Draffins Development Application

Woodside Native Reforestation Project - Phase 4

TABLE OF CONTENTS

1. Existing Land Use

The 1,789 ha “Draffin’s Farm” property located at 77 Pollard Road, Kalannie WA was purchased by Woodside Energy Carbon (Services) Pty Ltd (WEC(S)) in October 2022. The property consists of the following Lots;

- Lot 2165 on Deposited Plan #148432, Volume 1682 Folio 317
- Lot 2421 on Deposited Plan #148432, Volume 1766 Folio 194
- Lot 2535 on Deposited Plan #163150, Volume 2116 Folio 917
- Lot 2541 on Deposited Plan #150610, Volume 1682 Folio 317
- Lot 4071 on Deposited Plan #167578, Volume 2116 Folio 916

The property was purchased as an owner-operated mixed cropping and grazing enterprise. There is a dwelling, sheds and tanks on site however there hasn’t been a full-time resident on the property for several years. The property is located approximately 17km south-east of the Kalannie Townsite. There is a mix of soil types including sandplain, loams and red clays. The deep sandy soils over much of the property are not conducive to support high productivity agriculture. There is approximately 500 ha of more productive Salmon Gum loams in the North-eastern regions of the property which is in the process of being sold in order to remain as farmland (see section 2). Sections of the western side of the property are characterised with high weed burden and evidence of wind erosion.

2. Proposed Land Use

It is proposed that the property will be repurposed into a mixed carbon farming and agricultural system. WEC(S) has executed a contract for sale of rural land with a neighbouring farmer to re-align title boundaries and selldown approximately 500ha of land. A preliminary design is provided in Appendix A. This design is subject to minor refinements post title boundary realignment and award of contracts for site preparation and planting.

The title boundary realignment is intended to separate the high and low productivity land by title boundaries, enabling the highest and best use of the land to be achieved by putting the best operator on their preferred land. Lots 2165, 2421 and 2541 will be impacted by this re-alignment. The Selldown Area contains the higher productivity land and will remain a mixed cereal and grazing enterprise. Carbon farming the remaining low productivity land is expected to provide additional benefits including linking remnant vegetation, increasing biodiversity, reducing erosion, and providing varied financial and community opportunities. The main housing node which contains the dwelling plus several sheds and tanks is included within the proposed Selldown Area. Settlement of the Selldown Area will be post planting season to enable contractors to stay in the homestead on the property.

Carbon farming will be conducted by WEC(S) using the Carbon Farming initiative (CFI) Act - Reforestation by Environmental or Mallee Plantings-FullCAM method. This method involves seeding and/or planting using local native species of plants with the objective of establishing a native forest. The key target characteristics are for the forest to achieve 2m height with 20% canopy cover. A “block planting” method will be used whereby portions of the property are subdivided by vegetation community type and planted in furrows spaced ~6 m apart such that continuous forest cover is achieved. Species will include *Acacia acuminata* (Jam), *Eucalyptus salubris* (Gimlet), *Eucalyptus kochii* (Oil Mallee), *Eucalyptus loxophleba* (York Gum), and a selection of native trees and shrubs from those exhibited in the existing remnant vegetation. A permanence period of 100 years has been nominated for the project. This means that WEC(S) must ensure the carbon stock established is maintained *in situ* for this period.

It is proposed that there will be no permanent residents on the property that WEC(S) retains post completion of the realignment and selldown.

3. Land Use Compatibility

The Dalwallinu Local Planning Scheme (LPS)[1] classifies the property and adjoining lands as "Rural", as depicted in Appendix D.

The Shire of Dalwallinu LPS Section 4.2.7 defines the objectives of a "Rural Zone" to be:

a. *To provide for a range of rural pursuits that are compatible with the capability of the land and retain the rural character and amenity of the locality.*
b. *To protect land from urban uses that may jeopardise the future use of that land for other planned purposes that are compatible with the zoning.*
c. *To support sustainable farming practices and the retention of remnant vegetation.*
d. *To prevent any development that may affect the viability of a holding.*
e. *To encourage small scale, low impact tourist accommodation in rural locations.*
f. *To encourage a diversification of rural activities that will reduce the dependency of the rural sector on traditional crops.*
g. *To support the creation of homestead lots in accordance with adopted Local Planning Policy.*
h. *To support mining activities where an environmental management plan has been prepared and is acceptable to the Council and EPA.*
i. *To preclude the disposal of used tyres or any other material that may be detrimental to the quality of the land.*

This project is considered consistent with this objective for the following reasons:

a. The property is in the process of being re-aligned as to separate the high and low productivity land. A contract has been executed for the sale of the higher productivity land to a local farmer who is expected to continue agricultural practices. Returning land of low agricultural productivity to native vegetation increases biodiversity of the region whilst maintaining aesthetics compatible with adjacent land uses.
b. There are no planned urban land uses on the property.
c. The project is proposed to re-link small remnants of vegetation on the property and provide broader linkages to neighbouring vegetation remnants. A mixed native forest system may assist in stabilising soil and increasing biodiversity in the region.
d. The viability of the land is proposed to be maintained by keeping the more productive land as agriculture and planting the low productivity land for the aforementioned benefits of a forest system.
e. The dwelling on the property has been maintained and is proposed to be sold with the higher productivity land. Whilst tourists and travellers will not be able to access the remaining property directly, those attracted by the natural environment (e.g. wildflower season) may find the proposed biodiverse plantings complementary.
f. Carbon farming is a diversification of traditional farming practices that provides additional benefits, including linking reserves and remnant vegetation, reducing erosion, and providing varied and unique financial and community opportunities to the local district. WEC(S) intends to continue investigating complementary land uses such as bee keeping and bush foods where these are acceptable to the Clean Energy Regulator (CER).
g. While no new homesteads are expected to be created, the dwelling on the property has been maintained and is proposed to be sold with the higher productivity land.

[1] Shire of Dalwallinu Local Planning Scheme No 2 Scheme text (www.wa.gov.au)

h. There are no current mining tenements over the property. While mining on land that has been planted is undesirable, Woodside's base business is in extractive resources and would cooperate to achieve the best outcome for all parties if future tenements are granted.
i. Waste types generated by activities would be consistent with the property's existing agricultural use and will be sent to a licensed waste management facility or returned to suppliers. A specialist contractor is proposed to be engaged to clear waste present on the land at the time of purchase and sent to a licensed facility for disposal and recycling.

The project is also consistent with the relevant Natural Resource Management Plan for the region (NARvis: the regional natural resource management strategy for the Northern Agricultural Region 2021 – 2030) contains several climate change related goals. Goal 2 of the strategy is to implement 30 ecosystem-based climate change adaptation projects by 2030.

4. Development Activities

The activities required can be described as follows:

1. Demolition (if required)
2. Pre-planting weed and pest control
3. Ground preparation – consisting of machine ripping, scalping and mounding (where required)
4. Planting
5. Post-planting weed and pest control.

Demolition of redundant structures may be required in order to minimise ongoing maintenance costs and reduce any risks associated with older structures with loose sheeting or corroded structural elements. Specialist contractors are proposed to be engaged to undertake these activities. Existing fixed infrastructure is depicted in Appendices B and C.

Weed and pest control will be similar to that conducted for an agricultural enterprise with potential summer emergent knockdowns and a pre-planting broad spectrum knockdown. Vertebrate pest control will also be conducted for a period of approximately 3 years. Post planting spraying will be conducted using selective herbicides, shielded sprayers, and/or mechanical methods. Within ~5 years native species are expected to outcompete weed species therefore ongoing weed and pest spraying is likely to be minimal or not required. Pre-planting weed spraying will occur in ~April-June 2023.

Ground preparation is expected to involve a tractor-pulled rip and scalp attachment over the majority of the property. Furrows and mounds will generally follow existing agricultural workings with a ~6 m spacing between each. Continuous 24h operations may be required to take advantage of ideal weather conditions and up to three tractors may operate simultaneously. These operations would be considered typical farming activities with typical broad-acre farming equipment.

Native trees are planned to be planted by hand at ~3 m intervals within each furrow. It is estimated that planting will commence in ~mid-June 2023 and continue for ~8 weeks. Direct seeding is not proposed for this project.

During the development activities, some workers will likely be staying on the property in the existing homestead. All required health and safety checks including structural, electrical, and water have been conducted.

5. Ongoing Activities

Once initial establishment is complete, ongoing carbon farming activities will consist of:

1. Monitoring and audit
2. Property maintenance
3. Infill planting (if required).

Permanent monitoring stations will be established to evaluate planting success and the need for infill planting. Monitoring will use a combination of field and remote sensing (e.g. drones, satellite imagery) techniques. The Clean Energy Regulator (CER) is also expected to undertake periodic audits of the project.

WEC(S) owns property maintenance equipment and employs a full time Carbon Farm Manager, along with several farm assistants and contractors to ensure property maintenance activities (e.g. firebreaks) can be undertaken in a timely and safe manner.

6. Products and Services

The primary product generated by this development will be Australian Carbon Credit Units (ACCUs) which will be issued by the CER to WEC(S). Other products are dependent on successful leasing of portions of the property for agricultural purposes but would be consistent with surrounding land use.

7. Employment and Local Content

Wherever practicable WEC(S) will seek to employ local contractors/community and purchase local goods and services. Key opportunities include:

- Farm maintenance equipment (see above) which has been procured from a local Kalannie business.
- Chemicals are likely to be procured from local Kalannie businesses.
- Contractor executing all 2023 projects across WA will achieve at least 25% indigenous participation.
- It is anticipated that timing of planting activities will be slightly later than agricultural seeding activities in the region as the less labour-intensive tasks of weed management and ground preparation will occur prior following the first substantial winter rains. Demand for local accommodation during summer harvest periods will be minimal.

Once established, this individual project is not expected to result in employment of any permanent workforce.

8. Waste Management

The primary source of waste from the project would be associated with demolition, if required. A specialist demolition contractor would be engaged, with waste sent to a licensed facility for disposal and recycling. It is likely that demolition of any buildings would require asbestos management by specialised, licenced contractors.

Other waste types would be consistent with the property's existing agricultural use such as spent herbicide and pesticide containers, which will be sent to a licensed waste management facility or returned to suppliers.

