final
Assessment Date:	15 February 2022	**Report Date:**	1 May 2024
BPAD Practitioner	Jason Benson (Level 2)	**Accreditation No.**	BPAD-37893
BPAD Practitioner	Kathryn Kinnear (Level 2)	**Accreditation No.**	BPAD-30794

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1. Introduction

Harley Dykstra commissioned Bio Diverse Solutions (Bushfire Consultants) on behalf of the landowners (Dora Porter, Brian Fuller and Barry Panizza) to prepare a Bushfire Management Plan (BMP) to support the proposed scheme amendment (rezoning) at Lot 124 and Lot 125 South Coast Highway, Marbelup, Lot 9001 Lower Denmark Road, Lot 44 and Lot 200, Cuthbert, within the City of Albany (CoA).

The rezoning plan provides for Rural Residential and Rural Small Holding zoned land. In the future, the area will be provided with connecting public roads, Emergency Access Ways (EAW) and various residential/rural zoned land. This BMP has been prepared to assess the whole subject site (5 lots) to the current and endorsed Guidelines for Planning in Bushfire Prone Areas Version 1.4 (WAPC, 2021) and the State Planning Policy 3.7 (WAPC, 2015). The proposed lot layout is not currently finalised and the overall proposed rezoning plan, showing the future access and zoning has been provided to indicate how it will achieve compliance to the current guidelines, see Figure 2: Zoning Plan.

The new public roads, and EAW's will be constructed linking the existing road network from Lower Denmark in the south, to South Coast Highway in the north. This BMP has been prepared to assess the overall rezoning proposal with individual BMPs over the lots proposed in subsequent planning stages.

1.1 Location

The subject site is located to the west of the Albany CBD, in the locality of Marbelup and Cuthbert, see Figure 1.

Figure 1: Location mapping of the subject site

1.2 Development Proposal

The subject sites are defined for the purpose of this BMP as Lot 124 (25.63ha) and Lot 125 (82.92ha) South Coast Highway, Lot 9001 Lower Denmark Road (100.07ha), Lot 44 (7.27ha) and Lot 200 (1.18ha) which are presently zoned as 'Rural' under the City of Albany's Local Planning Scheme No. 2 (DPLH, 2024). The proposal will include connecting public roads, Emergency Access Ways (EAW) and various residential/rural zoned land. The proposed area for rezoning is shown in Figure 2: Zoning Plan.

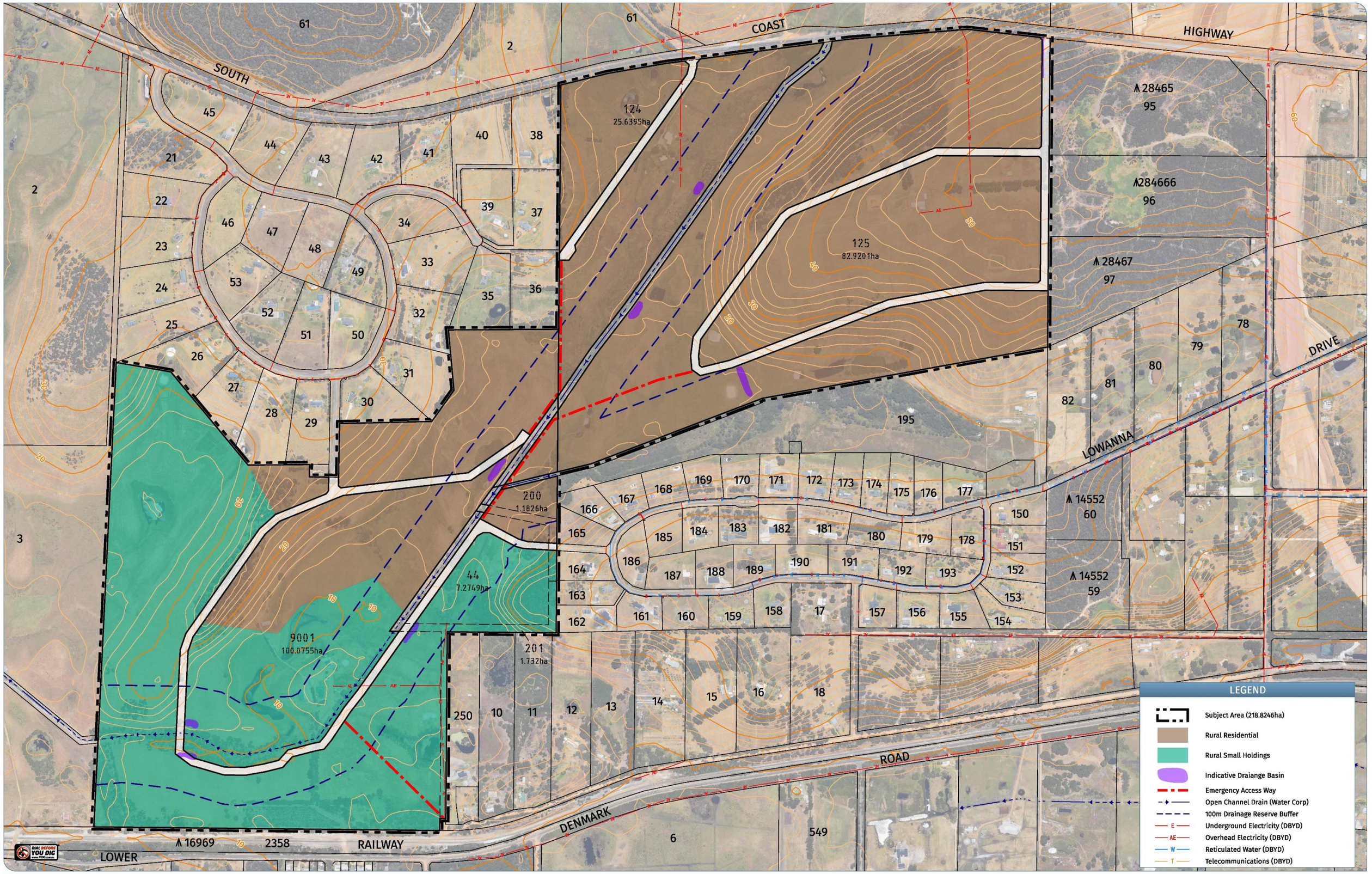

Figure 2: Zoning Plan

Lots 124 (No.47954) & 125 (No.47917) South Coast Highway,
9001 (No.688) Lower Denmark Road, MARBELUP and CUTHBERT

Plan No.	22984-05	
Date	26/03/24	
Drawn	NP	
Checked	SJ	
Revision	A	
Scale	1:6000@A2	0 10m 20m 30m

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Harley Dykstra
PLANNING & SURVEY SOLUTIONS

1.3 Bushfire Prone Area

The publicly released Map of Bushfire Prone Areas (OBRM, 2021) shows that the subject site is located within a Bushfire Prone Area (within 100m of >1ha of bushfire prone vegetation) and as such, is subject to a planning assessment of the bushfire risks. Bushfire Prone Area Mapping (OBRM, 2021) is shown in Figure 3.

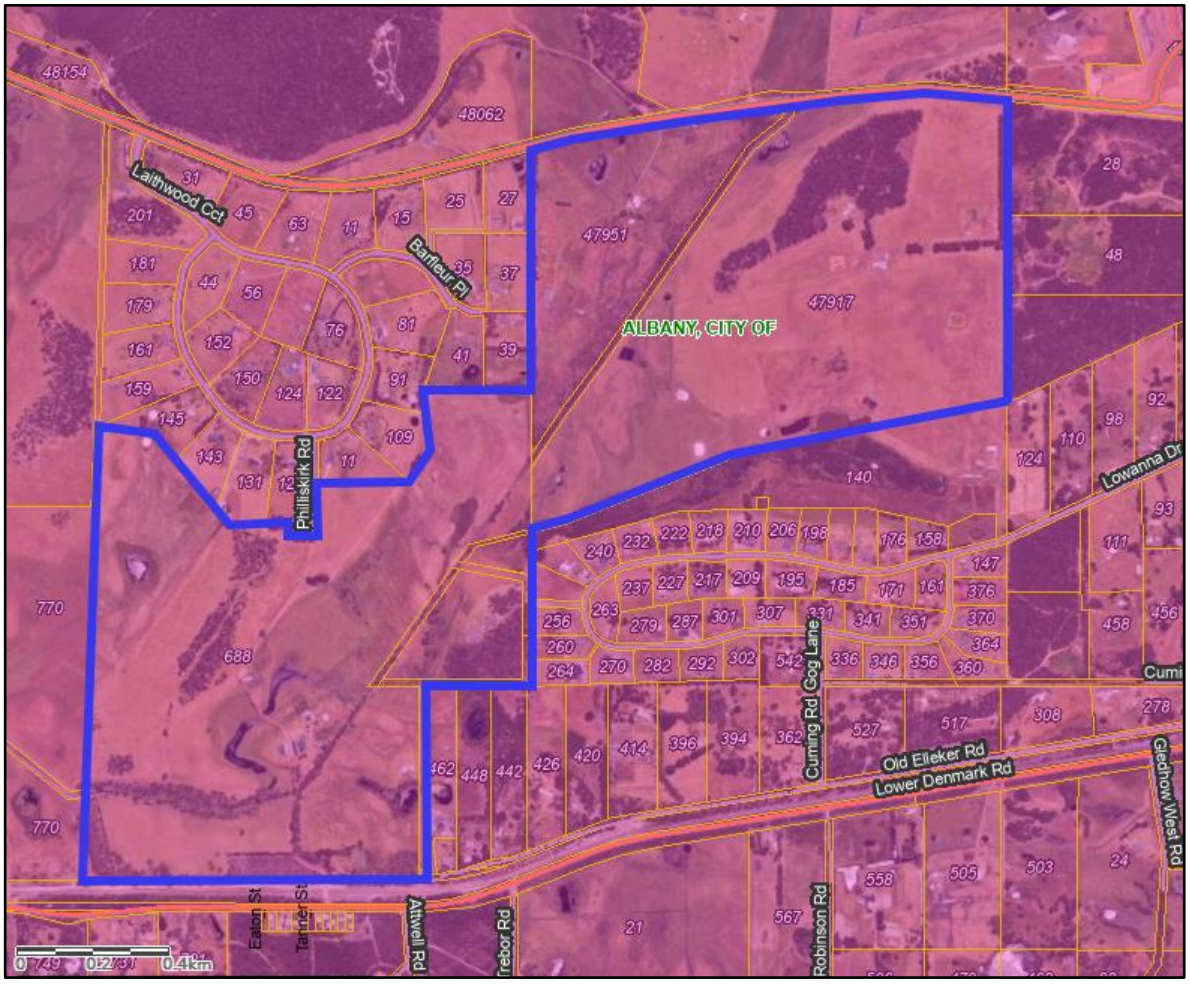


Figure 3: Map of Bushfire Prone Areas and relevance to subject site (OBRM, 2021)

1.4 Statutory Framework

This document and the recommendations contained within are aligned to the following policy and guidelines:

- *Planning and Development Act 2005*;
- *Planning and Development (Local Planning Scheme) Regulations 2015;*
- State Planning Policy (SPP 3.7) Planning in Bushfire Prone Areas 2015 (WAPC, 2015);
- Guidelines for Planning in Bushfire Prone Areas, Version 1.4 (WAPC, 2021);
- *Building Act 2011;*
- *Building Regulations 2012;*
- Building Code of Australia (National Construction Code) (NCC, n.d.);
- *Fire and Emergency Services Act 1998*;
- AS3959-2018 "Construction of Buildings in Bushfire Prone Areas" current and endorsed standards;
- *Bushfires Act 1954*; and
- CoA Fire Management Notice (CoA, 2023/24).

2 Environmental Considerations

2.1 Native Vegetation – Modification and Clearing

This BMP utilises the assumption that in the future all lots can be located in a moderate Bushfire Hazard Level (BHL) which meets the requirements of the guidelines. The site predominantly consists of grassland vegetation and some small patches of forest internal to the subject site. The removal of native vegetation is not planned as part of this proposal.

2.2 Review of the Environmental Data Sets (Landgate, 2022)

A review of the environmental data sets (Landgate, 2022) as identified in the Department of Planning, Lands and Heritage BMP Template for a complex development application, does not identify that any regulated (restricted) vegetation will be affected by the proposal, see Table 1: Environment Dataset Review.

Table 1: Environmental Dataset Review

Dataset	Impact on Proposal	Comment
Conservation category wetlands and buffer	No	A public drinking water source area (South Coast Water Reserve) and an Albany groundwater area are located to the south of the subject site.
Wetlands and Waterways	No	A creek line and seasonally inundated area is located within the site. A 100m drainage reserve buffer will be implemented as part of this proposal, see Figure 2: Zoning Plan.
Landscape Hazards	Potentially	Soil Landscape Risk - Wind and water erosion risk area covers the subject site and surrounds. Soil Landscape Quality - surface acidity and salinity risk area cover the subject site area and surrounds.
RAMSAR wetlands (DBCA-010)	No	
Threatened and Priority Flora (DBCA-036)	Unaware	There is potential for threatened flora to be impacted by this proposal. However, priority flora locations can only be seen to a scale of 1:200,000 and it is difficult to establish the level of impact this proposal will have.
Threatened Ecological Communities (DBCA-038)	No	
Bush Forever sites 2000 (DPLH-019)	No	
Clearing regulations –Environmentally Sensitive Areas (DWER-046)	No	
Swan Bioplan Regionally Significant Natural Areas 2010 (DWER-069)	No	
Conservation Covenants Western Australia (DPIRD-023)	Unaware	This dataset is not publicly available.

Note: The management strategies contained in this report, assume that all environmental approvals will be achieved.

2.3 Revegetation or Landscaping

There are several indicative drainage basins indicated on Figure 2: Zoning Plan. In the future, the drainage basins will be revegetated as per the associated Local Water Management Strategy (LWMS) for the site. It is estimated that the likely revegetation will consist of sedges, rushes, and reeds. The likely classification of this area will be Shrubland Type C and will not negatively impact on the BAL ratings over future lots. Drainage basins are not located close to dwellings with large rural and small residential rural lots proposed and will not increase the overall bushfire risk for the proposed rezoning plan area. A BAL contour plan will be completed over the site at the subdivision stage. An accredited Level 2 Bushfire Practitioner is to review and approve any future planting, revegetation, or landscaping within the development area to ensure the planting does not increase the potential bushfire risk.

3 Bushfire Assessment Results

The bushfire assessment for this site has followed the Bushfire Attack Level (BAL) Assessment and WAPC Planning in Bushfire Prone Areas Guidelines Version 1.4 (WAPC, 2021).

3.1 Assessment Inputs

Bushfire Assessment inputs for the site have been calculated using the Method 1 BAL Assessment procedure as outlined in AS3959-2018. This incorporates the following factors:

- WA adopted Fire Danger Index (FDI), being FDI 80;
- Vegetation Classes;
- Effective Slope under classified vegetation; and
- Distance between proposed development site and classified vegetation.