9. Fire Management

A suitably accredited bushfire practitioner[2] has been engaged to prepare a Fire Management Plan for the property. The plan will outline how planting design has been completed according to bushfire management requirements from both the Shire of Dalwallinu and FESA Guidelines for Plantation Fire Protection. This plan will be submitted to the Shire for consideration by 1 September 2023 and updated by the start of each subsequent bushfire season, if required. WEC(S)owns two vehicle mounted firefighting units and one firefighting trailer. A combination of these will be present during property maintenance activities in summer months. WEC(S)

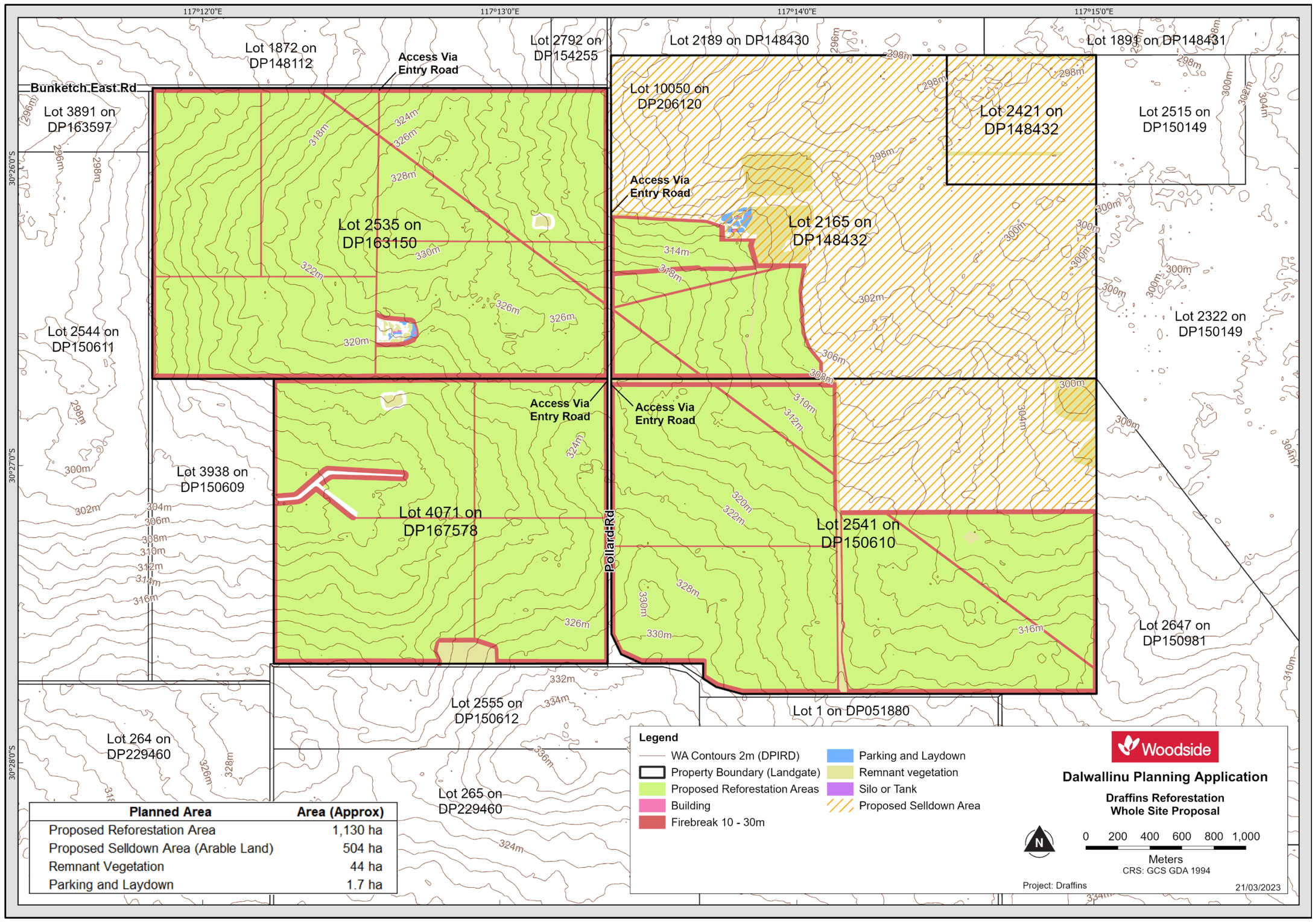
[2] Bushfire Planning and Design (BPAD) accredited practitioner

Carbon Farm Manager or farm assistants are proposed to become a member of Dalwallinu fire brigade.

10. Traffic Management

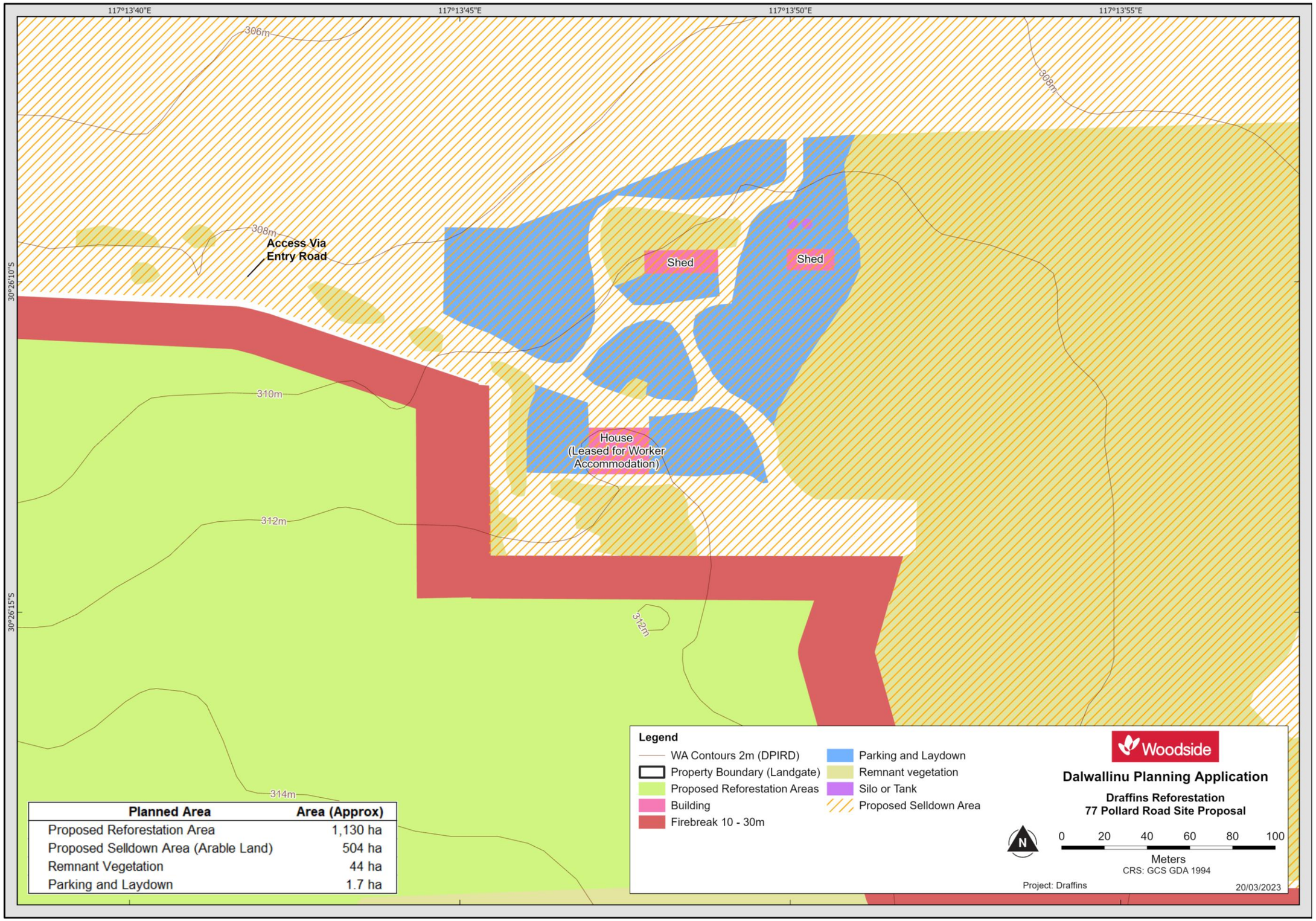
Traffic associated with the project is expected to be similar to other agricultural activities in the region (e.g. tractor movements on public roads) during the 1-2 year period of Development Activities above. Beyond this period, negligible levels of traffic movement are anticipated in relation to the reforested regions of the property. The Selldown Area that remains as traditional agriculture will experience traffic levels consistent with local farming practices.

APPENDIX A: Proposed Preliminary Reforestation Plan



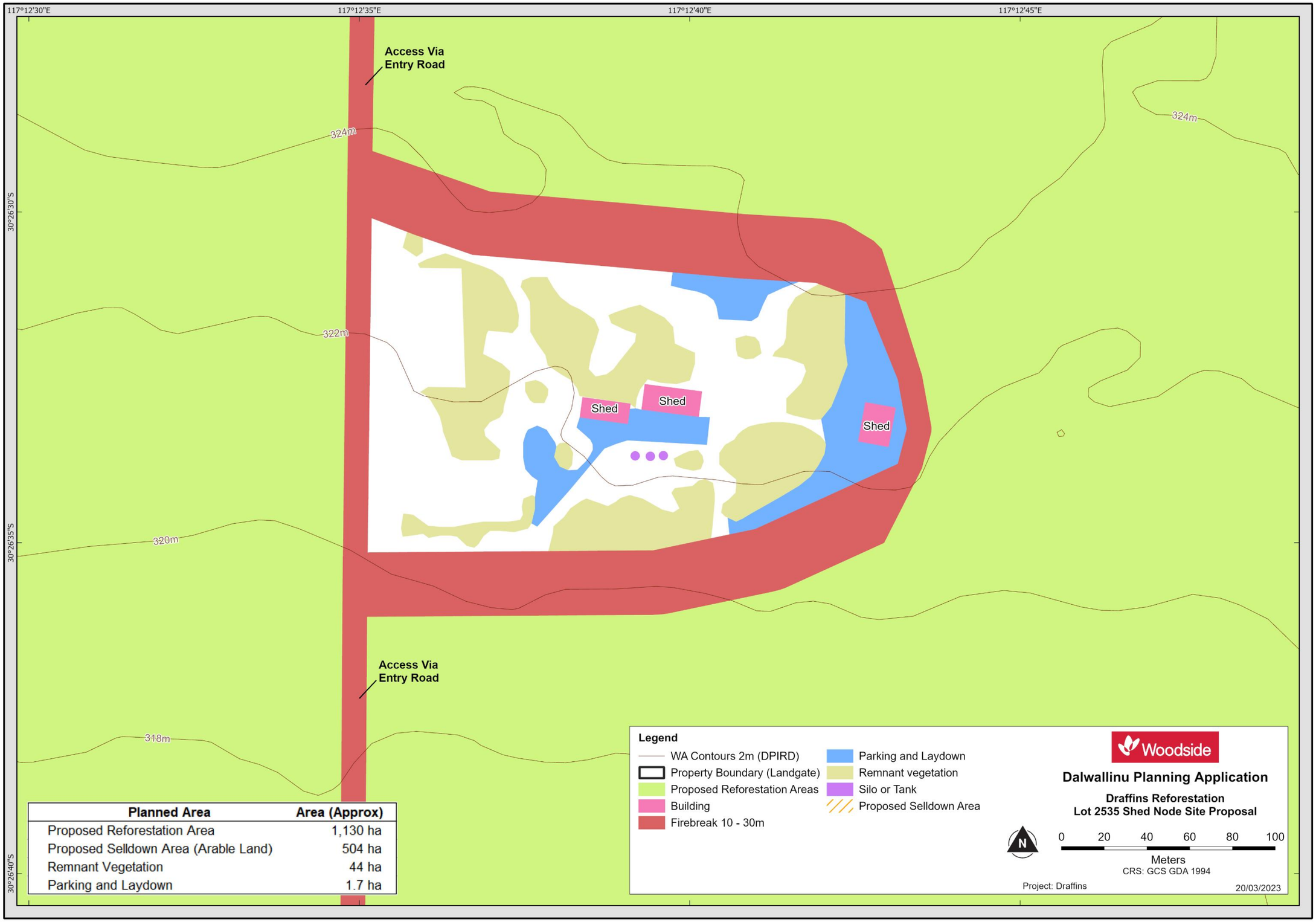
Planned Area	Area (Approx)
Proposed Reforestation Area	1,130 ha
Proposed Selldown Area (Arable Land)	504 ha
Remnant Vegetation	44 ha
Parking and Laydown	1.7 ha

APPENDIX B: Existing Infrastructure - 77 Pollard Rd



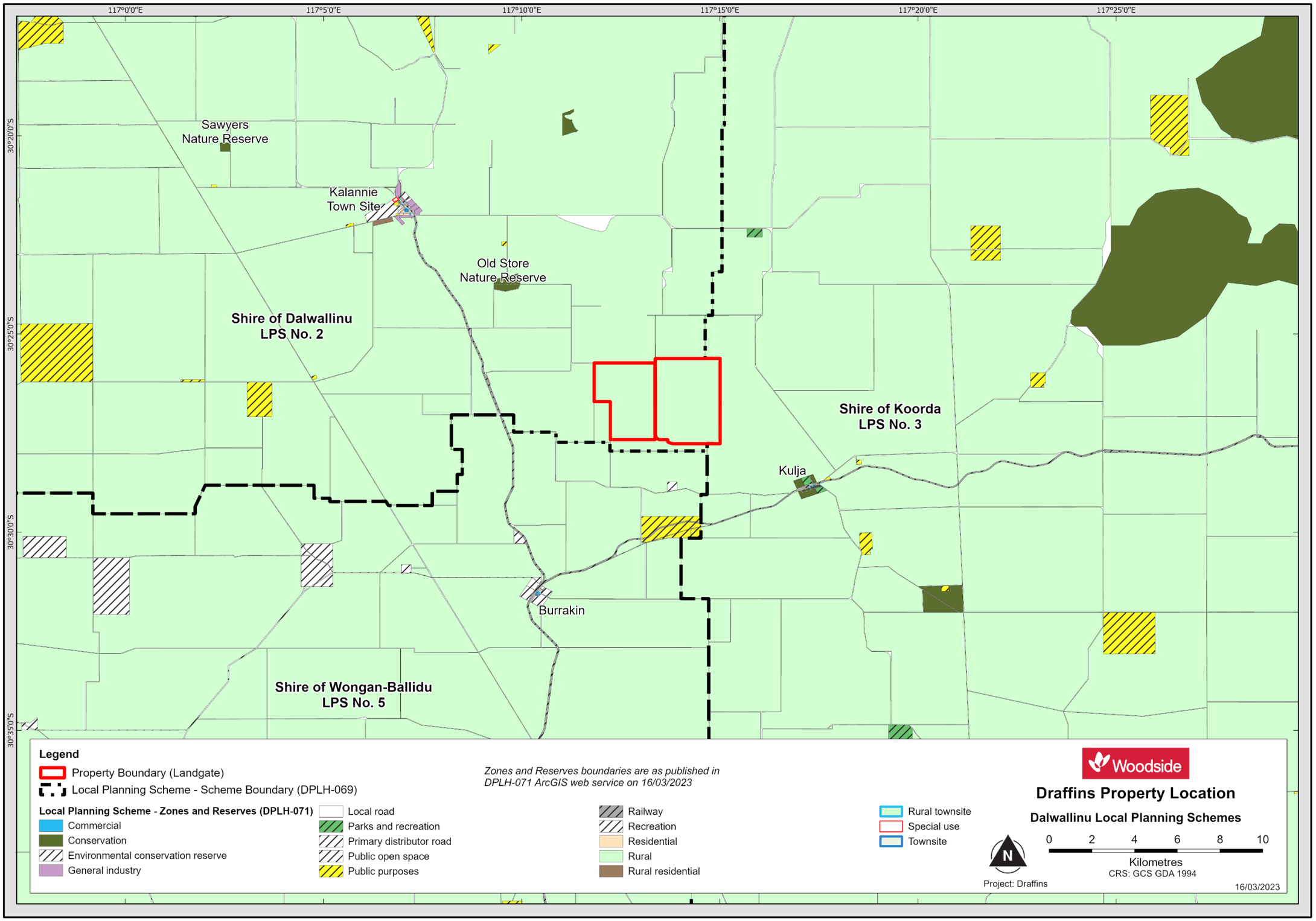
Planned Area	Area (Approx)
Proposed Reforestation Area	1,130 ha
Proposed Selldown Area (Arable Land)	504 ha
Remnant Vegetation	44 ha
Parking and Laydown	1.7 ha

APPENDIX C: Existing Infrastructure – Lot 2535



Planned Area	Area (Approx)
Proposed Reforestation Area	1,130 ha
Proposed Selldown Area (Arable Land)	504 ha
Remnant Vegetation	44 ha
Parking and Laydown	1.7 ha

APPENDIX D: Local Planning Scheme



APPENDIX E: Application Form

Draffins Development Application

Head Office
Mia Yellagonga
11 Mount Street
Perth WA

Postal address:
GPO Box D188
Perth WA 6840
Australia

T: +61 8 9348 4000
F: +61 8 9214 2777
E: companyinfo@woodside.com.au

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: 612 Bunketch East Road & 77 Pollard Road, Kalannie

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 06 Month February Year 2023

Report author or reviewer: Kathy Nastov

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner ☑

If accredited please provide the following.

BPAD accreditation number: 27794 Accreditation expiry: Month August Year 2023

Bushfire management plan version number: #220924 (v1.0)

Bushfire management plan date: Day 27 Month March Year 2023

Client/business name: Woodside Energy Ltd

	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 bushfire protection criteria elements)?		✓

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		
Strategic planning proposal (including rezoning applications)		
High risk land-use		
Vulnerable land-use		

None of the above ☑

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Not Applicable

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

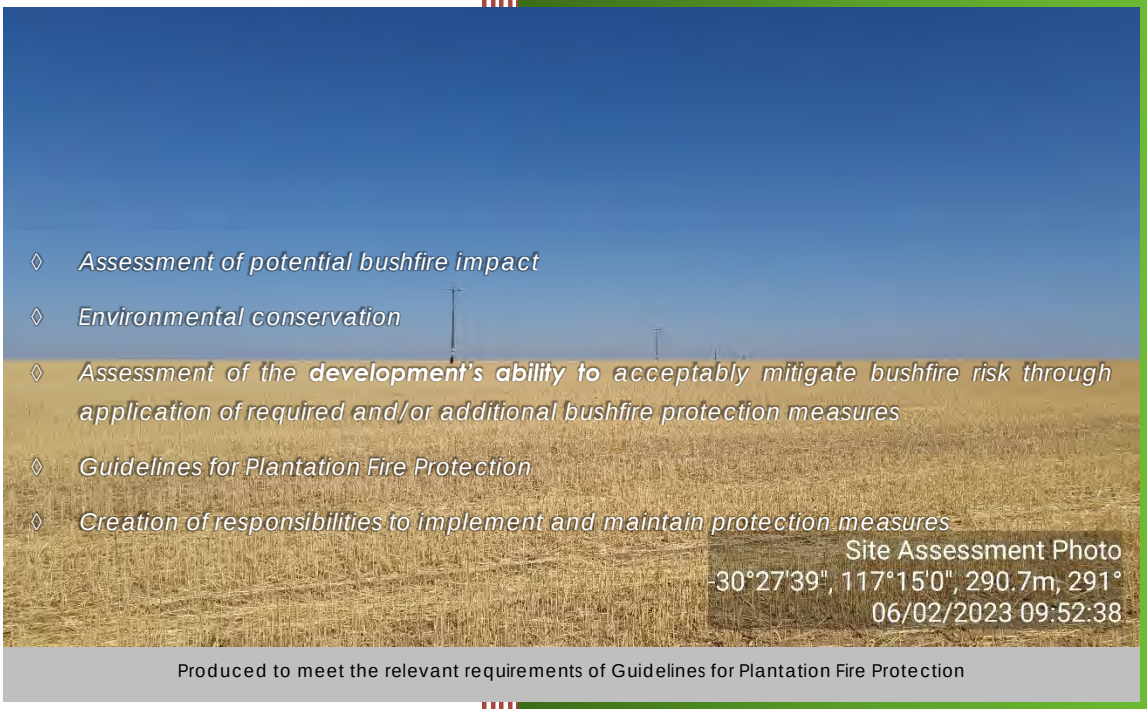
Signature of report author or reviewer: K. Nastov