3.1.1 Vegetation Classification

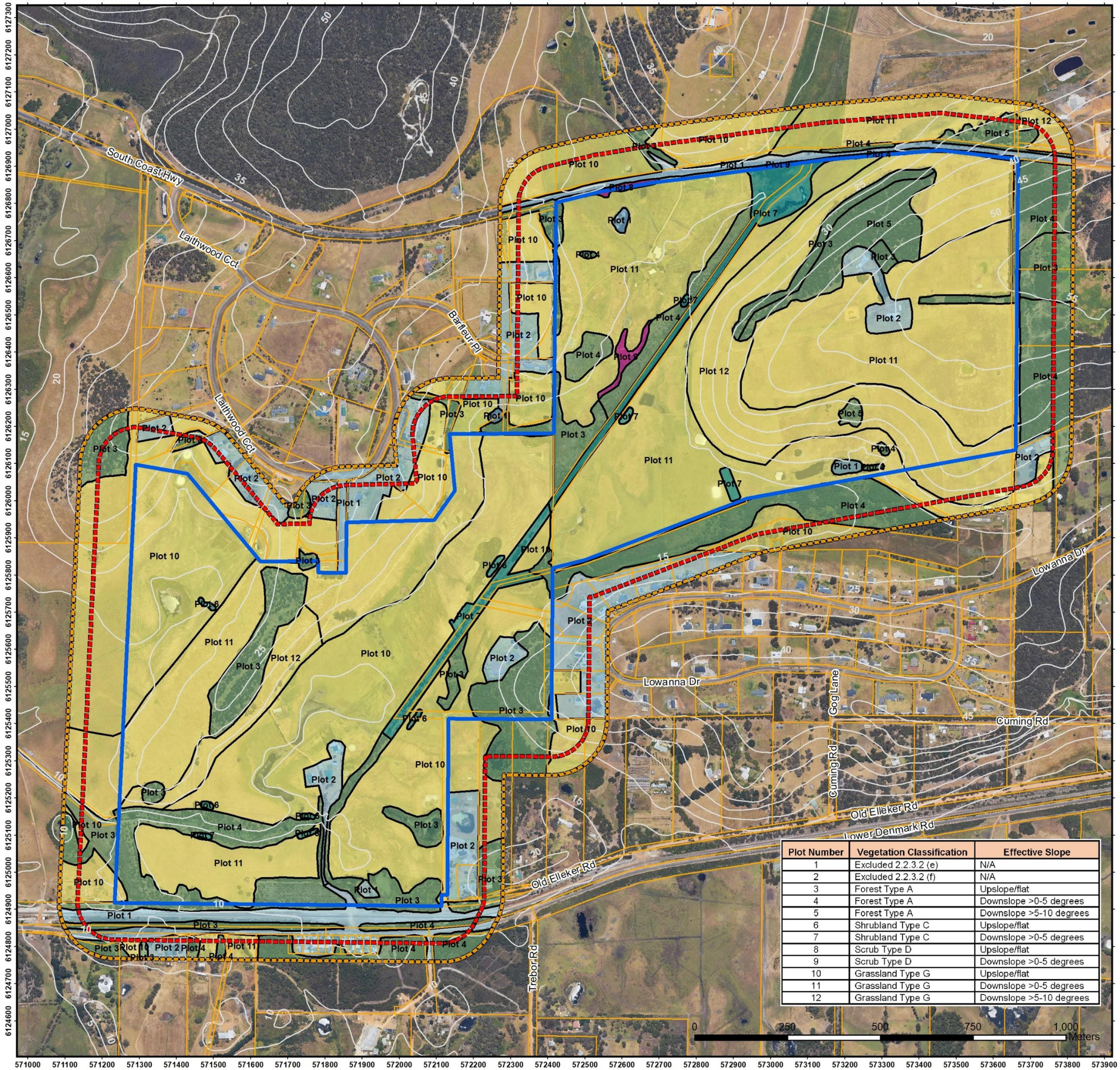
Site assessment occurred on the 12th October 2021 by Kathryn Kinnear (Level 2 BPAD-30794) and the 19th October 2021 by Jason Benson (Level 2 BPAD-37893). Site conditions have not changed since the 2021 site assessments with subsequent site checks since original assessment occurred in 2023/2024 during the preparation of this report. All vegetation within 150m of the site/proposed development was classified in accordance with Clause 2.2.3 of AS3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified in the following pages and shown on Figure 4: Overall Vegetation Classification Map on the following page. Further detail on vegetation classification and plot data can be obtained by reviewing the Original Vegetation Classifications to AS3959 for the northern and southern sites in Appendix A and Appendix B of this report.

A summary of the combined overall plot data for the site assessed as per Clause 2.2.3 of AS3959-2018 is provided below in Table 2 below.

Table 2: Overall Vegetation Classification Table (in accordance with AS3959-2018) of the subject site

Plot Number	Vegetation Classification	Effective Slope
1	Excluded 2.2.3.2 (e)	N/A
2	Excluded 2.2.3.2 (f)	N/A
3	Forest Type A	Upslope/flat
4	Forest Type A	Downslope >0-5 degrees
5	Forest Type A	Downslope >5-10 degrees
6	Shrubland Type C	Upslope/flat
7	Shrubland Type C	Downslope >0-5 degrees
8	Scrub Type D	Upslope/flat
9	Scrub Type D	Downslope >0-5 degrees
10	Grassland Type G	Upslope/flat
11	Grassland Type G	Downslope >0-5 degrees
12	Grassland Type G	Downslope >5-10 degrees

Note: *The above table indicates the combined overall vegetation for the entire site. Originally, the northern and southern sites were assessed independently. The original vegetation classifications report to AS3959 for the northern and southern sites can be found in Appendix A and B of this report. Plot numbering in the overall vegetation map differs slightly to the original assessments.*



Plot Number	Vegetation Classification	Effective Slope
1	Excluded 2.2.3.2 (e)	N/A
2	Excluded 2.2.3.2 (f)	N/A
3	Forest Type A	Upslope/flat
4	Forest Type A	Downslope >0-5 degrees
5	Forest Type A	Downslope >5-10 degrees
6	Shrubland Type C	Upslope/flat
7	Shrubland Type C	Downslope >0-5 degrees
8	Scrub Type D	Upslope/flat
9	Scrub Type D	Downslope >0-5 degrees
10	Grassland Type G	Upslope/flat
11	Grassland Type G	Downslope >0-5 degrees
12	Grassland Type G	Downslope >5-10 degrees

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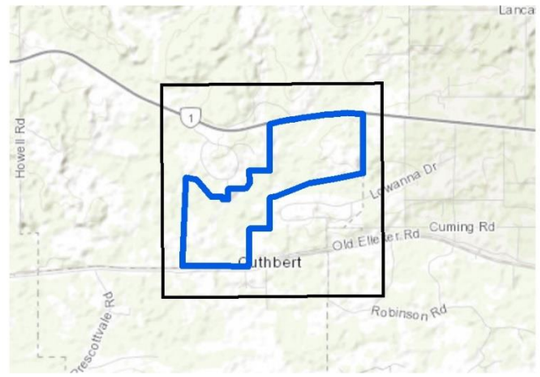

Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 5m Contours
- Vegetation/Plot Boundary

Vegetation

- Forest Type A
- Shrubland Type C
- Scrub Type D
- Grassland Type G
- Excluded 2.2.3.2

Scale
1:10,000 @ A3
GDA MGA 2020 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2022
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Harley Dykstra & Barry Panizza
Lot 124 No 47951 & 125 No 47917 South Coast Highway
& Lot 9001 No 688 Lower Denmark Road Marbelup Cuthbert
Cuthbert WA 6330

Figure 4: Overall Vegetation Classification Map

BAL Assessor	*QA Check*	*Drawn by*
JRB	**MKG**	**GSK**
STATUS	*FILE*	*DATE*
FINAL	**HD063-007**	**01/05/2024**

3.2 Assessment Outputs (Bushfire Hazard Level)

The BHL process provides an indication of the likely impact of a bushfire event as it interacts with the bushfire hazards within and adjacent to the site. The BHL is a measure of the likely intensity of a bushfire and the likely level of bushfire attack on a site by categorizing the hazard (WAPC, 2021). The allocation of category of the bushfire hazard is determined as per Table 3 of the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2021), as shown on Figure 5.

Table 3: BHL and classified vegetation (as per AS-3959)

HAZARD LEVEL	CHARACTERISTICS
Extreme	• Class A: Forest • Class B: Woodland (05) • Class D: Scrub • Any classified vegetation with a greater than 10 degree slope
Moderate	• Class B: Open woodland (06), Low woodland (07), Low open woodland (08), Open shrubland (09)* • Class C: Shrubland • Class E: Mallee/Mulga • Class G: Grassland, including sown pasture and crops • Vegetation that has a low hazard level but is within 100 metres of vegetation classified as a moderate or extreme hazard, is to adopt a moderate hazard level.
Low	• Low threat vegetation may include areas of maintained lawns, golf courses, public recreation reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks. • Managed grassland in a minimal fuel condition (insufficient fuel is available to significantly increase the severity of the bushfire attack). For example, short-cropped grass to a nominal height of 100 millimetres. • Non-vegetated areas including waterways, roads, footpaths, buildings and rock outcrops.

Figure 5: BHL Assessment allocation of category (WAPC, 2021)

3.3 Potential Bushfire Impacts - BHL allocation

The potential bushfire impact to the site/proposed development from each of the identified vegetation plots are presented in Table 3 and shown in Figure 6: BHL Map.

Table 3: Potential Bushfire impacts to the Site (BHL)

Plot Number	Vegetation Type (Table 2.3)	Effective Slope (Table2.4.3)	BHL Allocation
1	Excluded 2.2.3.2 (e)	N/A	Low
2	Excluded 2.2.3.2 (f)	N/A	Moderate
3	Forest Type A	Upslope/flat	Extreme
4	Forest Type A	Downslope >0-5 degrees	Extreme
5	Forest Type A	Downslope >5-10 degrees	Extreme
6	Shrubland Type C	Upslope/flat	Moderate
7	Shrubland Type C	Downslope >0-5 degrees	Moderate
8	Scrub Type D	Upslope/flat	Extreme
9	Scrub Type D	Downslope >0-5 degrees	Extreme
10	Grassland Type G	Upslope/flat	Moderate
11	Grassland Type G	Downslope >0-5 degrees	Moderate
12	Grassland Type G	Downslope >5-10 degrees	Moderate

NOTES ON BHL ASSESSMENT

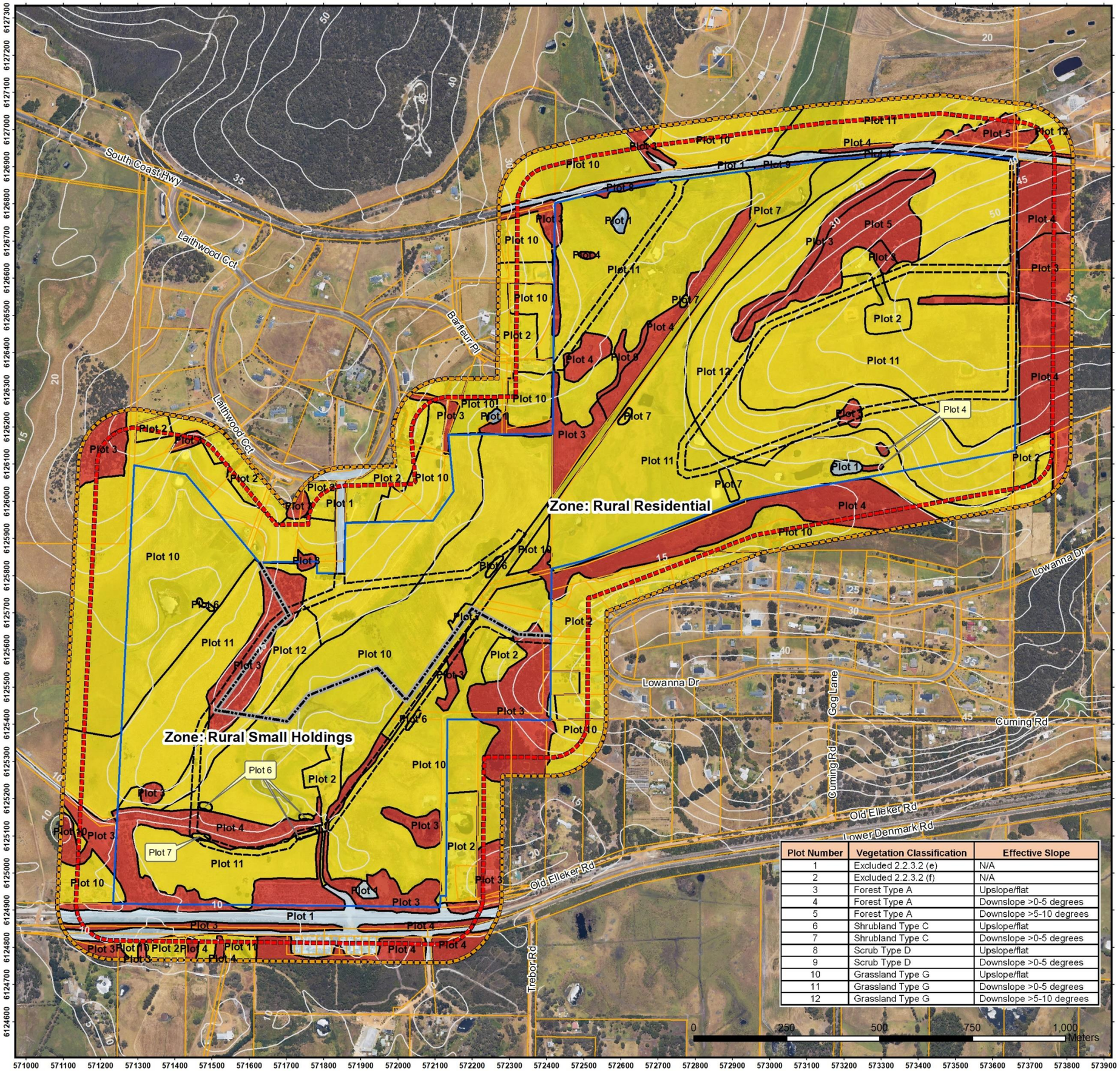
- The BHL assessment was prepared by an Accredited Level 2 Bushfire Planning Practitioner (BPAD-37893);
- The BHL Assessment and Map has been prepared in accordance with the current endorsed Department of Planning, Lands and Heritage (WAPC) Guidelines for Planning in Bushfire Prone Areas Version 1.4 (WAPC, 2021);
- The majority of the site is subject to a Moderate BHL with some areas of extreme BHL due to the remanent vegetation internal to the site. The plan is to retain as much vegetation as possible while keeping future lots in a moderate/low BHL;
- The area proposed for Rural Residential and Rural Small Holding is currently subject to a moderate BHL;
- The internal remitment vegetation predominantly consists of forest which is defined as an extreme BHL. However, appropriate separation distances can be achieved for future developments;
- The assumptions contained within this report are based on the Zoning Plan as supplied by the client (Figure 2); and
- Subject site is located in a Bushfire Prone Area; see Figure 3 (OBRM, 2021).

Note on internal vegetation

The lot contains significant areas of internal grasslands which are mapped as a moderate bushfire hazard. Internal to the subject site to the east of the small lot is a small area of Forest Type A (refer to Figure 4: Overall Vegetation Classification Map). Onsite vegetation is within the control of the landowner and therefore can potentially be removed or modified to lower the bushfire risk, subject to approval. Offsite vegetation is not within the control of the landowner. This vegetation cannot be removed or modified by the landowner and as a result bushfire threat from offsite vegetation is unable to be reduced. Bushfire management measures external to the subject site are not required as part of this proposal. For the required separation distances from each vegetation plot to achieve a BAL-29 compliant Asset Protection Zone (APZ), refer to Table 4.

Table 4: Separation Distances to achieve BAL-29 from each Vegetation Plot (BAL-29 APZ)

BAL-29 Asset Protection Zone				
Plot Number	**Vegetation Classification**	**Effective Slope Degrees**	**Achievable BAL Rating**	**Minimum Separation Distance Required (metres)**
3	Forest Type A	Upslope/flat	BAL-29	21
4	Forest Type A	Downslope >0-5 degrees		27
5	Forest Type A	Downslope >5-10 degrees		33
6	Shrubland Type C	Upslope/flat		9
7	Shrubland Type C	Downslope >0-5 degrees		10
8	Scrub Type D	Upslope/flat		13
9	Scrub Type D	Downslope >0-5 degrees		15
10	Grassland Type G	Upslope/flat		8
11	Grassland Type G	Downslope >0-5 degrees		9
12	Grassland Type G	Downslope >5-10 degrees		10



Plot Number	Vegetation Classification	Effective Slope
1	Excluded 2.2.3.2 (e)	N/A
2	Excluded 2.2.3.2 (f)	N/A
3	Forest Type A	Upslope/flat
4	Forest Type A	Downslope >0-5 degrees
5	Forest Type A	Downslope >5-10 degrees
6	Shrubland Type C	Upslope/flat
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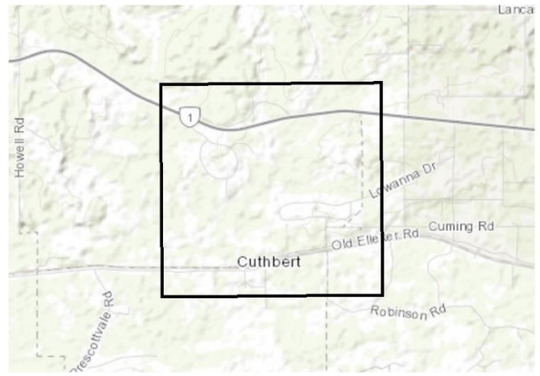

Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 5m Contours
- Road Layout
- Zone Boundary
- Vegetation/Plot Boundary

Bushfire Hazard Level

- Extreme
- Moderate
- Low

Scale
1:10,000 @ A3
GDA MGA 2020 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2022
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Harley Dykstra & Barry Panizza
Lot 124 No 47951 & 125 No 47917 South Coast Highway
& Lot 9001 No 688 Lower Denmark Road Marbelup Cuthbert
Cuthbert WA 6330

Figure 6: BHL Map (Pre and Post Development)

BAL Assessor	*QA Check*	*Drawn by*
JRB	**MKG**	**GSK**
STATUS	*FILE*	*DATE*
FINAL	**HD063-007**	**01/05/2024**

4 Identification of Bushfire Hazard Issues

4.1 Bushfire Hazard Level

The identified bushfire risks associated with the subject sites are patches of remnant native vegetation internal to the site and external in the north, east, south and west of the subject site, including north of South Coast Highway, west in paddock areas, south near Cuthbert townsite and west in small rural land holdings. Remnant forest areas presents as predominantly Forest Type A which is defined as an Extreme Bushfire Hazard Level (BHL). Under hot, dry and unstable conditions (Extreme to Catastrophic bushfire weather) the subject site is most at risk from bushfire from these directions.