Date: 27 / 03 / 2023

BUSHFIRE PRONE PLANNING

Woodside Native Reforestation Stored Carbon Project – Draffins (Kalannie)

Bushfire Management Plan (BMP)



Produced to meet the relevant requirements of Guidelines for Plantation Fire Protection

612 Bunketch East Road, Kalannie

77 Pollard Road, Kalannie

Shire of Dalwallinu

Change in Land Use – Plantations

27 March 2023

Job Reference No: 220924

BPP GROUP PTY LTD T/A BUSHFIRE PRONE PLANNING

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DOCUMENT CONTROL

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Author:	Greg Dunstan (BPAD Level 1 No. 16382)	
Reviewed:	Kathy Nastov (BPAD Level 3 No. 27794)	

VERSION HISTORY		
Version	Details	Date
1.0	Original	27 March 2023
-	-	

BMP (Master) Template v9.1

DISTRIBUTION					
Destination		Version	No. Copies	Hard Copy	Electronic Copy
Person	Email				
Gareth Parry	gareth.parry@woodside.com	1.0		☐	☒
Murray Gmeiner	murray.gmeiner@woodside.com	1.0		☐	☒

Limitations: The protection measures contained in this Bushfire Management Plan are minimum requirements and they do not guarantee that buildings or infrastructure will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the recommended protection measures will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents, arising out of the services provided by their consultants.

TABLE OF CONTENTS

LIST OF FIGURES

THIS DOCUMENT – STATEMENT OF PURPOSE

The Bushfire Management Plan (BMP)

The BMP sets out the required package of bushfire protection measures to lessen the risks associated with a bushfire event. It establishes the responsibilities to implement and maintain these measures.

The BMP also identifies the potential for any negative impact on any environmental, biodiversity and conservation values that may result from the application of bushfire protection measures or that may limit their implementation.

Risks Associated with Bushfire Events

The relevant risks are the potential for loss of life, injury, or destroyed or damaged assets which results in personal loss and economic loss. For a given site, the level of that risk to persons and assets (the exposed elements) is a function of the potential threat levels generated by the bushfire hazard, and the level of exposure and vulnerability of the at risk elements to the threats.

Bushfire Protection Measures

The required package of protection measures is established by *the Bush Fire and Environmental Protection Branch (Department of Fire and Emergency Services of WA*. These measures are limited to those considered by the WA planning authorities as necessary to be addressed for the purpose of the plantation industry. They do not encompass all available bushfire protection measures as many are directly relevant to a planning approval stage. For example:

- Protection measures to reduce the vulnerability of buildings to bushfire threats is primarily dealt with at the building application stage. They are implemented through the process of applying the Building Code of Australia in accordance with WA building legislation and the application of construction requirements based on a building's level of exposure - determined as a Bushfire Attack Level (BAL) rating); or
- Protection measures to reduce the threat levels of consequential fire (ignited by bushfire and involving combustible materials surrounding and within buildings) and measures to reduce the exposure and vulnerability of elements at risk exposed to consequential fire, are not specifically considered.

The package of required bushfire protection measures established by the Guidelines for Plantation Fire Protection includes:

- Planning for Plantation Fire Management.
- Plantation Fire Protection Specifications.
- Equipment and Training.

The set of fire protection standards for plantations aims to protect human life and local community interests, while minimising fire risk to plantation assets.

Compliance of the Proposed Land Use with 'Guidelines for Plantation Fire Protection' Requirements

The BMP indicates how the proposed land use is able to implement and maintain the required 'acceptable' measures and any additionally recommended bushfire protection strategies - or its capacity to satisfy the Guidelines intent through the justified application of additional bushfire protection measures as supportable 'alternative' solutions.

Compliance of the Proposed Development or Use with SPP 3.7 Requirements

The BMP assesses the capacity of the proposed development or use to implement and maintain the required 'acceptable' solutions and any additionally recommended bushfire protection measures - or its capacity to satisfy the policy intent through the justified application of additional bushfire protection measures as supportable 'alternative' solutions.

The package of required bushfire protection measures established by the Guidelines includes:

- The requirements of the bushfire protection criteria which consist of:
  - Element 1: Location (addresses threat levels).
  - Element 2: Siting and Design of Development (addresses exposure levels of buildings).
  - Element 3: Vehicular Access (addresses exposure and vulnerability levels of persons).
  - Element 4: Water (addresses vulnerability levels of buildings).

THE PROPOSED DEVELOPMENT/USE – BUSHFIRE PLANNING COMPLIANCE SUMMARY		
Environmental Considerations		Assessment Outcome
Will identified environmental, biodiversity and conservation values limit the full application of the required bushfire protection measures?		No
Will identified environmental, biodiversity and conservation values need to be managed in the implementation and maintenance of the bushfire protection measures - but not limit their application?		Yes
Summary Statement: The proposal will include revegetation of native plant assemblages. The establishment and maintenance of the required Asset Protection Zone(s) around existing buildings or assets of value will be implemented.		
Required Bushfire Protection Measures The Acceptable Solutions of the Bushfire Protection Criteria (Guidelines)		Assessment Outcome
Element	The Acceptable Solutions	
1: Location	A1.1 Development location	Fully Compliant
2: Siting and Design of Development	A2.1 Asset Protection Zone (APZ)	Fully Compliant
3: Vehicular Access	A3.1 Public roads	Fully Compliant
	A3.2a Multiple access routes	Fully Compliant
	A3.2b Emergency access way	N/A
	A3.3 Through-roads	N/A
	A3.4a Perimeter roads	N/A
	A3.4b Fire service access route	N/A

	A3.5 Battle-axe legs	N/A
	A3.6 Private driveways	Fully Compliant
4: Water	A4.1 Identification of future water supply	N/A
	A4.2 Provision of water for firefighting purposes	Fully Compliant
Other Documents Establishing Bushfire Protection Measure Variations or Additions		N/A
The Methodology Applied to the Development of an Alternative Solution The necessity for an alternative solution is in response to non-compliance with the applicable acceptable solutions.		N/A
Other 'Bushfire Planning' Documents to Be Produced		N/A

1 PROPOSAL DETAILS AND THE BUSHFIRE MANAGEMENT PLAN

1.1 The Proposed Land Use Details, Plans and Maps

Land use type:	Reforestation Plantation for the purposes of carbon stores
Factors that have identified the proposal's bushfire planning requirements:	Compliance with applicable local government legislation obligations. State Planning Policy 3.7 and the associated Guidelines for Planning in Bushfire Prone Areas Australian Government Clean Energy Regulator requirements for proponents to manage the risk of bush fire in Emissions Reduction Fund vegetation projects. Department of Fire and Emergency Services (DFES) Guidelines for Plantation Fire Protection (as agreed upon by the Forest Industries Federation of Western Australia (FIFWA)).
Subject lot/site total area:	Landgate Lot on Plan: P163150 2535 (442.9740 hectares) Landgate Lot on Plan: P148432 2165 (461.2329 hectares) Landgate Lot on Plan: P167578 4071 (318.7608 hectares) Landgate Lot on Plan: P150610 2541 (501.4830 hectares)
Plantation type(s):	Native Mixed Species – Mallee dominant
Description of the proposed development/use:	
Objective: Provide bushfire protection standards for the Plantation that aim to protect life and local community interests, while minimising fire risk to the plantation assets. This Bushfire Management Plan contains both an operational component and a Development Application Planning component. The intent of the Plantation for carbon stores is to retain native vegetation where possible, avoid unnecessary clearing and minimise environmental impact on the site. The bushfire management plan provides specific detail on the management and configuration of 'Cells' with the intent on minimising the ignition sources and potential for bushfire originating within the site. The Plantation requires compliance elements with the Shire of Dalwallinu Bush Fire Information (Firebreak Notice), in conjunction with the Guidelines for Plantation Fire Protection. Areas outside of site are not under the control of the landowner. The management of these areas is limited generally to unprogrammed or un-coordinated seasonal planned burning (where undertaken by an adjoining landowner) and firebreak maintenance. Woodside is responsible for the ongoing management of the plantation site.	

117°12'0"E
117°12'30"E
117°13'0"E
117°13'30"E
117°14'0"E
117°14'30"E
117°15'0"E

30°26'0"S
30°26'30"S
30°27'0"S
30°27'30"S
30°28'0"S

3.7ha
84.4ha
65.3ha
66.2ha
24.1ha
7.7ha
71.3ha
86.7ha
73.8ha
57.8ha
2.3ha
94.2ha
60ha
18.5ha
7.9ha
27.7ha
18ha
8.3ha
16.2ha
98.5ha
95ha
51ha
92ha

Legend

Planting Line Direction
- East-West
- North-South
- Northwest-Southeast
- Firebreak
- Property Boundary

Total Planting Hectares: 1,130

N

0 200 400 600 800 1,000
Meters

CRS: GCS GDA 1994

Woodside Energy

Draffins 2023 Planting Plan

Woodside Native Reforestation Phase 4

REV 1

Project: Draffins

20/03/2023

Figure 1.1

Location Plan

KALANNIE SITE (DRAFFINS)
KALANNIE
SHIRE OF DALWALLINU

SUBJECT SITE
KALANNIE BFB
KULJA BFB

------ LEGEND ------

- Subject Site
- Local Government Authority
- Locality / Suburb
- Bush Fire Brigade

Reserves

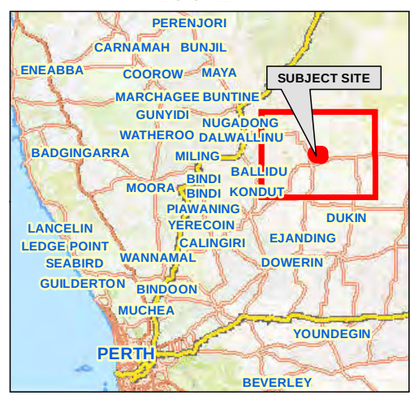
- Reserves

Legislated Lands and Waters

- Nature Reserve

0 2 4 6 8 10
Kilometres

------ LOCALITY ------



Aerial Imagery : Landgate/SLIP
Image Date : 2012

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 24/03/2023
Map updated by: Ian Ross 24/03/2023
A3 Scale 1:250,000

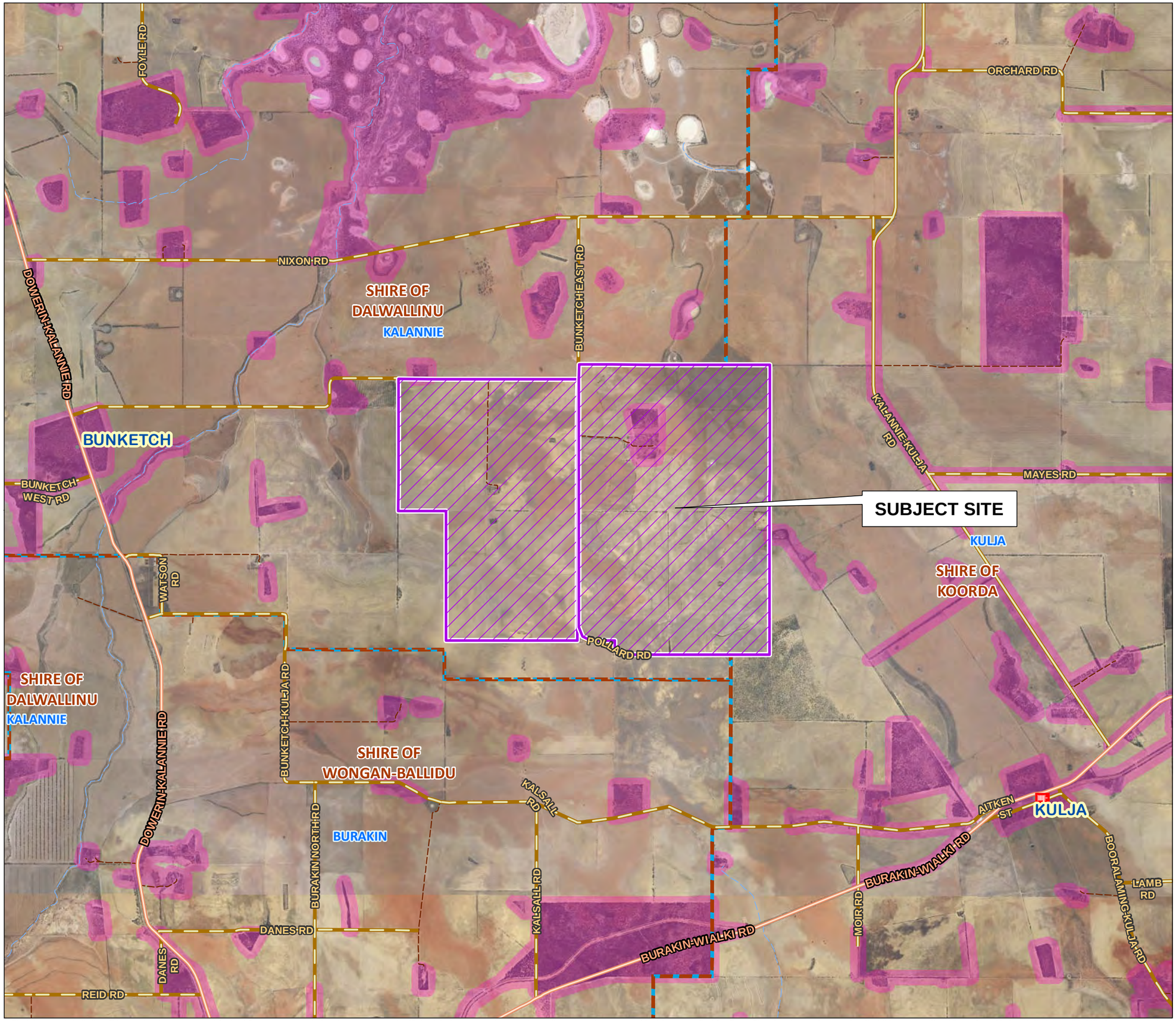
BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2022\220924 - Kalannie - Woodside (BMP) Contains All Info\Mapping\MXD\220924_Fig1-1_LOC_Kalannie_Woodside.mxd

Figure 1.2

Bushfire Prone Area

KALANNIE SITE (DRAFFINS)
KALANNIE
SHIRE OF DALWALLINU



------ LEGEND ------

- Subject Site
- Local Government Authority
- Locality / Suburb

Bush Fire Prone Areas

- Bushfire Prone Areas (2021)

0 0.5 1 1.5 2 2.5
Kilometres

------ LOCALITY ------

Aerial Imagery : Landgate/SLIP
Image Date : 2012

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 24/03/2023
Map updated by: Ian Ross 24/03/2023
A3 Scale 1:50,000

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2022\220924 - Kalannie - Woodside (BMP) Contains All Info\Mapping\MXD\220924_Fig1-2_BPA_Kalannie_Woodside.mxd

1.2 The Bushfire Management Plan (BMP)

1.2.1 Commissioning and Purpose

Landowner / proponent:	Woodside Energy Ltd Mia Yellagonga Karlak, 11 Mount Street Perth WA 6000
Bushfire Prone Planning commissioned to produce the BMP by:	Woodside Energy Ltd Mia Yellagonga Karlak, 11 Mount Street Perth WA 6000
Purpose of the BMP:	Development Application - To identify and subsequently implement the minimum standards responding to the local risk and local government requirements of the proposed re-vegetation (Plantation) area.
Local Govt. Area:	Shire of Dalwallinu

1.3 Bushfire Management Objectives

The main risk to the site assets (Plantation) is bushfire. Obligations for bushfire management arise from the *Bush Fires Act 1954 and* the Code of Practice for timber Plantations in Western Australia. The Act and Code place a responsibility on the landowner/plantation manager to:

- Protect life and property from bushfire;
- Minimise the spread of bushfire from the plantation land, and
- Protect surrounding properties, community interests and State forests from the damaging effects of bushfire.

In addition to these responsibilities, Local Governments have a statutory ability to consider the impact of plantations or large areas of re-vegetation with local species and implement provisions to ensure the safe management through their town planning scheme which may require additional considerations.

This Bushfire Management Plan describes the measures developed to implement bushfire management strategies on the land to meet its obligations and business priorities. The Plan provides the base framework for how the site manager/s intends to manage the accumulative fuel loads, firebreaks and access, water supplies for fire-fighting and respond to bushfire originating on or from an external impact to the site. It is not intended to repeat existing plans, policies or procedures, but to provide overarching guidance to the bushfire management arrangements. Included are strategies, and approaches to minimise the fire risks to the assets of value on the site and to neighbours and wider community.

The broad range of vegetation types, fire history, climate change, weather conducive to bushfire, unpredictability between years and seasons and local vegetation values across the local area mean that the risk posed by bushfire varies significantly therefore there is a requirement for a planned approach to site management.

The term "bushfire management" includes both fire prevention and fire suppression activities. It is recommended that a cooperative bushfire management and response arrangement is established between key fire authorities and forms part of the annual reviewing of the bushfire management planning for the site. These arrangements assist the site manager to manage fuel on their land and to adequately respond to and control bushfire where conditions are tenable to do so. It also facilitates high levels of support and coordination between the agencies to ensure sufficient resources to respond to escalating bushfire situations which are beyond the capability of the site manager or any one agency. It provides for a shared responsibility and ability to operate within an inter-agency coordinated system.

Any substantial loss of plantation resources has long term implications. In order to deliver bushfire protection to the greatest extent possible, the Woodside recognises that it needs to:

- Work collaboratively with local fire authorities to develop bushfire management and operations plans;
- Implement programs for bushfire prevention, mitigation, preparedness, response and recovery;
- Work cooperatively with local fire authorities to respond to bushfires to minimise the adverse impacts on human life, on social, economic and environmental values;

- Use fire under appropriate conditions to promote ecosystem health, diversity and resilience in native vegetation areas, and as a risk reduction strategy;
- Maintain appropriate levels of bushfire management capability to effectively discharge its responsibilities as Woodside (recognising that bushfire risk management is a responsibility of Woodside).

1.4 Environmental Considerations

Many bushfire prone areas also have high biodiversity values. Consideration of environmental priorities within the boundaries of the land being developed can avoid excessive or unnecessary modification or clearing of vegetation. Approval processes (and exemptions) apply at both Commonwealth and State levels.

Any 'modification' or 'clearing' of vegetation to reduce bushfire risk is considered 'clearing' under the *Environmental Protection Act 1986* (EP Act) and requires a clearing permit under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations) – unless for an exempt purpose.

Clearing native vegetation is an offence, unless done under a clearing permit or the clearing is for an exempt purpose. Exemptions are contained in the EP Act or are prescribed in the Clearing Regulations (note: these do not apply in environmentally sensitive areas).

The *Department of Water and Environmental Regulation* (DWER) is responsible for issuing 'clearing' permits and the framework for the regulation of clearing. Approvals under other legislation, from other agencies, may also be required, dependent on the type of flora or fauna present.

Local Planning Policy or Local Biodiversity Strategy: Natural areas that are not protected by the above Act and Regulations (or any other National or State Acts) may be protected by a local planning policy or local biodiversity strategy. Permission from the local government will be required for any modification or removal of native vegetation in these Local Natural Areas (LNA's). Refer to the relevant local government for detail.

For further Information refer to Guidelines v1.4, the Bushfire and Vegetation Factsheet - WAPC, Dec 2021 and https://www.der.wa.gov.au/our-work/clearing-permits

Woodside are to adopt principles of environmental care when planning and conducting bushfire management activities in line with the following:

- Protect water quality and quantity by implementing measures designed to minimise the impact of bushfire on swampy ground and bodies of standing water, and their physical, chemical, and biological qualities;
- Protect soil to maintain its physical and chemical properties and promote stabilisation of bare or disturbed earth;
- Consider landscape values, geomorphologic features, and cultural and historical sites when planning operations;
- Protect indigenous flora and fauna following bushfire suppression by measures which promote the re-establishment of the ecological processes existing prior to the bushfire;
- Avoid the possible introduction and spread of pest plants and animals, plant diseases, and insect pests;
- Address air quality by measures which diminish the impacts of smoke generated by prescribed burning;
- Maintain the dynamism and diversity in WA's indigenous flora and fauna species populations and communities through use of appropriate fire regimes and bushfire management activities.