Internal to the site in the north, east, south and west and external in the north, south and west are large areas of paddock/pasture (Grassland Type G), if left unmanaged this grassland vegetation poses a moderate BHL to the proposed development. To the southeast and northwest of the development site, existing rural residential areas occur (Lowanna Drive and Laithwood Circuit) which is predominately low fuel, presenting a Low BHL. Post development all future lots can be located within a moderate BHL, which is consistent with the acceptable solutions of the WAPC guidelines.

The predominant internal vegetation is Grassland Type G, which can easily be modified and maintained in a low threat state, as per Appendix C: Schedule 1 WAPC Asset Protection Zone (APZ) standards to apply to ensure BAL-29 or lower can be achieved for all future lots. The establishment of future APZ's on individual lots will be established at the subdivision stage. If the rezoning plan and subsequent subdivision application are approved, ongoing management of vegetation compliance will be regulated via the BMP for the site and the prevailing CoA Fire Management Notice. A detailed BAL contour plan will be prepared at future Western Australian Planning Commission (WAPC) subdivision stage/s.

Given the moderate to extreme bushfire risk associated with the site, it is recommended that planting guides are given to new lot owners indicating more flammable/less flammable plant species. This can assist in the land owner's decision making in the establishment and development of their lot. The predominant onsite vegetation modification will consist of the management of grasses in paddock areas and the ongoing management of new planted vegetation in the rural/rural residential lots, which can increase the bushfire risk of the area if left unmanaged.

4.2 Climate

The closest Bureau of Meteorology (BoM) site is Albany (009500). Albany's long-term mean annual rainfall is approximately 925.2 mm though there can be considerable variation in the total rainfall from year to year. Approximately 75 per cent of the annual rainfall occurs between May and October. Although cold fronts are responsible for much of the recorded rainfall total, a moist onshore flow can occur in any season and bring showers or drizzle along the south coast. Albany records rainfall on average 103.5 (≥1mm) rain days annually (BoM, 2022). July is the wettest month (long term average of 142.8mm). The driest month is February with a long-term average of 22.6 mm.

The average maximum temperatures peak in January and February, with monthly means of 22.8°C and 22.9°C (respectively) although temperatures above 35°C sometimes occur when hot, dry northerly winds arrive from the interior of WA. Overnight minimums also peak in January and February at a mild 15.6°C, on average. Winter daily maximum temperatures average approximately 15.8°C (July), while the average minimum is approximately 8.2°C to 8.5°C in July and August (respectively).

The dominant wind direction in summer is from the east and afternoon sea breezes occur from the south west/south east. During winter, southwest winds prevail and northwest storm events occur (BoM, 2022). Although fronts and depressions may bring strong to gale force winds, winter winds are more variable and generally lighter than those of summer. Please refer to Figures 7 to 10.

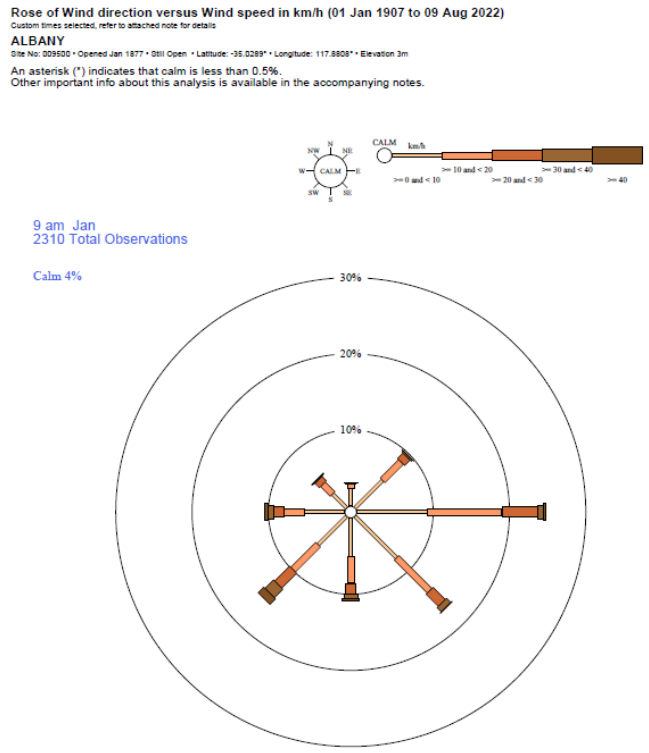


Figure 7: Albany Summer (Jan) 9am wind rose. (BOM, 2022)

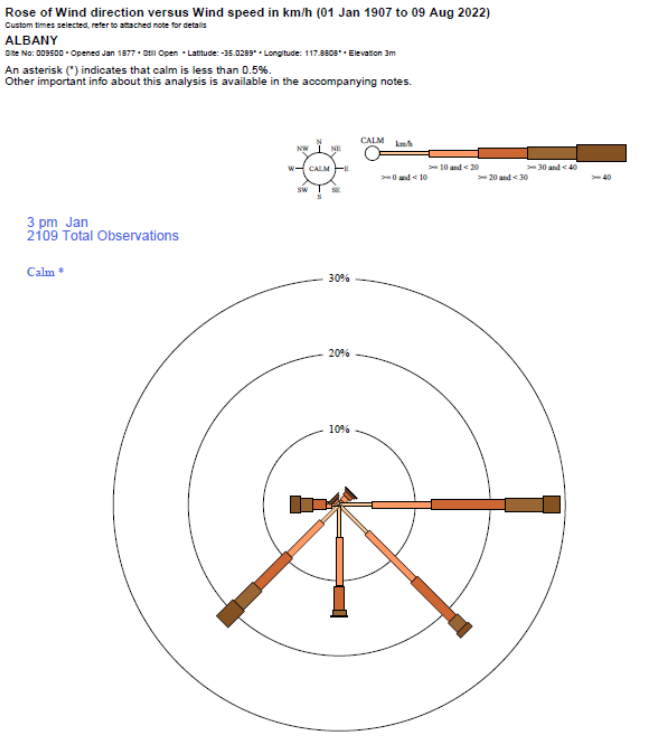


Figure 8: Albany Summer (Jan) 3pm wind rose. (BOM, 2022)

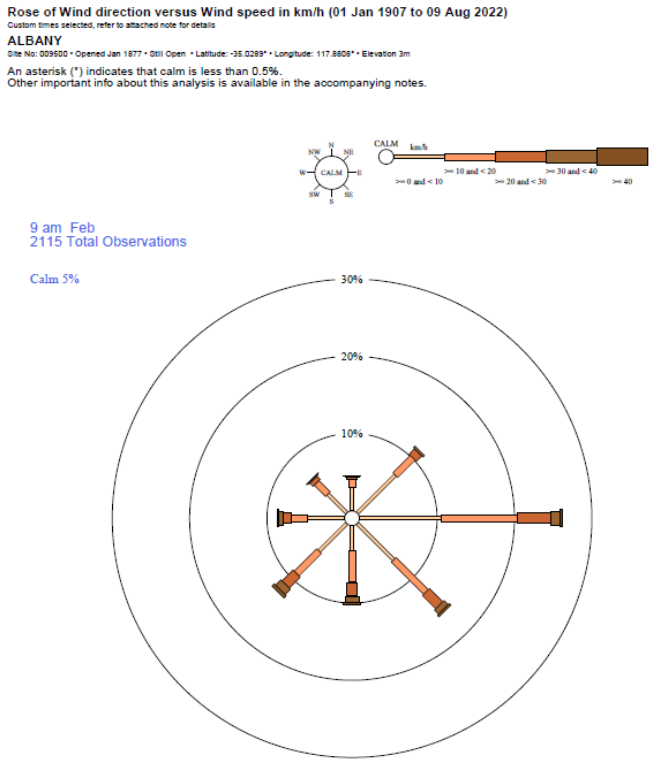


Figure 9: Albany Summer (Feb) 9am wind rose. (BoM, 2022)

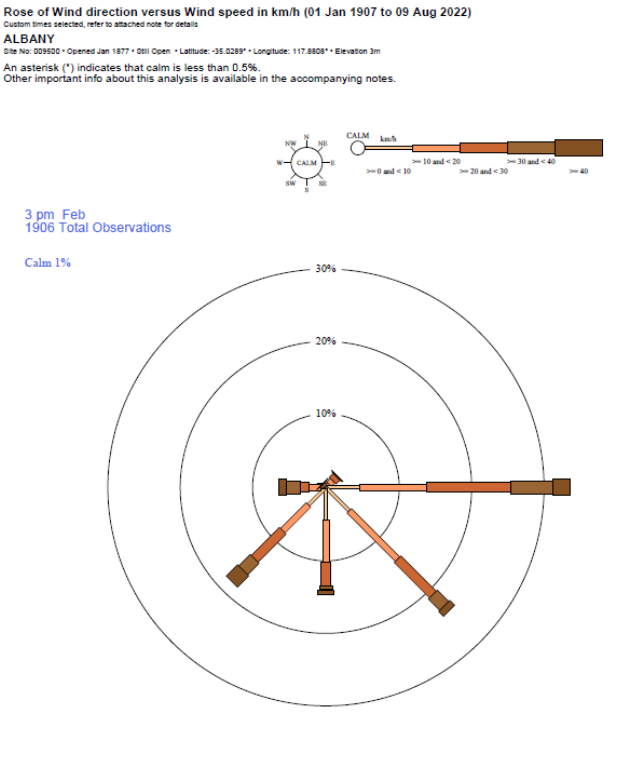


Figure 10: Albany Summer (Feb) 3pm wind rose. (BoM, 2022)

December, January, and February all have the lowest mean 3pm relative humidity recordings on average of 67. Highest curing rates for grasses for the south coast region are on average during January and February (driest periods and lowest relative humidity). Grassland curing refers to the dying or senescence of plant material caused by seasonal weather patterns, species specific phenological cycles and plant succession. Curing has a significant impact on fire behaviour in grasslands, particularly the probability of ignition and the subsequent rate of spread (CRC, 2010). The degree (as a percent) of grassland curing and moisture content are inputs into fire rate of spread models and grassland fire danger ratings.

Fire weather along the south coast region is characterised by mid-level disturbances across the southwest of Western Australia, bringing unstable atmospheric conditions (thunder and lightning) from the north or northwest wind directions. This is characteristic of "Extreme" Fire Weather conditions to the area with hot dry conditions prior to storm events. Risk of lightning strikes, spark ignition, arson and other causes of fire give rise to bushfires under these conditions. Following the unstable conditions, westerly and south westerly fronts across the south coast can bring strong onshore winds.

Prevalent winds which most bushfire events occur in the region are from the northwest, west and northeast direction. Conditions tend to be dry with low relative humidity. High winds and excess fuels can lead to hazardous conditions for residents. Strong easterly and south-westerly winds exist at the subject site during dry summer periods as shown from Albany wind roses in Figure 7-10. The risk of fire from the east onto the subject site (prevalent wind direction) is limited with the lower risk of the Albany urban areas from this direction, also see Section 4.3 Broader Landscape Risk.

4.3 Broader Landscape Risk

Analysis of the broader landscape indicates the subject site is in a predominantly cleared agricultural landscape, the 5km and 10km Bushfire awareness mapping (see Figure 11 over the page) indicates that the bushfire risks on a landscape scale would be from the northwest and west, and south with lesser risks to the east due to the urban areas of Albany. Forest Type A would increase the scale and intensity of bushfire, with Grassland Type G creating fast moving intense fires in the landscape. The coastal areas to the south (along the Southern Ocean) present large areas of coastal health landforms with is dominated by Scrub Type D and Shrubland Type C, these types of fires are also very fast moving in the landscape and have high intensities.

Analysis of the landscape risks outlines the vegetation to the southwest, west and northwest which correspondingly has the highest risk of fire run into the subject site. Forest Type A is classified as Extreme BHL and present extreme risks to the subject site. Modified agricultural landscapes dominated by Grassland Type G exist to the north, northeast, south and east pose a moderate risk of fire run into the subject site.

Generally, rural residential land uses present a moderate bushfire risk when first developed especially when located in previous agricultural areas (grassland dominates which is a Moderate BHL). Over time as properties are developed and planted for amenity, the lot plantings can often increase the bushfire risk. Examples of older subdivisions near recent fire events in 2022 (Denmark and Bridgetown fire events) indicates and underpins the importance of the application of the Section 33 Fire Notices to ensure APZ's are established and maintained around dwellings. The APZ around assets (water tanks) and dwellings is paramount to the ongoing bushfire protection for rural residential areas. It is recommended that planting guides are given to new lot owners indicating more flammable/less flammable planting can assist in the land owner's decision making of the establishment and development of their lot.

Perimeter firebreaks also assist in managing grassland fires, the CoA Fire Management Notice (FMN) outlines the requirement of perimeter firebreaks to 3m required in rural residential and rural lots. Perimeter fire breaks are an important aspect of fire mitigation in these grassland landscapes and is integral to the ongoing fire management for the area post development.

As previously stated, (Section 2 of this report) there is no native vegetation modification proposed at this stage of development. The predominant vegetation modification is the management of grasses in paddock areas and the ongoing management of new planted vegetation which can increase the bushfire risk of the area. It is strongly recommended a planting guide accompanies the BAL contour plan to prospective owners during sales and due diligence stages. Consideration of notification through the scheme amendment/rezoning for the development of the planting guide is recommended. Grasses in rural residential land use areas should be maintained at <100mm at all times. Grazing is recommended to occur on the larger lots to control grasses and bushfire risks. Where grazing cannot be achieved, slashing is recommended on a monthly basis during the fire control period (as established by the CoA Fire Management Notice, December to April inclusive) to control grassland fire risk.

The safer location in the event of bushfire is an early evacuation to the east to the Albany CBD, this is also in the direction of least landscape bushfire risk to the subject site.

Figure 11: 5km and 10km Bushfire awareness mapping

4.4 Access

Currently the subject site is accessed from three public roads being South Coast Highway and Phillliskirk Road to the north and Lowanna Drive to the southeast, providing multiple access routes. Internal to the site, the plan is to construct a series of new public roads and EAW's linking the site to the north and south and providing safe access and egress in two different directions, to two alternative destinations. An EAW of approximately 350m links the development in the south to Old Elleker Road and Lower Denmark Road. Two more EAW's will link the proposed internal access from the northeast to the southwest. The public designated road of Lowanna Drive also links to the greater road network to the east of the subject site to South Coast Highway/Lower Denmark Road. While Phillliskirk Road links to the greater road network to the north of the subject site to South Coast Highway. Both South Coast Highway and Lower Denmark Road are major arterial Main Roads WA managed transport networks which connect to the Albany CBD. New internal linking public roads will establish access to the existing road network and EAW's will link through from the two access roads in the northeast to the access road in the southwest and another EAW will connect the south access road with Old Elleker Road, to greatly improve the access for the area, providing future and existing residents with two-way access while also improving firefighting capabilities. Refer to Figure 12: Access mapping.