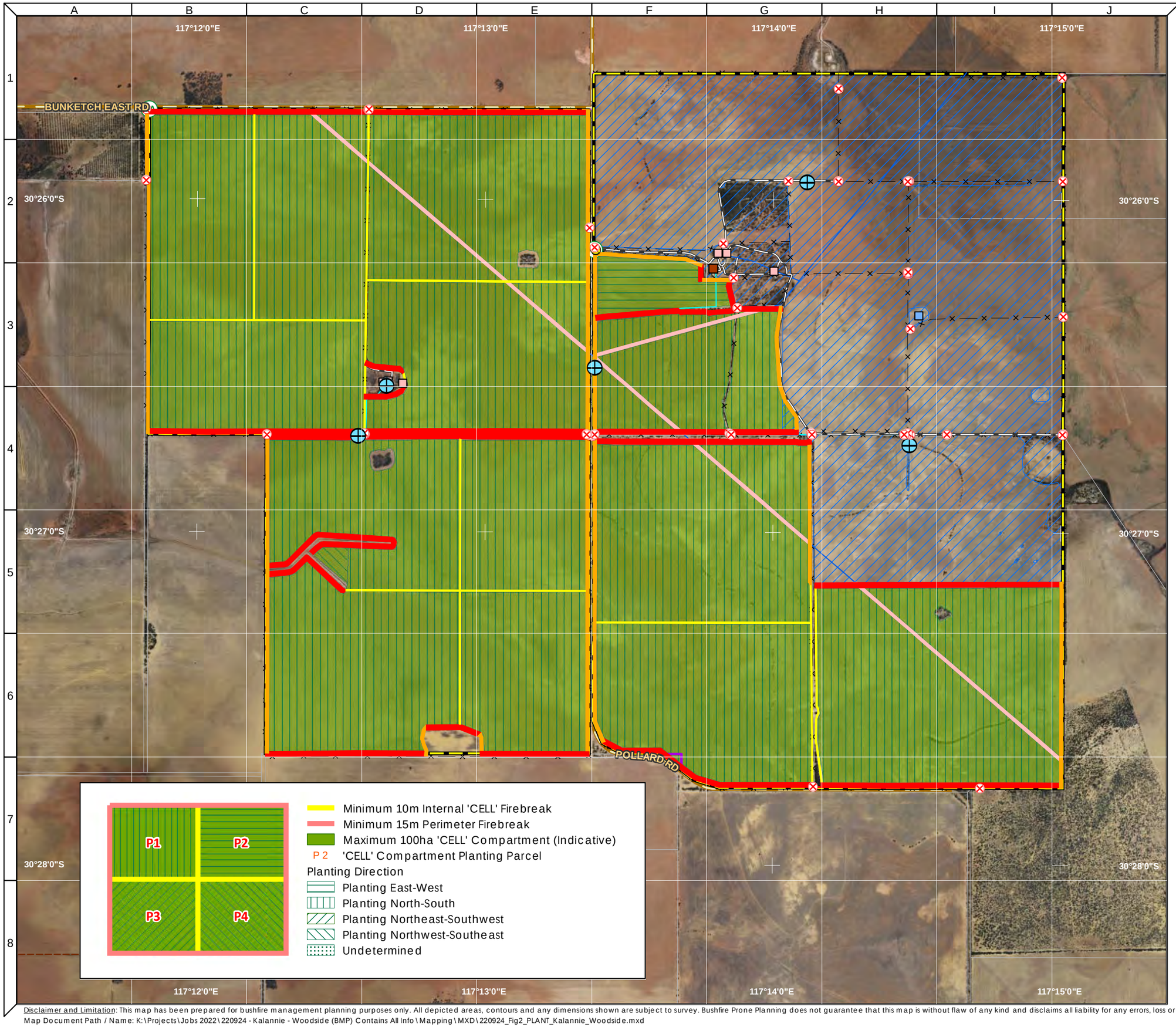


Figure 2.0

Indicative Planting Cells, Limited to Areas Under 100 ha

KALANNIE SITE (DRAFFINS)

KALANNIE
SHIRE OF DALWALLINU

------ LEGEND ------

- Subject Site
- Other Lots
- Indicative Cells to be Confirmed in Final Planting Plan Detail

Proposed Firebreaks

- Firebreak 10m wide
- Firebreak 15m wide
- Firebreak 20m wide
- Firebreak 30m wide
- Draffins no planting selling land

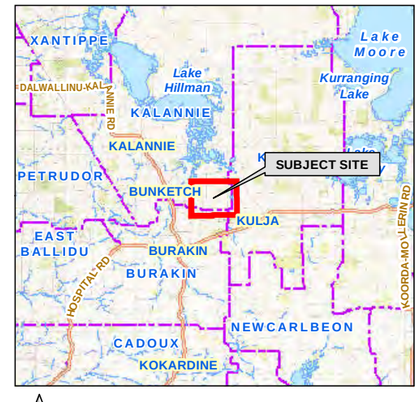
Infrastructure

- Access Gate
- Dam Centre
- House
- Main Access Gate
- Shed
- Water Tank
- Draffins muster points
- Access and fire tracks
- Fence Line
- Firebreak 5m external
- Overhead powerline
- Underground water pipe

Total planting area approx 1840 ha

0 200 400 600 800 1,000
Metres

------ LOCALITY ------



Aerial Imagery : Landgate/SLIP
Image Date : 2012

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 29/03/2023
Map updated by: Ian Ross 29/03/2023
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BUSHFIRE PRONE PLANNING

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1.5 Risk Management (basic)

Woodside are to adopt a risk management approach throughout its plantation maintenance programs and bushfire operations. The main risk categories for bushfire management considerations are described below.

1.5.1 People

Bushfire presents risks to the health, safety and welfare of staff, contractors and visitors to the site. Fire and associated smoke can also impact the local community and neighbours. Woodside may also develop partnerships with traditional aboriginal custodians to insure the maintenance and protection of their culture and values.

1.5.2 Resources

Maintain bushfire management resources according to that defined in 'future' site Pre-Incident Plans and Preparedness Guidelines (which are formulated around daily Australian Fire Danger Ratings - AFDR).

1.5.3 Air quality

Bushfire can have a significant impact on air quality causing detrimental impacts on major population centers, airports, major roads, neighbours and other sensitive areas.

Planning and risk analysis are to be undertaken for each prescribed burn to determine the comparative risk of smoke impacts from burns on the local community and air quality with the risks to public safety and natural assets from potential bushfire. Information on weather, fire behaviour, smoke trajectory predictions, burn location and size of the area to be fuel reduced are of strategic importance in determining the most suitable burn prescription and ignition application to achieve an effective burn outcome with low smoke impacts.

1.5.5 Water quality

Planning and operations are to be assessed by risk to minimise the impact on water quality, and reduce risks associated with increased chance of sedimentation.

1.5.6 Habitat modification

Habitat modification includes destruction of ground cover and subsequent accelerated erosion (land degradation), changes in ground cover species composition (perennial grasses to annual weeds), physical modification of stream profiles and water quality and physical destruction of individual plants.

1.5.7 Soil quality

Bushfire can lead to increased erosion through the removal of ground cover.

Prescribed burn planning must consider the impacts of fire on soils and aim to deliver mosaic burn patterns that maintain soil cover while at the same time reducing fuel loads. Plantation operations and earthworks are to be undertaken in accordance with strict "best practice guidelines" to ensure soil quality is not degraded. Post fire recovery operations should also be undertaken to insure soil stability.

1.5.8 Commercial imperatives

One of the greatest risks to the plantation for carbon stores is the impact of unplanned bushfire. The loss of significant areas of plantation or native forest regrowth ultimately impacts the ability to meet the carbon store commitments.

The Plantation which is intended to incorporate local native species is susceptible to bushfire, particularly at regular intervals. History shows a tolerance to mild fire once native vegetation is established. However, when not killed outright, fire can damage plantation trees or greatly reduce growth rates. Whilst it may still be possible to recover plantation cell areas, it will be at a much-reduced carbon offset value until fully established again. There is a significant loss of resource and time to re-establish these areas if they are impacted by bushfire.

1.6 Safety

Safety is a key driver in the management of the plantation site. Keeping 'our' people safe and ensuring that they get home safely to their families at the end of each day is a priority.

Woodside must:

- Ensure the safety of all firefighting and support personnel is given the highest priority in the planning and application of all fire management operations;
- Review and apply standards for the medical and physical fitness requirements of all fire management personnel in accordance with best practice information and experience as set out for the workplace.

Guidelines for Managing the staff tasked with bushfire responsibilities:

- Make available critical incident stress debriefing to personnel subjected to traumatic events or circumstances;
- Give staff sufficient time to rest to relieve fatigue and stress arising from their involvement in bushfire suppression operations as far as is reasonably practical;
- Random drug and alcohol testing can be undertaken at any time and at any part of the workplace, including on the fire ground, as per the alcohol and drug policy for the site.

The following initiatives and procedures are suggested to further enhance and promote the safety of all staff working at the plantation site.

1.6.1 Fitness for fire-fighting

It is recommended that Plantation staff involved in fire-fighting activities including planned/prescribed burning programs and bushfire management measures should undertake a fitness assessment to ensure they are fit for task.

Fire operational staff should be required to undertake further medical checks annually or as recommended by a medical practitioner.

1.6.2 Personal Protective Equipment (PPE)/Personal Protective Clothing (PPC)

All plantation staff involved in fire prevention and fire operations are to be supplied with, and expected to wear or carry, standard firefighting PPE/ PPC. PPE/ PPC is to meet Australian Standards and it is the responsibility of the wearer to ensure it is maintained and worn or carried in accordance with plantation policy and protocols.

1.6.3 Standard Operating Procedures and Guidelines

Fire related Standard Operating Procedures and Guidelines are to be developed and updated as required.

All firefighting staff are expected to be aware of and abide by these SOPs and Guidelines.

1.6.4 Very High Hazard Areas

The safety of firefighters is always paramount in firefighting operations, and dangerous areas within the site must be identified and included on the response/site plan for the plantation.

1.6.5 Fatigue Management

Fatigue management guidelines apply within the Plantation site for management teams and staff accordingly. Woodside should implement a procedure for managing staff fatigue during bushfire operations.

1.6.6 Vehicles and Driving

The location of the plantation and operations means that staff are likely required to drive long distances as part of their workday. Driving is considered one of the highest critical risks. This is exacerbated in fire management because of the work environment, which can include night-time operations and extended periods of work. Woodside are to limit this risk by enforcing fatigue management guidelines, monitoring vehicle movements and safe driving practice. Staff are to be regularly reminded of the risks and controls to minimize accidents and incidents associated with driving.

1.6.7 Capability

Woodside are to ensure capability for bushfire response within the plantation site to be defined and established in accordance with the Woodside risk-based approach. The approach should incorporate a daily readiness and preparedness which is informed by the fire danger rating (AFDR) and levels of fire activity in the surrounding areas on any given day. Preparedness should include:

- A pre-incident readiness for the bushfire season, which considers resources and procedures for daily activities and requirements for fire preparedness and response or to assist local bushfire brigades with bushfire operations such as 'mop up';
- Hazardous fuel load mitigation works, revised annually, with scheduled mitigation activities that reduce the risk of bushfire or support operational activities in terms of ability to respond effectively to extinguishment of bushfire.

The Woodside Farm Manager and two assistant farm managers are members in the local volunteer bush fire brigades and maintain communication with local brigades on local bushfire issues. Fire fighting capabilities include equipment on the property, water available for fire fighting activities at strategic locations near roadways and central to the plantings, maintained accessways, maps at key entrances for fire and equipment information on the property.

1.6.8 Staff

Capability requirements for the plantation site should define the number of fire operations and support staff that are necessary to undertake programed mitigation works and provide assistance at fires on site at any given time. Woodside staff are expected to be bushfire trained where required to respond directly or to support the firefighting effort in other ways. Seasonal staff may also be employed to supplement firefighting capacity to meet the seasonal operational requirement numbers.

It is recommended that Staff are to be trained in a range of competencies to enable plantation resources to assist with the management of fires, with roles ranging from on ground basic fire fighters through to senior management roles. Once fires go beyond Woodside capability, local government and DFES resources are likely to take over operational control of an incident.

1.6.9 Training

Bushfire training is an essential component of safe, efficient and effective fire management operations. Woodside are to:

- Apply national standards as the basis of competency definition, or where these do not exist, accepted industry standards;
- Define competency requirements;
- Review the competencies of personnel according to established currency requirements;
- Provide and/or facilitate training programs and competency assessments for skills acquisition, maintenance and personal and professional development to ensure personnel have the required competencies.
- Maintain systems to record training and competency for all fire management activities.

Training requirements and review/expiry dates are to be tracked and monitored through an appropriate system for all operational Plantation firefighting staff.

1.7 Equipment

Woodside has a legal responsibility to prevent fire from escaping their land in accordance with the Bush Fire Act 1954. It must be possible for Woodside to attend a bushfire on their site.

As a minimum for the plantation site, Woodside is to ensure 2 x suitably constructed 4WD vehicle mounted 'slip-on' units and 1 x trailer mounted fire pump/water tank unit, to ensure sufficient mobile water capacities and fire-fighting ability, is available for responding to bushfire within the plantation site boundaries. This equipment will be on-site whilst Woodside staff/workers during the bushfire season or where on-site activities are conducive to bushfire.

1.7.1 Fire Appliances and Machinery

The Plantation should have access to, owns, or contracts light and heavy machinery that can be used in firefighting. Additional Heavy plant such as front-end loaders (FEL) may be specifically stood-up and ready for deployment, particularly during periods of increased fire danger.

Heavy plant to be fit for purpose, that is Roll Over Protection (ROP's), Falling Object Protection (FOP's) and (OPG) Operator Protection Guarding compliant, which meets the relevant Australian or International Standard. Staff (Heavy Plant Operators) must be trained and highly experienced in operating and supervising heavy plant. To the greatest extent possible, Woodside should always provide a heavy Plant Supervisor (machine supervisor) to direct and work with heavy plant on the fire ground to ensure communications with the plant operator and to also provide fire protection for plant working on fire lines.

- Firefighting equipment must be in good working order and well maintained;
- All machinery is to be fitted with approved, serviceable fire extinguisher in line with Australian Standards (This is a requirements of the Bush Fires Act 1954 and Bush Fires Regulations 1954);
- Refueling of machinery and equipment will not occur in the planted area. Refueling must be undertaken on a hardstand area, free from flammable material;
- Vehicles and machinery operating in the plantation during the bushfire season must comply with the Bush Fires Act 1954 and must adhere to the requirements of Harvest and Vehicle Movement Bans and Total Fire Bans when set by the Local Government and/or Fire and Emergency Services Commissioner.

<u>Radio Communications and Technology:</u>

Woodside to maintain its own radio network which can be used extensively in bushfire control and daily operational requirements. Liaison with local fire agencies is required to develop a range of measures to ensure that during a bushfire incident plantation staff can communicate with other agencies to ensure inter-operability.

Procedures relating to appropriate radio installation, upkeep and maintenance are to be developed.

1.8 Bushfire Management Program

Woodside to use the "Prevention, Preparedness, Response, Recovery model" as a framework for delivery of its bushfire management planning and programs.

1.8.1 Bushfire Prevention

Woodside to work cooperatively with Department of Biodiversity, Conservation and Attractions (DCBA), Department of Fire and Emergency Service (DFES), local government authorities and other stakeholders on programs to prevent the occurrence of unplanned fires.

Measures for bushfire prevention are determined and implemented at a Management Area/Plantation Protection Area level. Measures applied are:

- Compliance with the Shire of Dalwallinu Firebreak and Fuel Hazard Reduction Notice (Firebreak Notice) and DEFS declared Total Fire Ban days to prevent ignition by machinery and enforce fire use restrictions to reduce accidental ignition.
- Systems for ceasing plantation operations during extreme fire weather to reduce accidental ignitions.
- Surveillance of selected areas of the site to stop/regulate access into the plantation or other areas of the property during adverse conditions.
- Undertaking fuel reduction prescribed burning programs.

1.8.2 Planning and Preparedness

Woodside should aim to undertake fire prevention and preparedness activities in a planned and cohesive manner, delivering the best possible level of bushfire protection, as required by legislation, while simultaneously maximising ecological and other land management outcomes.

Measures applied are:

- Annual pre-readiness for the bushfire season, fire suppression strategies and priorities, and
- Annual hazardous fuel mitigation works, to mitigate the risk of bushfires on its managed land.

This provides for a consistent and cohesive approach for both suppression and fuel management activities.

Management activities must:

- Include an assessment of risk to life and property, economic risk to commercial assets, and risks to rare and threatened species and communities
- Describe the priorities for fire protection works for a five-year period.

1.8.3 Pre-Incident Plans

Prior to fire season commencement each year, pre-incident preparedness is undertaken, to ensure effective response to bushfires on the site. Levels of preparedness and defined numbers of personnel and equipment required for initial attack are determined in accordance to predicted fire danger rating. (Refer Appendix 'L').

Pre-incident preparedness is to consider the following information:

- Fire preparedness guidelines and fire danger information (AFDR);
- Response arrangements (communication with local brigades and the local government);
- Local emergency services (volunteer bush fire brigades) contact information;
- Links to weather information;
- Reviewed annually any recommendations or current strategies, prior to the commencement of the fire season.

1.8.4 Hazardous Fuel Management

Hazardous Fuel Management considers the range of fire protection strategies and practices available and adopts those which best meet both fire protection objectives and the principles of environmental management. These may include use of fire in a controlled environment.

- At an overall property scale, excluding the use of fire to sensitive areas on site;
- A tool to achieve ecological outcomes by altering habitat structure and composition of flora and fauna species;
- To protect or enhance water catchment on the site, historical, Indigenous and other cultural values;
- Accommodating fire protection objectives outlined in the Shire of Dandaragan Fuel Hazard Reduction Notice and Shire of Moora Firebreak Notice.

Hazardous Fuel Management should consider rolling targets for seasonal prescribed burning subject to weather conditions or seasonal mechanical methods of hazardous fuel reduction areas within the site, including weed management by slashing, ploughing or other environmentally approved technique.

Fuel Management Plan components:

Geographical Information System Mapping (GIS)

- GIS allows analysis of spatial information such as the planning area, fire history, built, natural and cultural assets and values.
- Layers can be periodically reviewed and updated to incorporate new data and fire history or site detail as required.
- Map layers are to be stored in the Corporate GIS database.

Each Plantation Area to have a series of Risk Based Maps which identify the following:

Assets at risk

- This map identifies fire-vulnerable asset location.
- Settlements/townships adjoining State Forest.
- Plantations high value young regrowth areas.
- Land tenure boundaries.
- Credible high-intensity fire paths to plantation areas and fire-vulnerable assets on site.

Hazard reduction constraints

- Identify areas that are hazard reduction treatable and non-treatable land/ vegetation type map.
- Non-burnable area categories.
- Land excluded from prescribed burning by environmental regulations.
- Plantation high value young regrowth areas.
- Fire sensitive area types in which mechanical fuel reduction is preferred to burning as a fuel management treatment *(Note: Grazing may also be a suitable option)*.
- Land NOT tenable for hazard reduction burning due to operational constraints (neighbour fencing/assets not feasible to protect, no reliable burn boundaries, access issues etc.).

1.8.5 Prescribed Burn Plans

This bushfire management plan is an explanation of the measures that will be undertaken to ensure carbon remains sequestered in the project area. The plan includes management actions that have or will be undertaken to prevent the risk of fire starting and spreading within the project areas, including the frequency and scale of these actions. The management of accumulative fuel loads to reduce the intensity and spread of fires includes hazard reduction burning (prescribed/planned burning). Ensuring managed burning will have a far lower impact on the site over the life of the project than an uncontrolled bushfire. All prescribed burns will have an approved operational plan prior to burning. Safety and environmental considerations and potential impacts on other stakeholders are assessed as part of the planning process (due diligence).