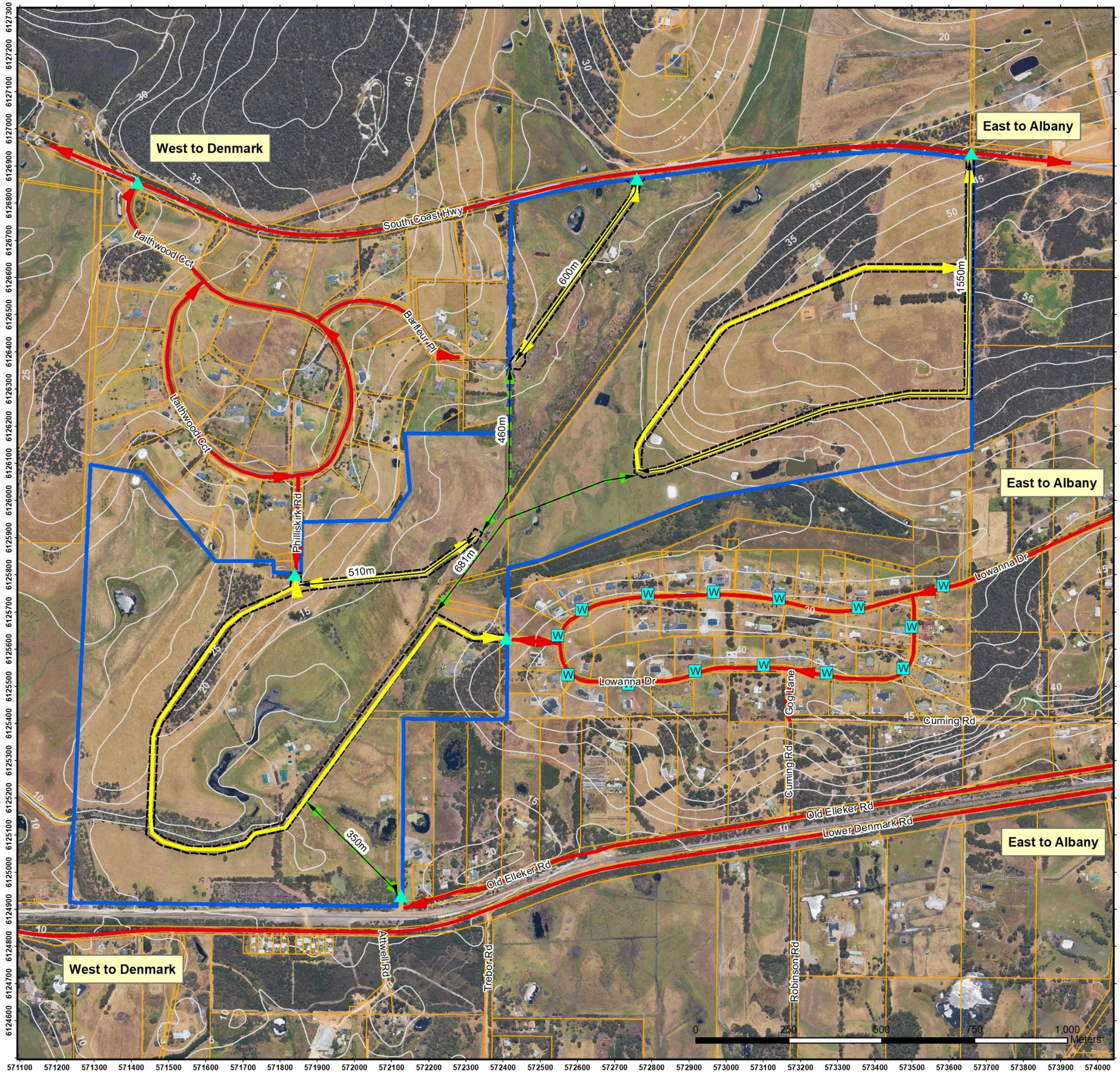
Although two access points onto South Coast Highway is not the most desired outcome for this proposal it presents the safest way to evacuate the site quickly and efficiently from a northwest, west and southwest fire run. The EAW link south to Old Elleker Road allows for an alternative option south if required. The bushfire risk is greater on a north, west and north-westerly bushfire run where the more extreme landscape occurs. Evacuation to the north and east to Albany CBD is recommended away from the bushfire risks.

A cul-de-sac is proposed on Lot 124 (600m) and another on Lot 9001 (510m). An EAW is to link the two cul-de-sacs from Lot 124 (eastern side of Five Mile Creek) to Lot 9001 (measuring 460m). A one loop road is proposed on Lot 125 (Approx. 1550m one way), another EAW is proposed from Lot 125 to lot 9001 (measuring 681m). The third EAW links the southern portion of the proposed new public road to the Old Elleker Road and Lower Denmark Road (measuring 350m). It is noted that the cul-de-sac roads and loop road exceeds the minimum length established by the guidelines (200m). This is due to the environmental constraints in the low-lying areas along Five Mile Creek which cannot be avoided for the larger lots to have access. Additionally, the adjacent rail corridor to the south, the existing road layout surrounding the site and a limited ability to provide additional access points onto South Coast Highway restrict alternative road layouts.

The rezoning plan provides for increased access to existing cul-de-sac roads in the locality vastly increasing access in an emergency and as far as possible, meets compliance with the guidelines by having access in two different directions to two separate destinations. The existing public road network is constructed to the required standards and all new access routes will meet the technical requirements established by the guidelines. All new driveways will be constructed to the minimum technical requirements established by the guidelines and will be actioned in subsequent planning stages (DA and building approval). All EAW's are to have a minimum of 6m wide horizontal trafficable surface, 4.5m wide vertical clearances and easement in gross. All technical standards for access are to be as per the minimum requirements of the guidelines (refer to Figure 13) and with approval from the City of Albany and subdivision stages. The cul-de-sac turnaround area is to be to the technical standards for the cul-de-sac bulb as shown in Figure 14.

4.5 Water Supply

A reticulated water supply is currently not available to the site. The nearest Water Corporation WA (WCWA) standard hydrant is located adjacent to the east along Lowanna Drive. Reticulated water will not be supplied to the development area. Numerous opportunities for strategic water exist within the development. A suitable strategic water source will be designated in consultation with the City of Albany during the subsequent stages of planning. All future landowners will be required to implement a standalone firefighting supply (minimum of 10,000L) for the purposes of firefighting water supply. Also refer to additional information in Section 5.2.4 of this report.



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Esperance, WA 6450
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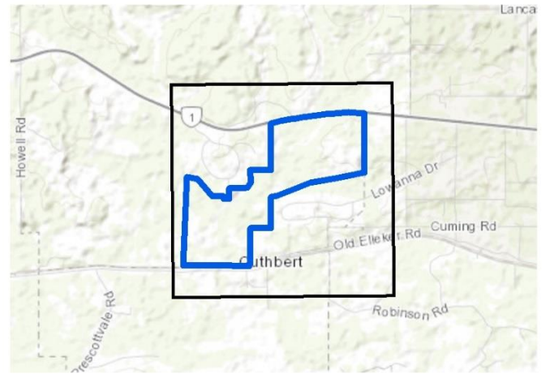
BPAD Bushfire Planning & Design

BIO DIVERSE SOLUTIONS



Overview Map Scale 1:100,000

Legend

- Subject Site
- Cadastre
- 5m Contours
- Road Layout
- Existing Access Routes
- Proposed Access Route
- Proposed EAW (Easement in Gross)
- Distance
- Access Points
- Water Point

Scale
1:10,000 @ A3
GDA MGA 2020 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2022
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Harley Dykstra & Barry Panizza
Lot 124 No 47951 & 125 No 47917 South Coast Highway
& Lot 9001 No 688 Lower Denmark Road Marbelup Cuthbert
Cuthbert WA 6330

Figure 12: Access Map

BAL Assessor	*QA Check*	*Drawn by*
JRB	MKG	GSK
STATUS	*FILE*	*DATE*
FINAL	HD063-007	01/05/2024

5 Assessment against the Bushfire Protection Criteria

5.1 Compliance Table

The Guidelines for Planning in Bushfire Prone Areas (WAPC, 2021) outlines bushfire protection criteria which subdivision and development proposals are assessed for compliance. The bushfire protection criteria (Appendix 4; WAPC, 2021) are performance-based criteria utilised to assess bushfire risk management measures, outlining four elements, being:

- Element 1: Location;
- Element 2: Siting and Design of Development;
- Element 3: Vehicle Access; and
- Element 4: Water.

The subject site has been assessed and are required to meet the "Acceptable Solutions" of each element of the bushfire mitigation measures (WAPC, 2021). The proposal has been assessed against all elements of the bushfire protection criteria and found to be compliant, refer to Table 5.

Table 5: Bushfire protection criteria applicable to the subject site

Element	Acceptable Solution	Applicable or not Yes/No	Proposal meets Acceptable Solution
Element 1 – Location	A1.1 Development Location	Yes	Compliant As per SPP.3.7 and the Guidelines for Planning in Bushfire Prone Areas, the rezoning area and subsequent subdivision development will not be subject to a higher BHL than moderate. All new residential buildings can be located within a "Moderate" BHL area. A BAL contour map will be completed at the subdivision stage, the large rural residential lots and the moderate BHL prevailing over most of the application area should allow for BAL-29 or less to be achieved. Appropriate setbacks from all areas of vegetation will ensure BAL-29 can be achieved for all lots. For required setbacks from classified vegetation, refer to Table 4: Separation Distances to achieve BAL-29 from each Vegetation Plot (BAL-29 APZ). Proposal meets Acceptable Solution A1.1.
Element 2 – Siting and Design	A2.1 Asset Protection Zone (APZ)	Yes	Compliant The majority of the site is subject to a moderate BHL, see Figure 6: BHL Map (Pre and Post Development). The future rural development will allow for BAL-29 APZ's to be implemented on all lots. There are small patches and thin strips of remnant forest vegetation within the development area. Appropriate setbacks from all areas of vegetation will ensure BAL-29 can be achieved for all lots. For required setbacks from classified vegetation, refer to Table 4: Separation Distances to achieve BAL-29 from each Vegetation Plot (BAL-29 APZ). In the future, all APZ's will be maintained to the required standards set out in the guidelines, see Appendix C: Schedule - 1 WAPC Asset Protection Zone (APZ) standards. If the subsequent subdivision is staged, the developer is to maintain the balance of land in ownership in accordance with the CoA Fire Management Notice and the WAPC APZ standards. Any landscaping, replanting for buffers, screening or enhancement of the site is to conform to WAPC APZ requirements and should be reviewed by the bushfire practitioner prior to approval from the Local Government to meet low fuel requirements or to ensure it does not increase the bushfire threat. Proposal meets Acceptable Solution A2.1.
Element 3 – Vehicular Access	A3.1 Public Roads	Yes	Compliant The existing and proposed public roads are or will be constructed to the minimum technical standards as required by the guidelines, refer to Figure 13: Access Technical Requirements. All public roads are to meet the relevant trafficable (carriageway/pavement) width as defined/established by CoA. Internal roads currently indicate they will have a minimum 15-20m wide road reserve (subject to detailed engineering design). Public road designs are to be approved at subdivision approval stages by the CoA. Proposal meets Acceptable Solution A3.1.

Table 5 cont.

Element	Acceptable Solution	Applicable or Not Yes/No	Proposal meets Acceptable Solution
Element 3 – Vehicular Access cont.	A3.2a Multiple Access Routes	Yes	Compliant Currently the subject site is accessed via three public roads being Lowanna Drive to the southeast, Phillliskirk Road to the north (onto South Coast Highway) and via two new roads from the site onto South Coast Highway. The new access road in Lot 9001 will connect Lowanna Drive with Phillliskirk Road which provides an alternative route for the existing areas. The major arterial roads of South Coast Highway and Lower Denmark Road provide access which connects to the Albany CBD or Denmark town centre. EAW's will connect all proposed new roads which will provide two-way access to the development area north and south connecting both lots 124 and 125 to Lot 9001. One EAW will connect the southern portion of the proposed access in Lot 9001 to the western end to Old Elleker Road and Lower Denmark Road. As sealed public roads and publicly accessible EAW's (easements in gross), they will be available to all residents and the public at all times and under all weather conditions. Refer to Figure 12: Access Map. All surrounding roads are currently loop roads, linking Lowanna Drive and Phillliskirk Road will provide an alternative access option for this site and the surrounding area. The rezoning plan provides for increased access to existing cul-de-sac in the locality vastly increasing access in an emergency. Proposal meets Acceptable Solution A3.2a.
	A3.2b Emergency Access Ways	Yes	One of the EAW's is Non-Compliant Three EAW's are proposed as part of this proposal. Two will link Lot 124 and 125 to Lot 9001, measuring 460m and 681m respectively and one to the south to Old Elleker Road, measuring 350m. Multiple access options were considered however due to the environmental constraints in the low-lying areas along Five Mile Creek which cannot be avoided for the larger lots to have access. Additionally, the adjacent rail corridor to the south, the existing road layout surrounding the site, a limited ability to provide additional access points onto South Coast Highway, the existing lot layout to the west and the South Down Slurry easement to the east, further public road designation could not be achieved. These EAW's will create two-way access for the local area and will meet the technical requirements established by the guidelines, see Figure 13: Access Technical Requirements. Proposal does not meet the Acceptable Solution A3.2b on one EAW.
	A3.3 Through Roads	Yes	Compliant Compliance with this element is reliant on the proposed new access being approved and constructed. A cul-de-sac is proposed on Lot 124 (600m) and another on Lot 9001 (510m). An EAW is to link the two cul-de-sacs from Lot 124 (eastern side of Five Mile Creek) to Lot 9001 (measuring 460m). A one loop road is proposed on Lot 125 (Approx. 1550m one way), another EAW is proposed from Lot 125 to lot 9001 (measuring 681m). The third EAW links the southern portion of the proposed new public road to the Old Elleker Road and Lower Denmark Road (measuring 350m). It is noted that the cul-de-sac roads and loop road exceeds the minimum length established by the guidelines (200m) this is due to the environmental constraints on the low-lying areas along Five Mile Creek, the adjacent rail corridor, and the existing surrounding road layout which cannot be avoided for the larger lots to have access. The cul-de-sacs will have a complaint turn around area and be constructed to the minimum technical requirements established by the guidelines see Figure 13: Access Technical Requirements and Figure 14: Complaint Turn Around Areas. Upon construction proposal can meet the Acceptable Solution A3.3.

Table 5 cont.

Element	Acceptable Solution	Applicable or Not Yes/No	Proposal meets Acceptable Solution
Element 3 – Vehicular Access cont.	A3.4a Perimeter roads	No	The lots are rural residential and rural small holdings, lots ranging from 1ha to 8.50ha, perimeter roads are not required for rural residential zoning or lots in Grassland Type G. Not assessed to A3.4b.
	A3.4b Fire Service Access Route	No	A Fire Service Access Route is not required as the public road networks will be utilised. Where Forest Type A Vegetation occurs on lots access to the lots will be via the public road network and established driveways. Not assessed to A3.4b.
	A3.5 Battle axe access legs	No	Not addressed at this stage of planning, to be actioned in subsequent planning stages. Not assessed to A3.5.
	A3.6 Private driveways	No	Not addressed at this stage of planning, to be actioned in subsequent planning stages (DA and building approval). Not assessed to A3.6.
Element 4 – Water	A4.1 Identification of future water supply	Yes	Compliant in future stages A reticulated water supply is currently not available to the site. The nearest Water Corporation WA (WCWA) standard hydrant is located adjacent to the east along Lowanna Drive. Reticulated water will not be supplied to the subdivision. Numerous opportunities for strategic water exist in the development. A suitable strategic water source will be designated in consultation with the City of Albany during the subsequent stages of planning. All future landowners will be required to implement a standalone firefighting supply (minimum of 10,000L) for the purposes of firefighting water supply. Also refer to additional information in Section 5.2.4 of this report. Proposal meets Acceptable Solution A4.1.
	A4.2 Provision of water for firefighting supply	Yes	Not addressed at this stage of planning, to be actioned in subsequent planning stages. Not assessed to A4.2.

5.2 Other Bushfire Mitigation Measures

Refer to section 5.1 access standards.

New public roads will meet the technical requirements established by the guidelines. The proposed new access will be constructed to the standards stated in the Figure 13 below.

TECHNICAL REQUIREMENTS	1 Public roads	2 Emergency access way[1]	3 Fire service access route[1]	4 Battle-axe and private driveways[2]
Minimum trafficable surface (metres)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (metres)	N/A	6	6	6
Minimum vertical clearance (metres)	4.5			
Minimum weight capacity (tonnes)	15			
Maximum grade unsealed road[3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum grade sealed road[3]		1:7 (14.3%)		
Maximum average grade sealed road		1:10 (10%)		
Minimum inner radius of road curves (metres)		8.5		

Notes:

[1] To have crossfalls between 3 and 6%.

[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

[3] Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Figure 13: Access Technical Requirements

The dimensions for a turn-around area on a no through road are indicated below in the Figure 14 below.

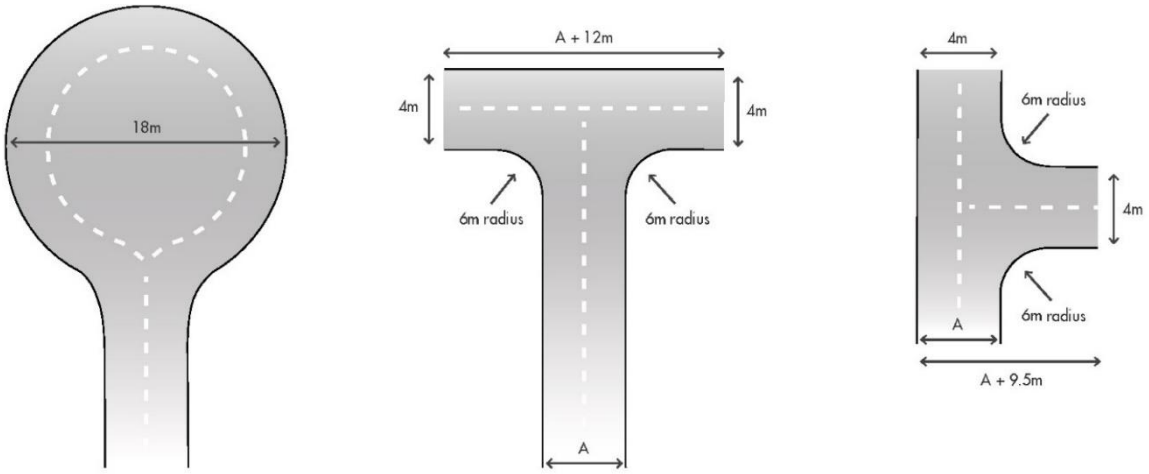


Figure 14: Turn-around Area Technical Requirements

6 Implementation Actions

The responsibilities of the developer(s), landowners and local government are shown in Table 6, 7 and 8.

6.1 Future lot owner's responsibility

It is recommended the future property owners shall be responsible for the following:

Table 6: Implementation actions, future lot owners

Future Lot owner				
No	**Implementation Action**	**Initial**	**Annual**	**All times**
1	Build to AS3959-2018 as it applies to their property and provide a certified BAL to their proposed building at building approval stages.	✓		
2	Establish/maintain APZ's and low fuel areas to the standard and extent stated in this BMP and/or their allocated certified BAL, see Schedule 1 Standards for APZ's.	✓		✓
3	Maintain individual lots fire breaks and bushfire fuel load in accordance with this BMP and the current CoA Fire Management Notice.		✓	
4	A driveway cross over to be designated/ installed for access into the lots to the minimum technical standards as required by current and endorsed WAPC guidelines. To be demonstrated to CoA at planning approval/building approval stages.	✓		✓
5	Ensure a minimum 10,000 litre standalone water tank is installed for strategic firefighting purposes. To be demonstrated to CoA at planning approval/building approval stages.	✓		

6.2 Developer's responsibility

It is recommended the developer be responsible for the following:

Table 7: Implementation actions, current land owner/developer

Developer		
No	**Implementation Action**	**Entity Responsible**
1	Planning approval may be conditioned with the requirement to make appropriate notifications (on the certificates of title and the deposited plan), of the existence of this Bushfire Management Plan and that the land is within a designated bushfire prone area. A Notification, pursuant to Section 165 of the Planning and Development Act 2005 may be required to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factors. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows: 'This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is subject to a Bushfire Management Plan. Additional planning and building requirements apply to development on this land'.	**Developer**
2	Ensure a BMP/BAL contour plan is prepared to support the WAPC subdivision application at the subdivision stage. Individual BMPs over the rezoning plans may be developed in subsequent planning stages and if the lots are subdivided at differing times.	**Developer**
3	Continue to manage lots in ownership as per the current CoA Fire Management Notice and the requirements within this BMP until lots are sold and titles relinquished.	**Landowner**
4	Ensure in the future that prospective buyers are aware of the BAL Contour Plan and the applicable BAL to their property through provision of BAL Contour Plan. Update the BAL contour plan and provide certification of BAL Contour prior to lodgement of titles (post construction).	**Developer**
5	Ensure lots are compliant with the relevant local government's annual firebreak notice issued under s33 of the Bushfires Act 1954.	**Developer**
6	Ensure public roads are constructed to the required standards, all public roads approved by the City of Albany at subdivision approval stages.	**Developer and civil engineer**
7	Ensure the Emergency Access Way is ceded as an easement in favour and constructed to the standards stated in Figure 13: Access Technical Requirements.	**Developer and civil engineer**
8	The cul-de-sacs will have a complaint turn around area and be constructed to the minimum technical requirements established by the guidelines see Figure 13: Access Technical Requirements and Figure 14: Complaint Turn Around Areas. The vehicular access standards should be documented in civil engineering drawings for construction and implemented at subdivision construction stages. To be approved by the CoA.	**Developer and civil engineer**
9	Ensure strategic water is designated through the subsequent stages in consultation with the City of Albany. Implementation of strategic water supply will be at the cost of the developer and implemented prior to subdivision clearance/issue of titles.	**Developer and civil engineer**
10	A localised planting guide accompanies the BAL contour plan to prospective owners during sales and due diligence stages.	**N/A recommended not mandatory**

6.3 Local Government Responsibility

It is recommended the local government be responsible for the following:

Table 8: Implementation actions, City of Albany

CoA		
No	**Implementation Action**	**Stage of Approval**
1	Request for the update of the BAL contour plan and certification of BAL Contour prior to clearance of titles (post construction).	**WAPC Subdivision Stage**
2	Request BAL certification at Building Approval stages on any proposed habitable buildings. Buildings to be located in BAL-29, BAL-19 and BAL-12.5 zones. Increased construction standards to BAL and AS3959-2018 applies to buildings located in the WA bushfire Prone Area Mapping (OBRM, 2021).	**Development and Building Approval**
3	Ensure vehicle access standards are achieved as per Figure 13 and 14.	**WAPC Subdivision Stage**
4	Ensure a minimum 10,000 litre standalone water tank is installed for strategic firefighting purposes on each lot. To be demonstrated to CoA at planning approval/building approval stages.	**Development Approval**
5	Ensure all buildings and their respective driveways conform at DA stages to the current and endorsed WAPC guidelines technical standards which apply to driveway construction.	**Development Approval**
6	Monitor landowner compliance with the Bushfire Management Plan and the annual CoA Fire Management Notice.	**Ongoing**
7	Ensure that if the Emergency Access Way is gated, that it always remains unlocked.	**Ongoing**
8	If agreed to by CoA, ensure strategic water is suppled in accordance with the WAPC guidelines and available to emergency services. Maintenance of the strategic water supply will be the responsibility of the CoA.	**Subsequent planning stages**

7 Disclaimer

The recommendations and measures contained in this assessment report are based on the information available at the time of writing following the instructions of the regulatory authorities and following the requirements of the Australian Standards 3959-2018 – Building in Bushfire Prone Areas, WAPC State Planning Policy 3.7 (WAPC, 2015), WAPC Guidelines for Planning in Bushfire Prone Areas version 1.4 (WAPC, 2021), and applying best practise as described by Fire Protection Association Australia. These are considered the minimum standards required to balance the protection of the dwellings and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire, people injured, or fatalities occur either at the site or while evacuating. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed development are made in good faith on the basis of the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the bushfire consultant has no control. Notwithstanding anything contained within, the consultant/s will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the bushfire consultant) arising out of the services rendered by the consultant.

AS3959-2018 disclaimer: It should be borne in mind that the measures contained within this Standard (AS3959-2018) cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather condition.

Building to AS3959-2018 is a standard primarily concerned with improving the ability of buildings in designated bushfire prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes) as well as to the building itself (AS3959, 2018).

8 Certification

I hereby certify that I have undertaken the assessment of the above site and determined the Bushfire Attack Level (s) stated in this document have been prepared in accordance with the requirements of AS3959-2018 and the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2021).

SIGNED, ASSESSOR: ..... DATE: 1/05/2024

Jason Benson, Bio Diverse Solutions

Accredited Level 2 Bushfire Practitioner (Accreditation No: BPAD-37893)

9 Revision Record

Revision	Prepared By	Summary	Reviewed By	Date
Draft Id	Jason Benson	Internal QA Review	Michelle Gray	29/04/2024
Draft Id	Jason Benson	Internal Technical Review	Kathryn Kinnear	29/04/2024
Final Id	Jason Benson	Issued to Client		1/05/2024

10 References

AS3959-2018 Australian Standard, *Construction of buildings in bushfire-prone areas*, Building Code of Australia, Primary Referenced Standard, Australian Building Codes Board and Standards Australia.

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11 Appendices

Appendix A: Original Vegetation Classifications to AS3959 (North)

Appendix B: Original Vegetation Classifications to AS3959 (South)

Appendix C: Schedule 1 - WAPC Asset Protection Zone (APZ) standards to apply

Appendix A

Original Vegetation Classifications to AS3959 (North)

Vegetation classification to AS3959-2018

Site Details			
Address:	Lot 124 (No. 47951) & Lot 125 (No. 47917) South Coast Highway		
Suburb:	Marbelup	**State:**	W.A.
Local Government Area:	City of Albany		
Stage of WAPC Planning	Rezoning		

BMP Plan Details			
Report / Job Number:	HD063-003	**Report Version:**	Final
Assessment Date:	19 October 2021	**Report Date:**	7 December 2022
BPAD Practitioner	Jason Benson	**Accreditation No.**	BPAD 37893

Vegetation Classification

Site assessment occurred on the 19th October 2021 by Jason Benson (BPAD 37893) site conditions were verified by Kathryn Kinnear in 2022. All vegetation within 150m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified in the following pages and shown Table 1 and on the Vegetation, Classes Maps Page 2 and 3.

Table 1: Vegetation Classification Table (in accordance with AS 3959-2018) of the subject site

Plot number	Vegetation Type (Table 2.3)	Slope (Table 2.4.3)
1	Excluded 2.2.3.2 (e)	N/A
2	Excluded 2.2.3.2 (f)	N/A
3	Grassland Type G	Upslope/flat
4	Grassland Type G	Downslope >0-5 degrees
5	Grassland Type G	Downslope >5-10 degrees
6	Forest Type A	Upslope/flat
7	Forest Type A	Downslope >0-5 degrees
8	Forest Type A	Downslope >5-10 degrees
9	Scrub Type D	Upslope/flat
10	Scrub Type D	Downslope >0-5 degrees
11	Forest Type A	Upslope/flat
12	Forest Type A	Upslope/flat
13	Shrubland Type C	Downslope >0-5 degrees

Plot Number	Vegetation Type	Slope
1	Excluded 2.2.3.2 (e)	N/A
2	Excluded 2.2.3.2 (f)	N/A
3	Grassland Type G	Upslope/flat
4	Grassland Type G	Downslope >0-5 degrees
5	Grassland Type G	Downslope >5-10 degrees
6	Forest Type A	Upslope/flat
7	Forest Type A	Downslope >0-5 degrees
8	Forest Type A	Downslope >5-10 degrees
9	Scrub Type D	Upslope/flat
10	Scrub Type D	Downslope >0-5 degrees
11	Forest Type A	Upslope/flat
12	Forest Type A	Upslope/flat
13	Shrubland Type C	Downslope >0-5 degrees

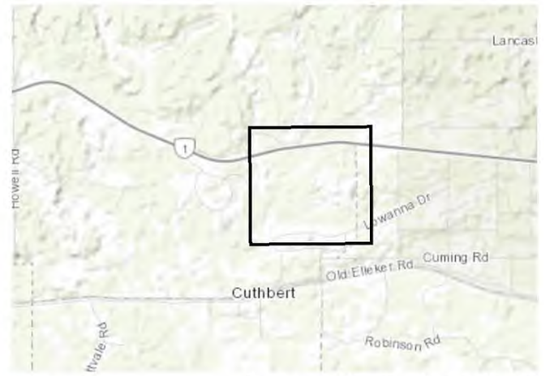
Albany Office:
29 Hercules Crescent
Albany, WA 6330
(08) 9842 1575

Denmark Office:
7/40 South Coast Highway
Denmark, WA 6333
(08) 9848 1309

Esperance Office:
2A/113 Dempster Street
Esperance, WA 6450
(08) 9072 1382

BPAD Bushfire Planning & Design
Accredited Practitioner Level 2

BIO DIVERSE SOLUTIONS



Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 5m Contours
- Slopes Degrees
- Photo Point
- Vegetation/Plot Boundary

Vegetation

- Forest Type A
- Shrubland Type C
- Scrub Type D
- Grassland Type G
- Low fuel or non vegetated 2.2.3.2

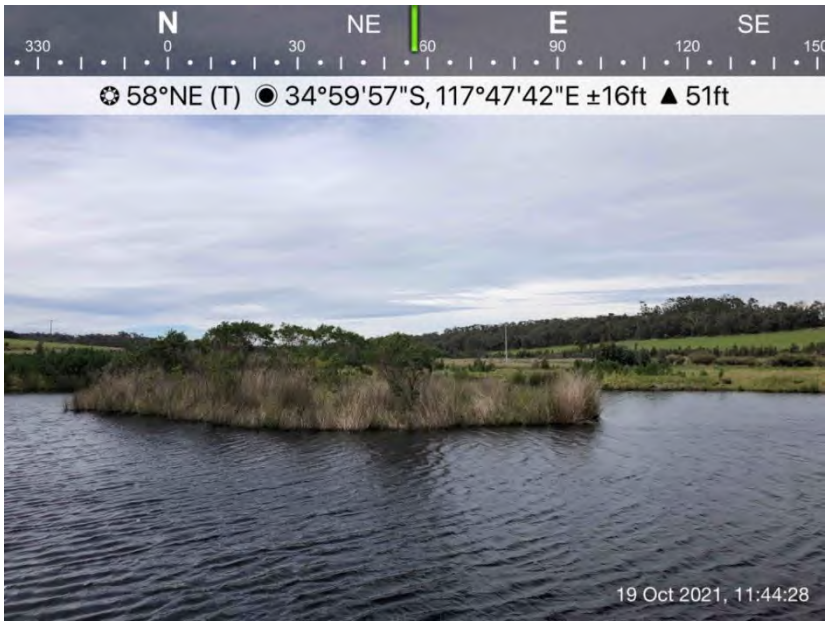
Scale
1:5,500 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Harley Dykstra
Lot 124 (No. 47951) South Coast Highway
Cuthbert, WA 6330

Vegetation Classes - NORTH

BAL Assessor	QA Check	Drawn by
JRB	MLH	GSK
STATUS	**FILE**	**DATE**
FINAL	HD063-003	13/12/2022

Plot	1	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (e)
			**Location:** Internal to the subject site in the north and south and external in the north. **Description:** Roads, driveways, buildings, dams and other non-vegetated areas. As per exclusion clause 2.2.3.2 (e) of AS3959-2018.
Photo Id 1: View facing west along South Coast Highway, located to the north of the subject site.			
Plot	**1 cont.**	**Classification or Exclusion Clause**	**Low fuel or non-vegetated areas exclusion 2.2.3.2 (e)**
			**Additional Photo of Plot 1.**
Photo Id 2: View facing northeast towards a dam, located near the northwest corner of the subject site.			

Plot	1 cont.	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (e)
			**Additional Photo of Plot 1.**
Photo Id 3: View facing west-southwest towards a dam, located near the southern boundary of the subject site.			
Plot	**2**	**Classification or Exclusion Clause**	**Low fuel or non-vegetated areas exclusion 2.2.3.2 (f)**
			**Location:** Central to the subject site surrounding existing house and shed. External in the southeast, south and west. **Description:** Maintained gardens and lawns in Asset Protection Zone (APZ) areas surrounding existing buildings and managed firebreaks. Excluded as per AS3959 exclusion clause 2.2.3.2 (f). **Available fuel loading:** <2 t/ha.
Photo Id 4: View facing southeast towards low threat area surrounding existing shed, located central east in the subject site.			

Plot	2 cont.	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (f)
			**Additional Photo of Plot 2.**

Photo Id 5: View facing north towards APZ area surrounding existing house, located centrally east within the subject site.

Plot	2 cont.	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (f)
			**Additional Photo of Plot 2.**

Photo Id 6: View facing southwest towards low threat area, located central east in the subject site.

Plot	2 cont.	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (f)
			**Additional Photo of Plot 2.**
Photo Id 7: View facing east-northeast towards low threat area, located adjacent to the southeast corner of the subject site.			
Plot	**2 cont.**	**Classification or Exclusion Clause**	**Low fuel or non-vegetated areas exclusion 2.2.3.2 (f)**
			**Additional Photo of Plot 2.**
Photo Id 8: View facing east towards low threat area on vacant lots, located adjacent to the southwest corner of the subject site.			

Plot	3	Classification or Exclusion Clause	Grassland Type G

Location: North, south and west of the subject site.

Separation Distance: 0m.

Description: Mixed unmanaged grasses, sedges and weeds in paddock area. Some trees present, less than 10% canopy cover noted.

Average vegetation height: 50-500mm.

Vegetation Coverage: <10% Trees.

Available fuel loading: 4.5t/ha.

Effective slope: Upslope/flat.

Photo Id 9. View facing west towards grassland vegetation, located to the west of the subject site.

Plot	3 cont.	Classification or Exclusion Clause	Grassland Type G

Additional Photo of Plot 3.

Photo Id 10: View facing west towards grassland vegetation, located to the west of the subject site.

Plot	3 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 3.**

Photo Id 11: View facing north towards grassland vegetation, located to the north of the subject site.

Plot	3 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 3.**

Photo Id 12: View facing south-southwest towards grassland vegetation, located to the north of the subject site.

Plot	4	Classification or Exclusion Clause	Grassland Type G
			**Location:** Internal and external to the subject site in the north, south and west of the subject site. **Separation Distance:** 0m. **Description:** Mixed unmanaged grasses, sedges and weeds in paddock area. Some trees present, less than 10% canopy cover noted. **Average vegetation height:** 50-500mm. **Vegetation Coverage:** <10% Trees. **Available fuel loading:** 4.5t/ha. **Effective slope:** Downslope >0-5 degrees.

Photo Id 13: View facing west towards grassland vegetation, located central south in the subject site.

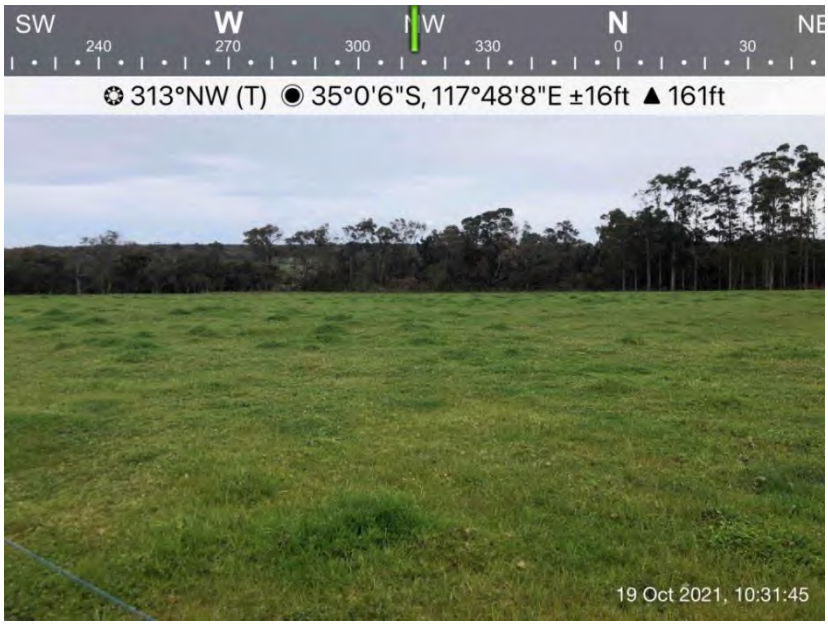
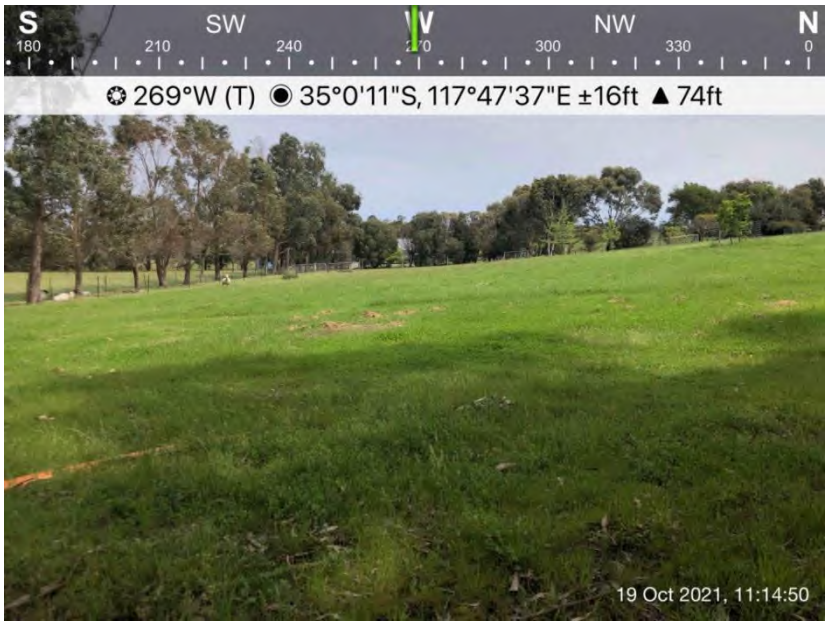
Plot	4 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 4.**

Photo Id 14: View facing northwest towards grassland vegetation, located central to the subject site.

Plot	4 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 4.**
Photo Id 15: View facing north towards grassland vegetation, located central west in the subject site.			

Plot	4 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 4.**
Photo Id 16: View facing west towards grassland vegetation, located to the west of the subject site.			

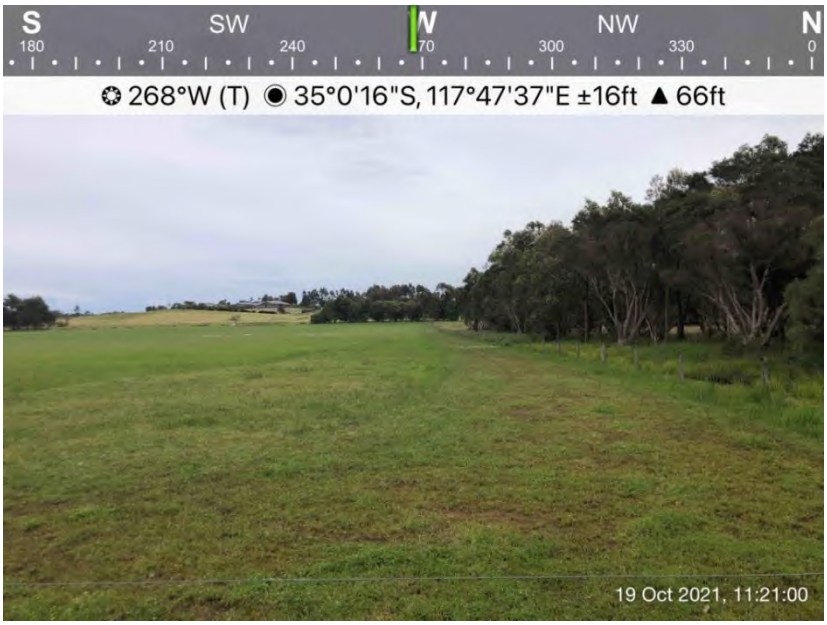
Plot	4 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 4.**

Photo Id 17: View facing west towards grassland vegetation, located to the west of the subject site.

Plot	4 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 4.**

Photo Id 18: View facing west towards grassland vegetation, located to the near the eastern boundary of the subject site.

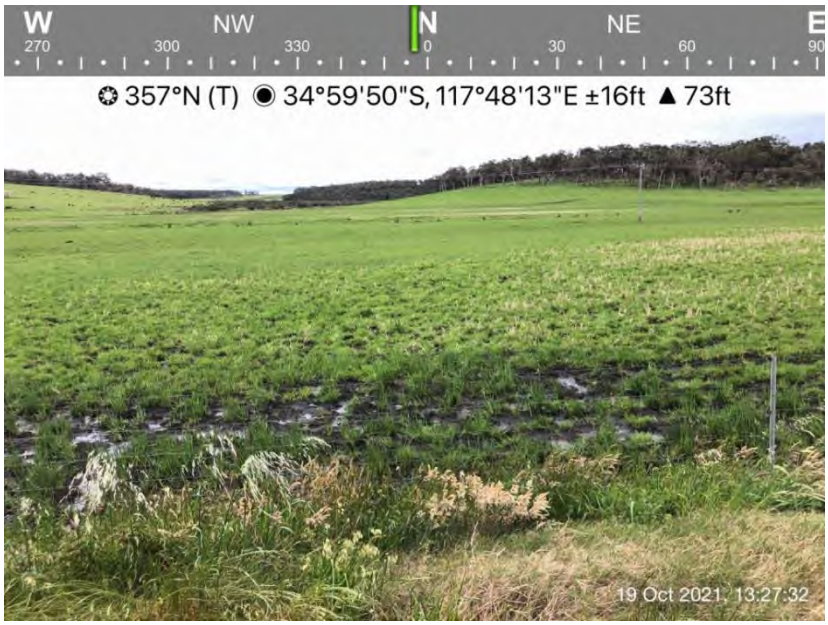
Plot	4 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 4.**

Photo Id 19: View facing north towards grassland vegetation, located to the north of the subject site.

Plot	5	Classification or Exclusion Clause	Grassland Type G
			**Location:** Internal to the subject site in the northeast, central and southeast and external to the northeast. **Separation Distance:** 0m. **Description:** Mixed unmanaged grasses, sedges and weeds in paddock area. Some trees present, less than 10% canopy cover noted. **Average vegetation height:** 50-500mm. **Vegetation Coverage:** <10% Trees. **Available fuel loading:** 4.5t/ha. **Effective slope:** Downslope >5-10 degrees.

Photo Id 20: View facing north-northeast towards grassland vegetation, located central north in the subject site.

Plot	5 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 5.**

Photo Id 21: View facing south-southeast towards grassland vegetation, located central northeast in the subject site.

Plot	5 cont.	Classification or Exclusion Clause	Grassland Type G
			**Additional Photo of Plot 5.**

Photo Id 22: View facing east-northeast towards grassland vegetation, located to the northeast of the subject site.

Plot	6	Classification or Exclusion Clause	Forest Type A
			**Location:** Internal to the subject site in the northwest and west. External in the north, east and west. **Separation Distance:** 0m. **Description:** Forest vegetation consisting Warren River Cedar and mixed native and non-native Eucalyptus Trees. Dense canopy cover with multilayered scrub mid/understorey of Acacia, Hibbertia, Taylorina, Banksia, sedges and rushes. **Average vegetation height:** 10-20m. **Vegetation Coverage:** 30-70% foliage cover. **Available fuel loading**: 25-35t/ha. **Effective slope:** Upslope/flat.

Photo Id 23: View facing south towards thin strip of forest vegetation, located on the western boundary of the subject site.

Plot	6 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 6.**

Photo Id 24: View facing northwest towards forest vegetation, located to the north of the subject site.

Plot	6 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 6.**
Photo Id 25: View facing east towards forest vegetation, located to the east of the subject site.			
Plot	**7**	**Classification or Exclusion Clause**	**Forest Type A**
			**Location:** Internal and external to the subject site in the north, east, south and west. **Separation Distance:** 0m. **Description:** Forest vegetation consisting Warren River Cedar and mixed Eucalyptus Trees. Dense canopy cover with multilayered scrub mid/understorey of Acacia, Hibbertia, Taylorina, Banksia, sedges and rushes. Some areas consist of trees that have been removed and have resprouted. Precautionary principle has been applied. **Average vegetation height:** 8-18m. **Vegetation Coverage:** 30-70% foliage cover. **Available fuel loading**: 25-35t/ha. **Effective slope:** Downslope >0-5 degrees.
Photo Id 26: View facing north towards thin strip of forest vegetation, located central within the subject site in creek line.			

Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.** *Note: Planted rows of Eucalypt trees, can be modified to a low threat state.*

Photo Id 27: View facing west towards rows of planted Eucalyptus trees adjacent to driveway, located central east in the subject site.

Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.** *Note: Trees in this area have been removed and resprouted, it is expected that at maturity this vegetation will return to Forest Type A. Precautionary principle has been applied.*

Photo Id 28: View facing south towards forest vegetation, located central west in the subject site.

Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.**

Photo Id 29: View facing north towards forest vegetation, located near the western boundary of the subject site.

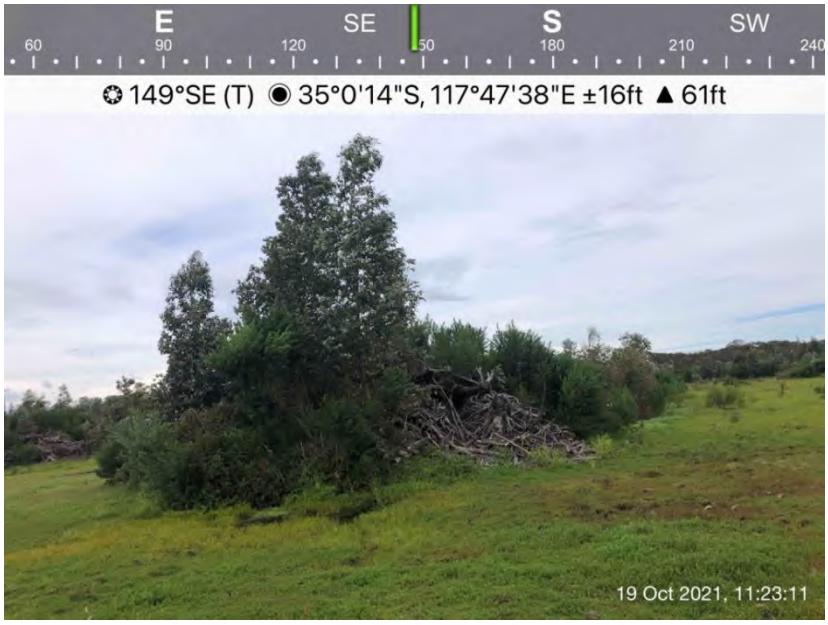
Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.** *Note: Trees in this area have been removed and resprouted, it is expected that at maturity this vegetation will return to Forest Type A. Precautionary principle has been applied.*

Photo Id 30: View facing south-southeast towards forest vegetation, located central west in the subject site.

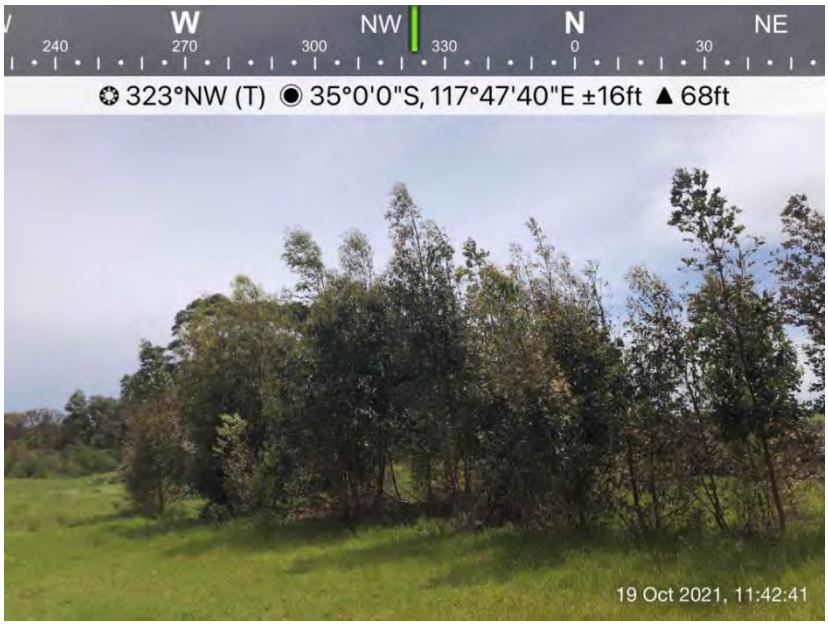
Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.** *Note: Trees in this area have been removed and resprouted, it is expected that at maturity this vegetation will return to Forest Type A. Precautionary principle has been applied.*

Photo Id 31: View facing northwest towards small patch of forest vegetation, located near the northwest corner in the subject site.

Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.**

Photo Id 32: View facing north-northwest towards thin strip of forest vegetation, located adjacent to south Coast Highway to the north of the subject site.

Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.**
Photo Id 33: View facing west towards small patch of forest vegetation, located near the southern boundary of the subject site.			
Plot	**7 cont.**	**Classification or Exclusion Clause**	**Forest Type A**
			**Additional Photo of Plot 7.**
Photo Id 34: View facing east towards forest vegetation, located to the south eastern of the subject site.			

Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.** *Note: Photo 35 show native forest vegetation to the left of the photo and rows of planted Eucalyptus trees to the right of the photo.*

Photo Id 35: View facing south towards forest vegetation, located to the northeast corner of the subject site.

Plot	7 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 7.**

Photo Id 36: View facing west towards thin strip of forest vegetation, located adjacent to south Coast Highway to the north of the subject site.

Plot	8	Classification or Exclusion Clause	Forest Type A
			**Location:** Internal and external to the subject site in the north and northeast. **Separation Distance:** 0m. **Description:** Forest vegetation consisting Warren River Cedar and mixed native and non-native Eucalyptus Trees. Dense canopy cover with multilayered scrub mid/understorey of Acacia, Hibbertia, Taylorina, Banksia, sedges and rushes. **Average vegetation height:** 8-18m. **Vegetation Coverage:** 30-70% foliage cover. **Available fuel loading**: 25-35t/ha. **Effective slope:** Downslope >5-10 degrees.

Photo Id 37: View facing west-northwest towards forest vegetation, located central northeast in the subject site.

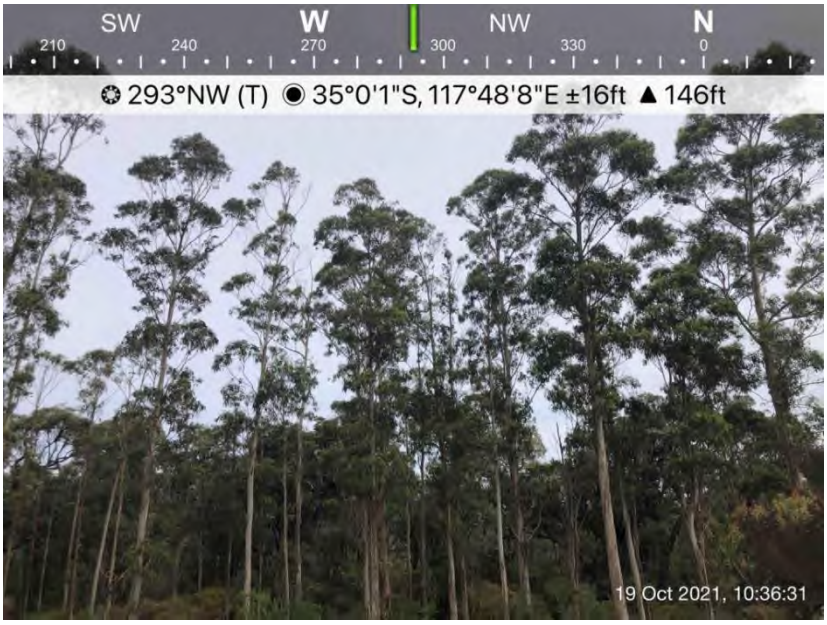
Plot	8 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 8.**

Photo Id 38: View facing west-northwest towards forest vegetation, located central north in the subject site.

Plot	8 cont.	Classification or Exclusion Clause	Forest Type A
			**Additional Photo of Plot 8.**

Photo Id 39: View facing west-southwest towards forest vegetation, located central south in the subject site.

Plot	8 cont.	Classification or Exclusion Clause	Scrub Type D
			**Additional Photo of Plot 8.**

Photo Id 40: View facing northwest towards forest vegetation, located to the northeast of the subject site.

Plot	9	Classification or Exclusion Clause	Scrub Type D
			**Location:** Internal and external to the subject site in the north. **Separation Distance:** 0m. **Description:** Scrub vegetation consisting of Taylorina, grasses, sedges and rushes. **Average vegetation height:** 2-4m. **Vegetation Coverage:** >10-30% foliage cover. **Available fuel loading**: 25t/ha. **Effective slope:** Upslope/flat.

Photo Id 41: View facing northeast towards scrub vegetation, located on the northern boundary of the subject site.

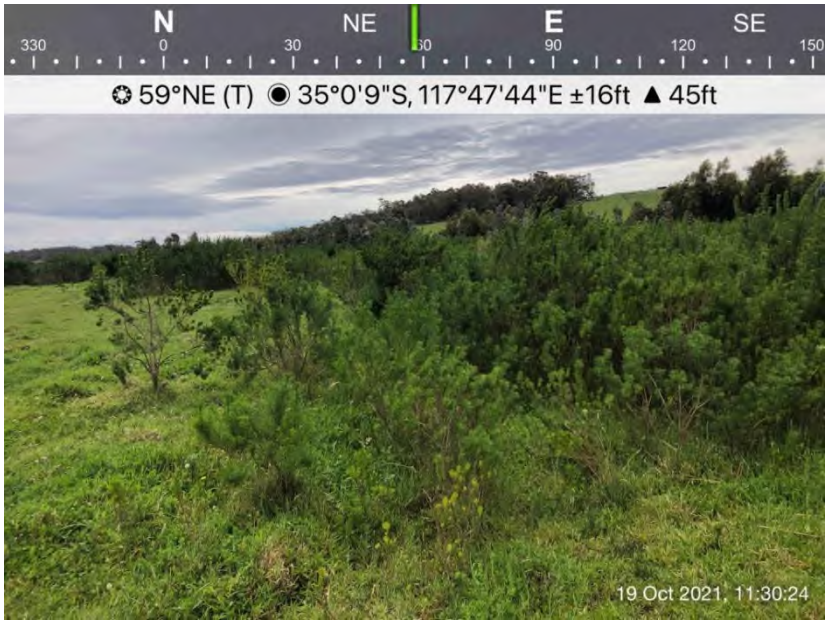
Plot	10	Classification or Exclusion Clause	Scrub Type D
			**Location:** Internal to the subject site in the north and west and external in the north. **Separation Distance:** 0m. **Description:** Scrub vegetation consisting of Taylorina, grasses, sedges and rushes. **Average vegetation height:** 2-4m. **Vegetation Coverage:** >10-30% foliage cover. **Available fuel loading**: 25t/ha. **Effective slope:** Downslope >0-5 degrees.

Photo Id 42: View facing east-northeast towards scrub vegetation, located central west in the subject site.

Plot	10 cont.	Classification or Exclusion Clause	Scrub Type D
			**Additional Photo of Plot 10.**

Photo Id 43: View facing east-southeast towards scrub vegetation, located central west in the subject site.

Plot	10 cont.	Classification or Exclusion Clause	Scrub Type D
			**Additional Photo of Plot 10.**

Photo Id 44: View facing south-southwest towards scrub vegetation, located to the north of the subject site.

Plot	11	Classification or Exclusion Clause	Forest Type A
			**Location:** central north to the subject site. **Separation Distance:** 0m. **Description:** Forest vegetation consisting Warren River Cedar and mixed native and non-native Eucalyptus Trees. Dense canopy cover with multilayered scrub mid/understorey of Acacia, Hibbertia, Taylorina, Banksia, sedges and rushes. *Note: This vegetation plot is upslope/flat in relation to the existing house central north within Lot 125.* **Average vegetation height:** 8-18m. **Vegetation Coverage:** 30-70% foliage cover. **Available fuel loading**: 25-35t/ha. **Effective slope:** Upslope/flat.

Photo Id 45: View facing north towards forest vegetation, located central north in the subject site.

Plot	12	Classification or Exclusion Clause	Forest Type A
			**Location:** central north to the subject site. **Separation Distance:** 0m. **Description:** Forest vegetation consisting Warren River Cedar and mixed native and non-native Eucalyptus Trees. Dense canopy cover with multilayered scrub mid/understorey of Acacia, Hibbertia, Taylorina, Banksia, sedges and rushes. *Note: This vegetation plot is upslope/flat in relation to the proposed new lots impacted by this vegetation.* **Average vegetation height:** 8-18m. **Vegetation Coverage:** 30-70% foliage cover. **Available fuel loading**: 25-35t/ha. **Effective slope:** Upslope/flat.

Photo Id 46: View facing east towards forest vegetation, located central north in the subject site.

Plot	13	Classification or Exclusion Clause	Shrubland Type C
No photo available			**Location:** Internal in proposed stormwater retention basis. **Separation Distance:** 0m. **Description:** low sedgeds and heath species associated with stormwater retention basins. Refer to the LWMS. **Average vegetation height:** 1-1.5m. **Vegetation Coverage:** >10-30% foliage cover. **Available fuel loading**: 15t/ha. **Effective slope:** Downslope >0-5 degrees. Note these areas are applying the precautionary principle based on the findings in the Local Water Management Strategy (LWMS).
No photo.			

COMMENTS ON VEGETATION CLASSIFCATIONS:

- Distances from vegetation were made based on surface fuels to edge of lot (subject site) boundary;
- Effective slopes were measured in the field using a Nikon Forestry Pro and represented on the respective plots;
- Method 1 (AS3959-2018) Simplified procedure was used for vegetation classification Assessment process;
- All vegetation was classified within the subject site and within 150m of the lot boundaries to AS3959 Table 2.3; and
- The perimeter of the vegetation was measured using field GPS and notations on field GIS maps.

CERTIFICATION

I hereby certify that I have undertaken the assessment of the above site and determined the Bushfire Attack Level stated above in accordance with the requirements of AS 3959-2018.

SIGNED, ASSESSOR: ..... DATE: 1/12/2021

Jason Benson, Bio Diverse Solutions
Accredited Level 2 BAL Assessor (Accreditation No: BPAD37893)

REVISION RECORD

Revision	Prepared By	Summary	Reviewed By	Date
Draft Id	Jason Benson	Internal Review	Melanie Haymont	25/10/2021
Final Id	Jason Benson	Final Issued to Client		1/12/2021
Final Id	Kathryn Kinnear	Updated with stormwater retention basis included on vegetation classes mapping		7/12/2022

Appendix B

Original Vegetation Classifications to AS3959 (South)

Vegetation classification to AS3959-2018

Site Details			
Address:	Lot 9001 Lower Denmark Road		
Suburb:	Cuthbert	**State:**	W.A.
Local Government Area:	City of Albany		
Stage of WAPC Planning	Rezoning		

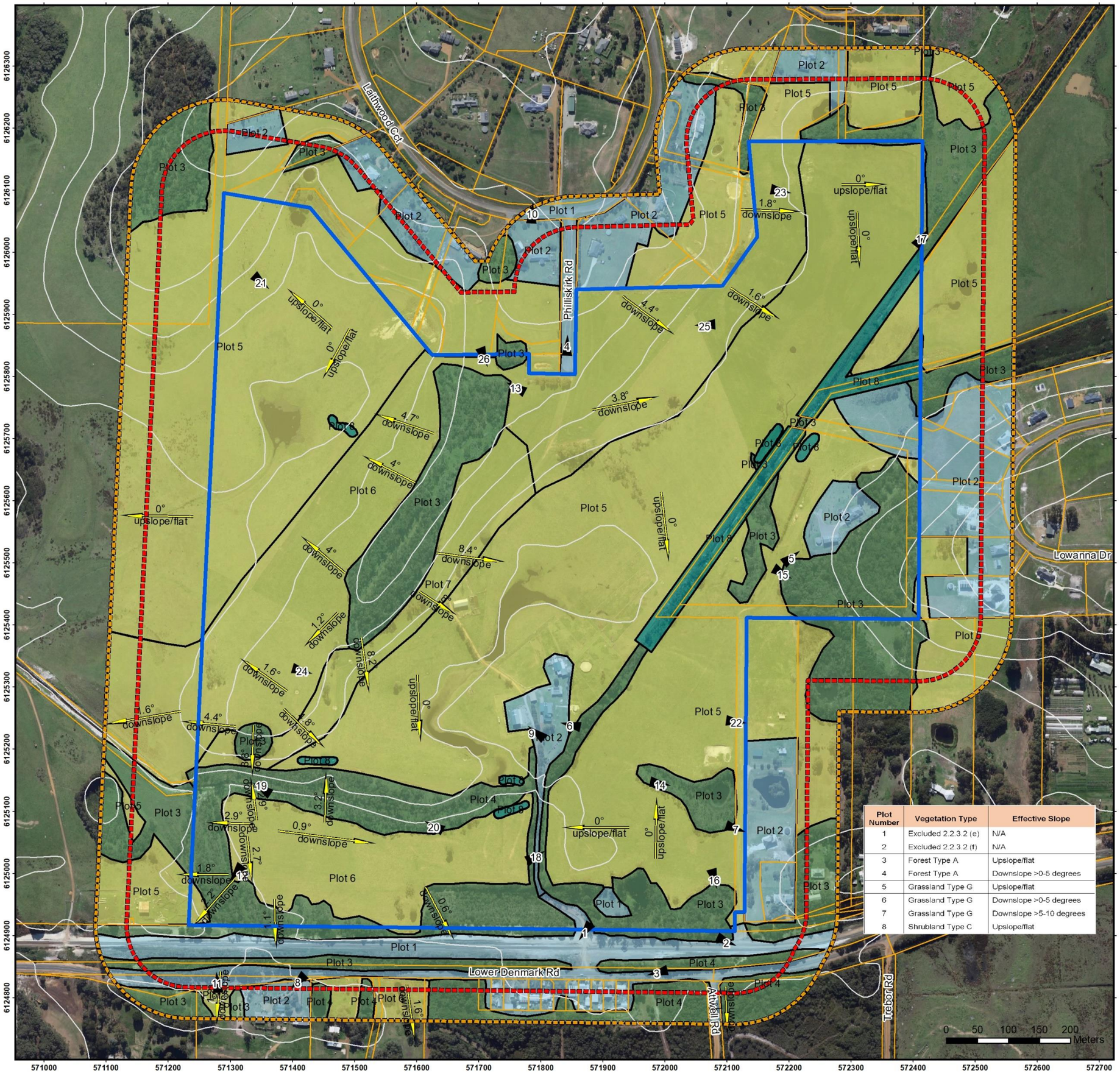
BMP Plan Details			
Report / Job Number:	HD063-004	**Report Version:**	Final
Assessment Date:	11 February 2020	**Report Date:**	19 December 2022
BPAD Practitioner	Kathryn Kinnear	**Accreditation No.**	BPAD 30794

Vegetation Classification

Site assessment occurred on the 12 October 2021 and reviewed in 2022 by Kathryn Kinnear (BPAD 30794). All vegetation within 150m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified in the following pages and shown on the Vegetation Classes Map Page 3.

Table 1: Vegetation Classification Table (in accordance with AS 3959-2018) of the subject site

Plot Number	Vegetation Type	Effective Slope
1	Excluded 2.2.3.2 (e)	N/A
2	Excluded 2.2.3.2 (f)	N/A
3	Forest Type A	Upslope/flat
4	Forest Type A	Downslope >0-5 degrees
5	Grassland Type G	Upslope/flat
6	Grassland Type G	Downslope >0-5 degrees
7	Grassland Type G	Downslope >5-10 degrees
8	Shrubland Type C	Upslope/flat



Plot Number	Vegetation Type	Effective Slope
1	Excluded 2.2.3.2 (e)	N/A
2	Excluded 2.2.3.2 (f)	N/A
3	Forest Type A	Upslope/flat
4	Forest Type A	Downslope >0-5 degrees
5	Grassland Type G	Upslope/flat
6	Grassland Type G	Downslope >0-5 degrees
7	Grassland Type G	Downslope >5-10 degrees
8	Shrubland Type C	Upslope/flat

Albany Office:
29 Hercules Crescent
Albany, WA 6330
(08) 9842 1575

Denmark Office:
7/40 South Coast Highway
Denmark, WA 6333
(08) 9848 1309

Esperance Office:
2A/113 Dempster Street
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BPAD Bushfire Planning & Design Accredited Practitioner Level 2

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Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 5m Contours
- Slopes Degrees
- Photo Point
- Vegetation/Plot Boundary

Vegetation

- Forest Type A
- Shrubland Type C
- Grassland Type G
- Low fuel or non vegetated 2.2.3.2

Scale
1:6,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Barry Panizza
Lot 9001 (No. 688) Lower Denamrk Road
Cuthbert, WA 6330

Vegetation Classes

BAL Assessor	QA Check	Drawn by
KPK	BMT	GSK
STATUS	**FILE**	**DATE**
FINAL	HD063-005	19/12/2022

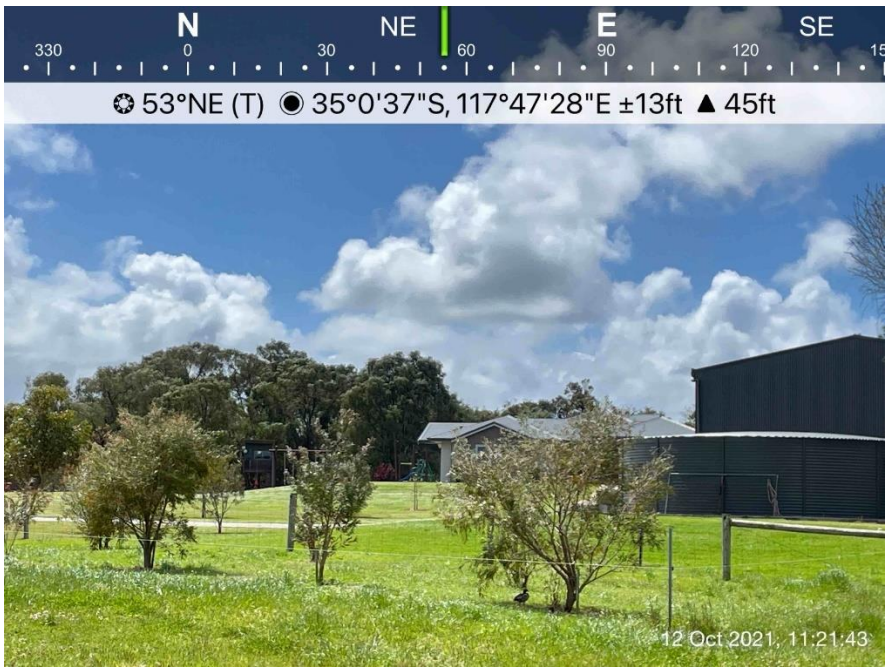
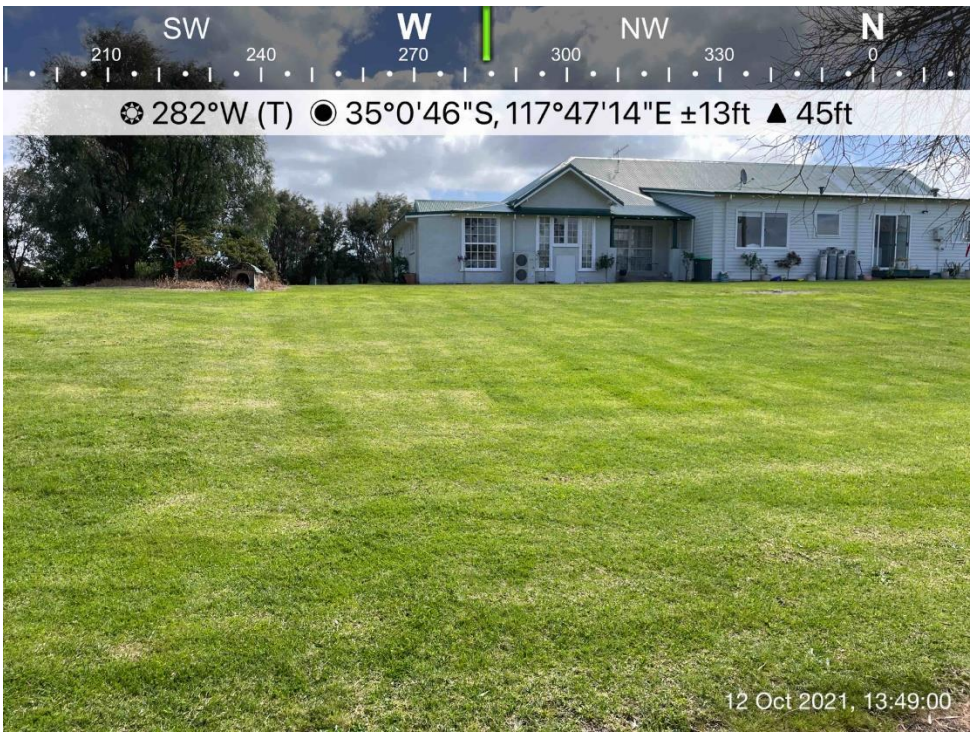
Plot	1	Classification or Exclusion Clause	Excludable - 2.2.3.2(e) Non Vegetated Areas
			**Location:** North and south of the subject site in existing road reserves. **Description:** Roads, driveways, rail corridor and hardstand areas. As per exclusion clause 2.2.3.2 (e) of AS3959-2018.
Photo Id 1: View to the south west of hardstand areas and rail corridor located to the south of the subject site.			
Plot	**1 cont.**	**Classification or Exclusion Clause**	**Excludable - 2.2.3.2(e) Non Vegetated Areas**
			**Additional Photo of Plot 1.**
Photo Id 2: View to the east along the rail corridor, located to the south east of the subject site.			

Plot	1 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(e) Non Vegetated Areas
			**Additional Photo of Plot 1.**

Photo Id 3: View to the west of Lower Denmark Road, located to the south of the subject site.

Plot	1 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(e) Non Vegetated Areas
			**Additional Photo of Plot 1.**

Photo Id 4: View to the north of Phillisirk Road, located to the north of the subject site.

Plot	2	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			**Location:** Within the subject site, north, east and south in APZ areas around existing dwellings and buildings. **Description:** Maintained gardens and lawns in APZ areas surrounding existing buildings. Excluded as per AS3959 exclusion clause 2.2.3.2 (f). **Available fuel loading:** <2 t/ha.
Photo Id 5: View facing north east of low fuel-maintained area, around existing house in the east of the subject site.			
Plot	**2 cont.**	**Classification or Exclusion Clause**	**Excludable - 2.2.3.2(f) Low Threat Vegetation**
			**Additional Photo of Plot 2.**
Photo Id 6: View to the west of low fuel-maintained areas around existing dwelling, located central south of the subject site.			

Plot	2 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			**Additional Photo of Plot 2.**
Photo Id 7: View to the west of low fuel-maintained areas around existing dwelling, located to the south east of the subject site.			

Plot	2 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			**Additional Photo of Plot 2.**
Photo Id 8: View to the south west of low fuel maintained areas around existing dwelling, located to the south of the subject site in the village of Cuthbert.			

Plot	2 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			**Additional Photo of Plot 2.**
Photo Id 9: View to the north west of low fuel-maintained areas around lots, located in Albany Green rural residential subdivision to the north of the subject site.			

Plot	2 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			**Additional Photo of Plot 2.**
Photo Id 10: View to the north west of low fuel-maintained areas around lots located in Albany Green rural residential subdivision to the north of the subject site.			

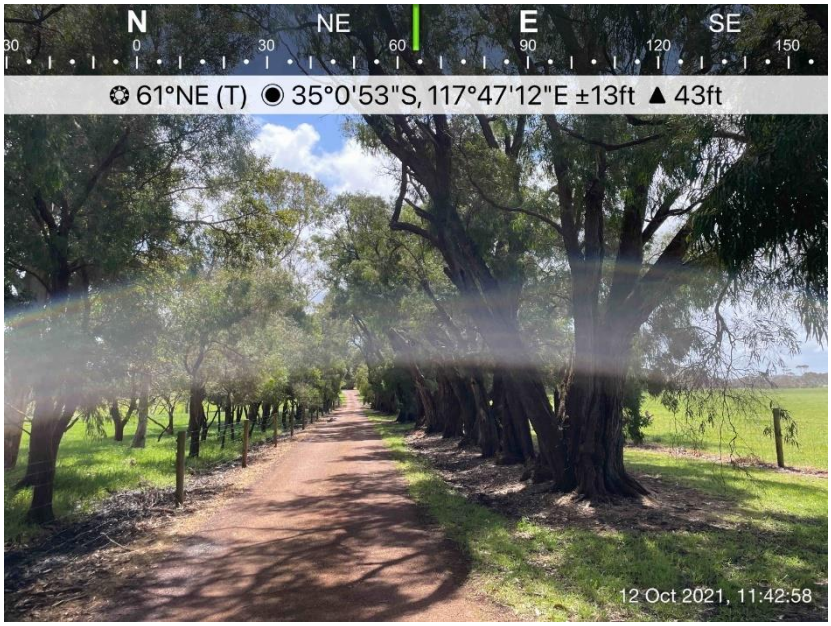
Plot	3	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			**Location:** North, east, southeast and southwest of the subject site. **Separation Distance:** 82m to the north, 21m to the east, 74m to the southeast and 74m to the southwest. **Description:** Forest vegetation consisting of mixed Jarrah, Marri, (some Blue gums) Warren River Cedar and Callistachys trees. Dense canopy cover with multilayered understorey of Acacia, Tea Tree, sedges and rushes. Sometimes grazed with no midstorey but has canopy connection. **Average vegetation height:** 6-10m. **Vegetation Coverage:** 30-70% foliage cover. **Available fuel loading**: 25-35t/ha. **Effective slope:** Upslope/flat.
Photo Id 11: View to the north of Forest Type A, located to the south (external) to the site in rail and road corridors.			
Plot	**3 cont.**	**Classification or Exclusion Clause**	**Class A Forest - Low open forest A-04**
			**Additional Photo of Plot 3.**
Photo Id 12: View to the south-west through Forest Type A located internal to the site, located in the south west of the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			**Additional Photo of Plot 3.** Note: The central areas of Plot 3 have been heavily grazed and have nil to limited understorey, due to canopy connection Forest Type A has been applied.
Photo Id 13: View to the west through Forest Type A, located internal to the site and located in the north of the subject site.			
Plot	**3 cont.**	**Classification or Exclusion Clause**	**Class A Forest - Low open forest A-04**
			**Additional Photo of Plot 3.** Note: Some areas of Plot 3 have been heavily grazed and have nil to limited understorey, due to canopy connection Forest Type A has been applied.
Photo Id 14: View to the east through Forest Type A, located internal to the site and located in the south east of the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			**Additional Photo of Plot 3.**
Photo Id 15: View to the south east through Forest Type A, located internal to the site and located in the east of the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			**Additional Photo of Plot 3.**
Photo Id 16: View to the south through Forest Type A, located internal to the site and located in the south east of the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			**Additional Photo of Plot 3.** Note: The vegetation along the Five-mile Creek has areas of revegetation which due to the wet nature and low-lying location have been classified as future Forest Type A.
Photo Id 17: View to the south east through Forest Type A, located to the east of the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			**Additional Photo of Plot 3.** Note: The vegetation along the driveway in the south has been planted and can be reclassified as low fuel in the future with maintenance and thinning of the planted trees. Utilising the precautionary principle, this been classified as future Forest Type A.
Photo Id 18: View to the north east through Forest Type A, located internal to the site located along the existing driveway.			

Plot	4	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			**Location:** North, east, southeast and southwest of the subject site. **Separation Distance:** 82m to the north, 21m to the east, 74m to the southeast and 74m to the southwest. **Description:** Forest vegetation consisting of mixed Jarrah, Marri, (some Blue gums) Warren River Cedar and Callistachys trees. Dense canopy cover with multilayered understorey of Acacia, Tea Tree, sedges and rushes. Sometimes grazed with no midstorey but has canopy connection. **Average vegetation height:** 6-10m. **Vegetation Coverage:** 30-70% foliage cover. **Available fuel loading**: 25-35t/ha. **Effective slope:** Downslope >0-5 degrees.

Photo Id 19. View to the north west through Forest Type A vegetation, located along Five Mile Creek central south of the subject site.

Plot	4 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			**Additional Photo of Plot 4.**

Photo Id 20: View to the west, north west through Forest Type A vegetation located along Five Mile Creek located central south of the subject site.

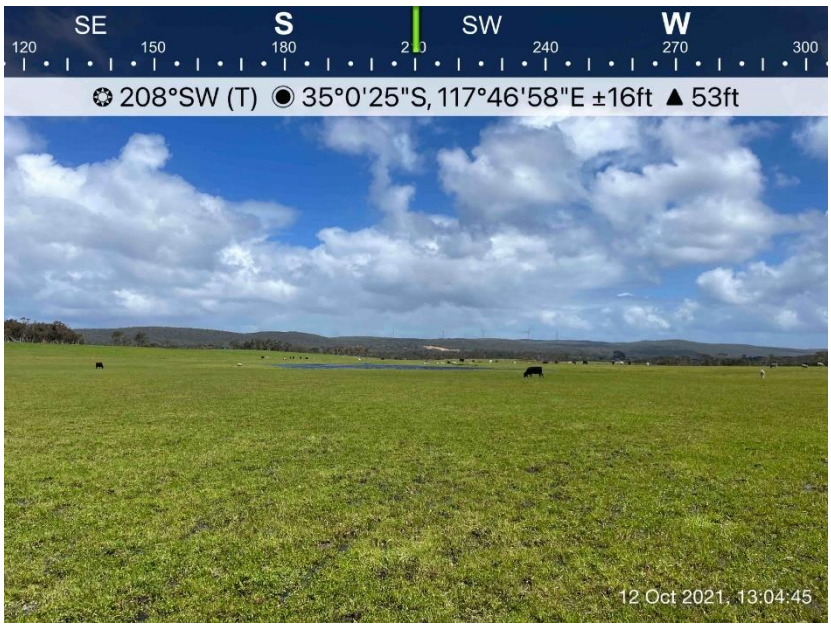
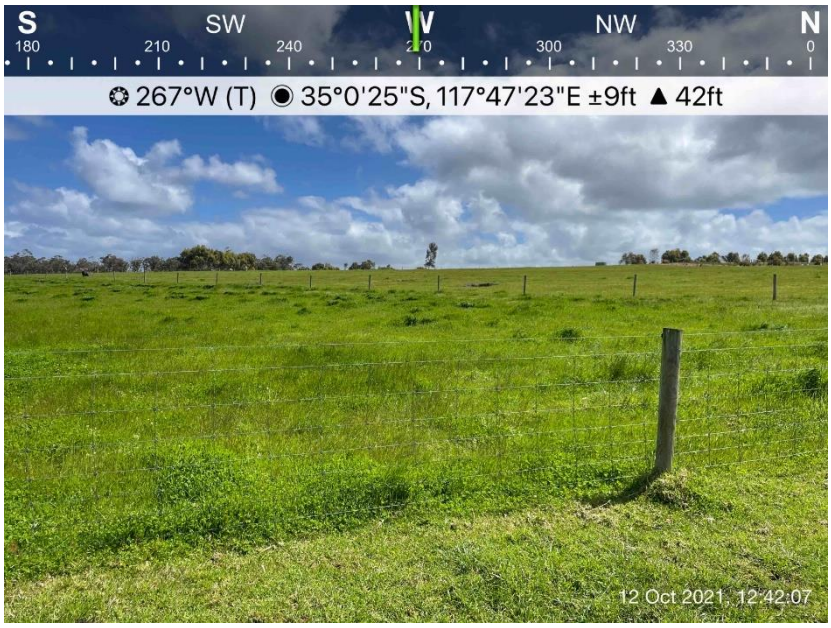
Plot	5	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			**Location:** North-east, south and south-east of the subject site. **Separation Distance:** 0m. **Description:** Kikuyu, rye grass and mixed clovers, and other grazed mixed grasses and weeds. **Average vegetation height:** 100mm. **Vegetation Coverage:** <10% Trees. **Available fuel loading:** 4.5t/ha. **Effective slope:** Upslope/Flat.

Photo Id 21: View facing south west towards Grassland Type G vegetation, located to the north-west of the subject site.

Plot	5 cont.	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			**Additional Photo of Plot 5.**

Photo Id 22: View facing east towards Grassland Type G vegetation, located to the east of the subject site.

Plot	5 cont.	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			**Additional Photo of Plot 5.**
Photo Id 23: View facing east towards Grassland Type G vegetation, located internal north west of the subject site			
Plot	**6**	**Classification or Exclusion Clause**	**Class G Grassland – Sown pasture G-26**
			**Location:** Central to the subject site in upslopes of the subject site. **Separation Distance:** 0m. **Description:** Kikuyu, rye grass and mixed clovers, and other grazed mixed grasses and weeds. **Average vegetation height:** 100mm. **Vegetation Coverage:** <10% Trees. **Available fuel loading:** 4.5t/ha. **Effective slope:** Downslope >0-5 degrees.
Photo Id 24: View facing south-west towards Grassland Type G vegetation, located to the south-west of the subject site.			

Plot	6 cont.	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			**Additional Photo of Plot 6.**
Photo Id 25: View facing-west towards Grassland Type G vegetation located in the north-west of the subject site..			
Plot	**7**	**Classification or Exclusion Clause**	**Class G Grassland – Sown pasture G-26**
			**Location:** Central to the subject site in upslopes of the subject site. **Separation Distance:** 0m. **Description:** Kikuyu, rye grass and mixed clovers, and other grazed mixed grasses and weeds. **Average vegetation height:** 100mm. **Vegetation Coverage:** <10% Trees. **Available fuel loading:** 4.5t/ha. **Effective slope:** Downslope >5-10 degrees.
Photo Id 26: View facing North East towards Grassland Type G vegetation located to in the central areas of the subject site.			

Plot	8	Classification or Exclusion Clause	Shrubland Type C
No photo available			**Location:** Internal in proposed stormwater retention basis. **Separation Distance:** 0m. **Description:** low sedges and heath species associated with stormwater retention basins. Refer to the LWMS. **Average vegetation height:** 1-1.5m. **Vegetation Coverage:** >10-30% foliage cover. **Available fuel loading**: 15t/ha. **Effective slope:** Downslope >0-5 degrees. Note these areas are applying the precautionary principle based on the findings in the Local Water Management Strategy (LWMS).
No photo.			

COMMENTS ON VEGETATION CLASSIFCATIONS:

- Distances from vegetation were made based on surface fuels to edge of lot (subject site) boundary;
- Effective slopes were measured in the field using a Nikon Forestry Pro and represented on the respective plots;
- Method 1 (AS3959-2018) Simplified procedure was used for vegetation classification Assessment process;
- All vegetation was classified within the subject site and within 150m of the lot boundaries to AS3959 Table 2.3; and
- The perimeter of the vegetation was measured using field GPS and notations on field GIS maps.

CERTIFICATION

I hereby certify that I have undertaken the assessment of the above site and determined the Bushfire Attack Level stated above in accordance with the requirements of AS 3959-2018.

SIGNED, ASSESSOR: ..... DATE: 19/12/2022

Kathryn Kinnear , Bio Diverse Solutions
Accredited Level 2 BAL Assessor (Accreditation No: BPAD30794)

BIO DIVERSE SOLUTIONS

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

REVISION RECORD

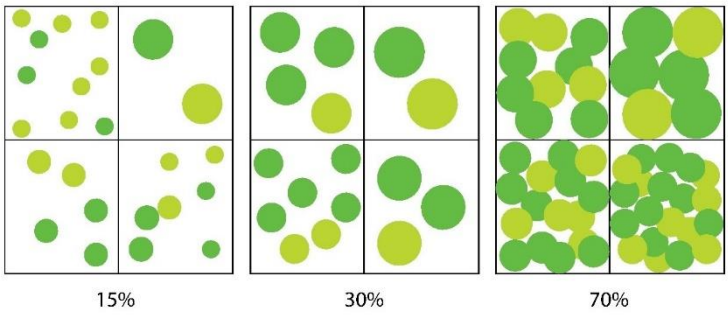
Revision	Prepared By	Summary	Reviewed By	Date
Draft Id	Kathryn Kinnear	Internal Review	Mary Holt	19/12/2022
Final Id	Kathryn Kinnear	Final Issued to Client	Jason Benson	19/12/2022

Appendix C

Schedule 1 WAPC Asset Protection Zone (APZ) standards to apply

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. **Figure 19:** Tree canopy cover – ranging from 15 to 70 per cent at maturity 
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Grass	• Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	• Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*