Operational plans include:

- Burn objectives
- An operational map
- Environmental approvals
- Burn area details
- Resources required
- Standards to be met
- Checks and notifications to be undertaken
- Authorisations to be obtained and
- Post burn appraisals to be conducted.

Operational Plans for prescribed burning remain current for 5 years but should be reviewed prior to each planned burn.

1.8.6 Approving Prescribed Burn Plans

All site-specific burn plans must be approved by Woodside designated officer, or their delegate, and all burns must be authorized prior to commencement of burning. All prescribed burning to be undertaken in accordance with State Legislation and Local Government requirements pursuant to provisions of the Bush Fires Act 1954.

1.8.7 Bushfire

Details for each individual bushfire including situation reports, communication, mapping, photos, video, documents, predictions, and Incident Action Plans (IAP) should be developed and archived.

All detail including logs, maps and planning should be captured and stored in case it needs to be produced later, where appropriate.

1.8.7 Bushfire Recovery

Undertake or assist other agencies to undertake recovery activities of bushfire affected areas on site in reconstruction of the physical infrastructure and restoration of plantation areas.

Other bushfire recovery actions may include operations to salvage, repair, rehabilitate or replace fire damaged assets and sites disturbed by fire control operations.

All recovery operations and actions post bushfire should be carried out in accordance with an Incident Action Plan for the bushfire.

Further significant recovery operations may include salvage operations for recoverable vegetation and replanting of plantation or silvicultural operations to facilitate regeneration.

1.8.7 Rehabilitation

Undertake rehabilitation of disturbance resulting from firefighting operations as soon as practical after the bushfire is contained. Where substantial rehabilitation works are or will be required, a rehabilitation plan is prepared and implemented. In some circumstances, the bushfire may be declared a natural disaster and funding for rehabilitation and recovery works may be available under the Natural Disasters Recovery Fund. Where possible, rehabilitation activities such as erosion control measures should be undertaken in conjunction with control activities.

1.8.8 Enforcement

Where there is sufficient evidence to suggest that a person (or persons) was responsible for deliberately lighting or negligently causing a fire on the site or a fire that subsequently enters onto plantation managed areas, this must be reported to the relevant authorities, DFES and WA Police. Action may be taken to recover the costs of suppression and/or damage caused by the fire.

1.9 Data capture, monitoring and reporting

1.9.1 Currency and competency

Staff who participate in fire related operational activities including both bushfire and prescribed burning should log the details of their hours and operational roles in an appropriate system. This enables capture of activity for maintenance of currency and competency against fire qualifications.

1.9.2 Post Incident and End-Of-Season Debriefs and Reports

Major fire suppression events undertaken by Plantation staff may be subject to a post incident debrief.

End of season debriefs are also undertaken and actions or "lessons learnt" identified and addressed in training, procedure review and/or development or communicated out to all firefighting staff.

The format and scope of the post incident debrief depends on the incident level and the nature of events during the incident. The style of debriefing can range from an informal discussion between plantation manager and staff on a small incident, to a formal debriefing on a complex incident.

1.9.3 Monitoring and Recording

All data, such as fire histories, prescribed burning and results of management programs to be recorded on a regular basis to update GIS layers and to inform annual planning and reporting.

Requirements for additional records or reporting, such as a fire investigation, planning developments, training and Quality Assurance Audits/Operational Inspection Reports will be maintained in a format that complies with the Woodside Records Management Policy.

Evidence to support any claims must be kept ensuring these records provide details of land management actions with respect to activities that reduce bushfire risk on the site. This might include copies of prescribed burn permits, date stamped photos of fire hazard reduction activities or receipts from service providers.

Figure 3.1

Classified Vegetation & Topography

KALANNIE SITE (DRAFFINS)

KALANNIE
SHIRE OF DALWALLINU

------ LEGEND ------

- Subject Site
- Photo & Direction
- Draffins no planting selling land

150m Vegetation Assessment Area

- 150m from Subject Site

Classified Vegetation

- Class (D) Scrub
- Class (G) Grassland
- Exempt 2.2.3.2

Infrastructure

- Access Gate
- Dam Centre
- House
- Main Access Gate
- Shed
- Water Tank
- New Water Tank
- Draffins muster points
- Access and fire tracks
- Fence Line
- Firebreak 5m external
- Overhead powerline
- Underground water pipe

0 200 400 600 800 1,000
Metres

------ LOCALITY ------

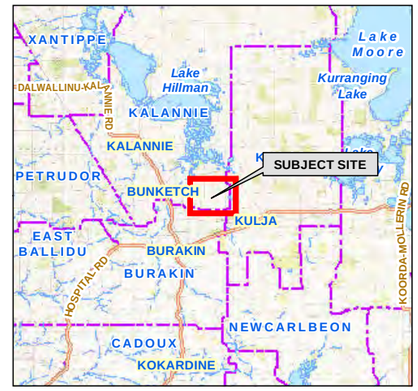

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Image Date : 2012

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Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 29/03/2023
Map updated by: Ian Ross 29/03/2023
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BUSHFIRE PRONE PLANNING

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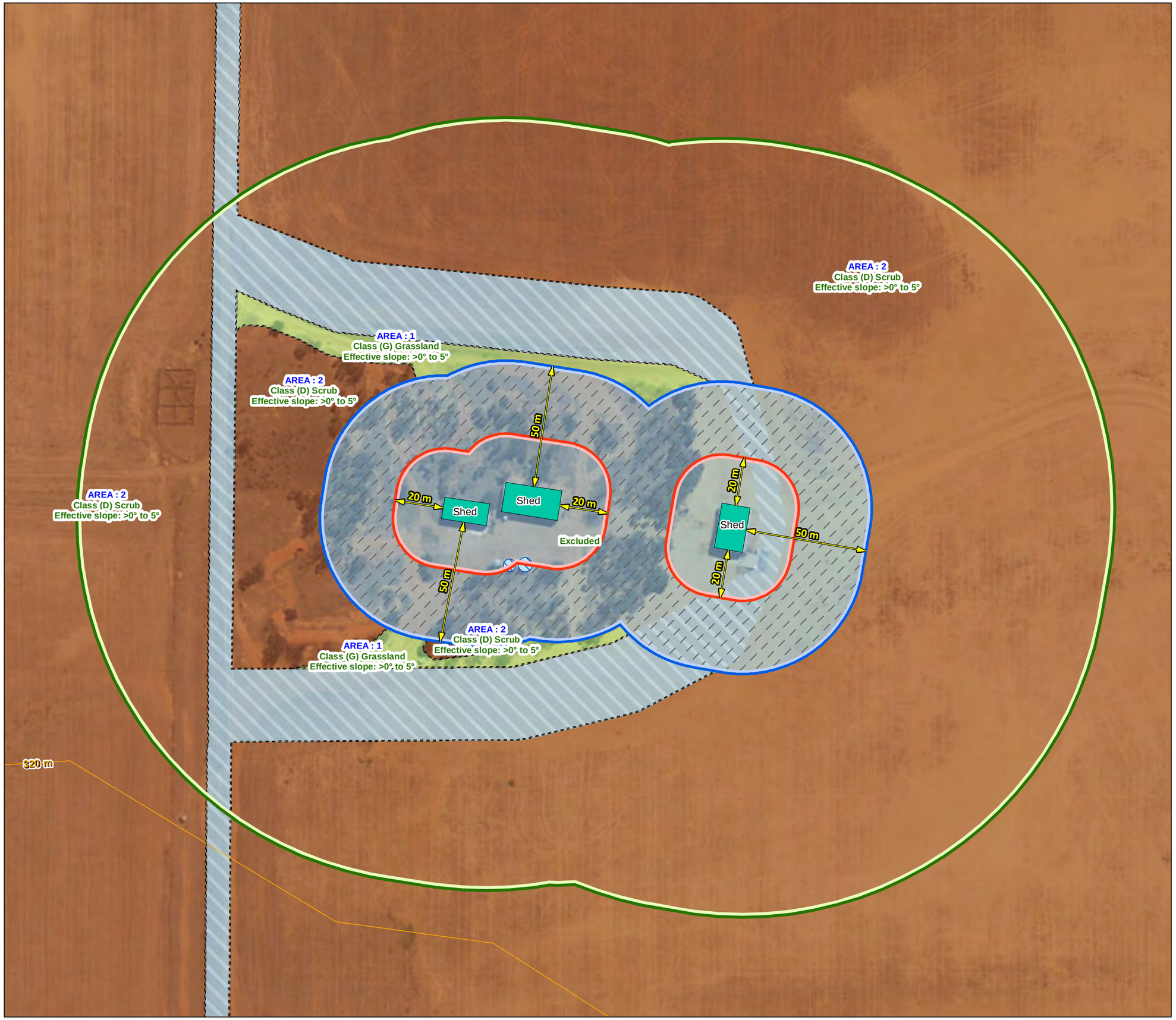
Figure 3.2.1

BAL Contour Map
Central Building Group

KALANNIE SITE (DRAFFINS)

KALANNIE
SHIRE OF DALWALLINU



------ LEGEND ------

Existing Building
- Shed
- Water Tank

150m Vegetation Assessment Area
- 150m from Subject Site

Vegetation Management
- Low Fuel Zone <8ta/ha

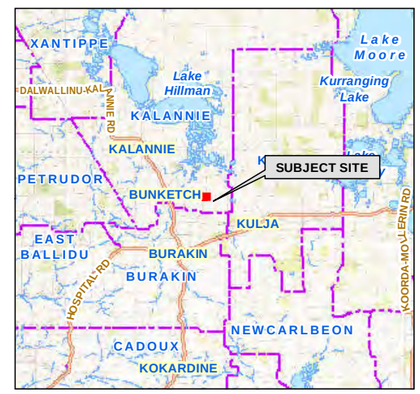
Asset Protection
- 50m Plantation HSZ
- Indicative 20m APZ

Classified Vegetation
- Class (D) Scrub
- Class (G) Grassland
- Exempt 2.2.3.2

APZ Distance

0 20 40 60 80 100
Metres

------ LOCALITY ------



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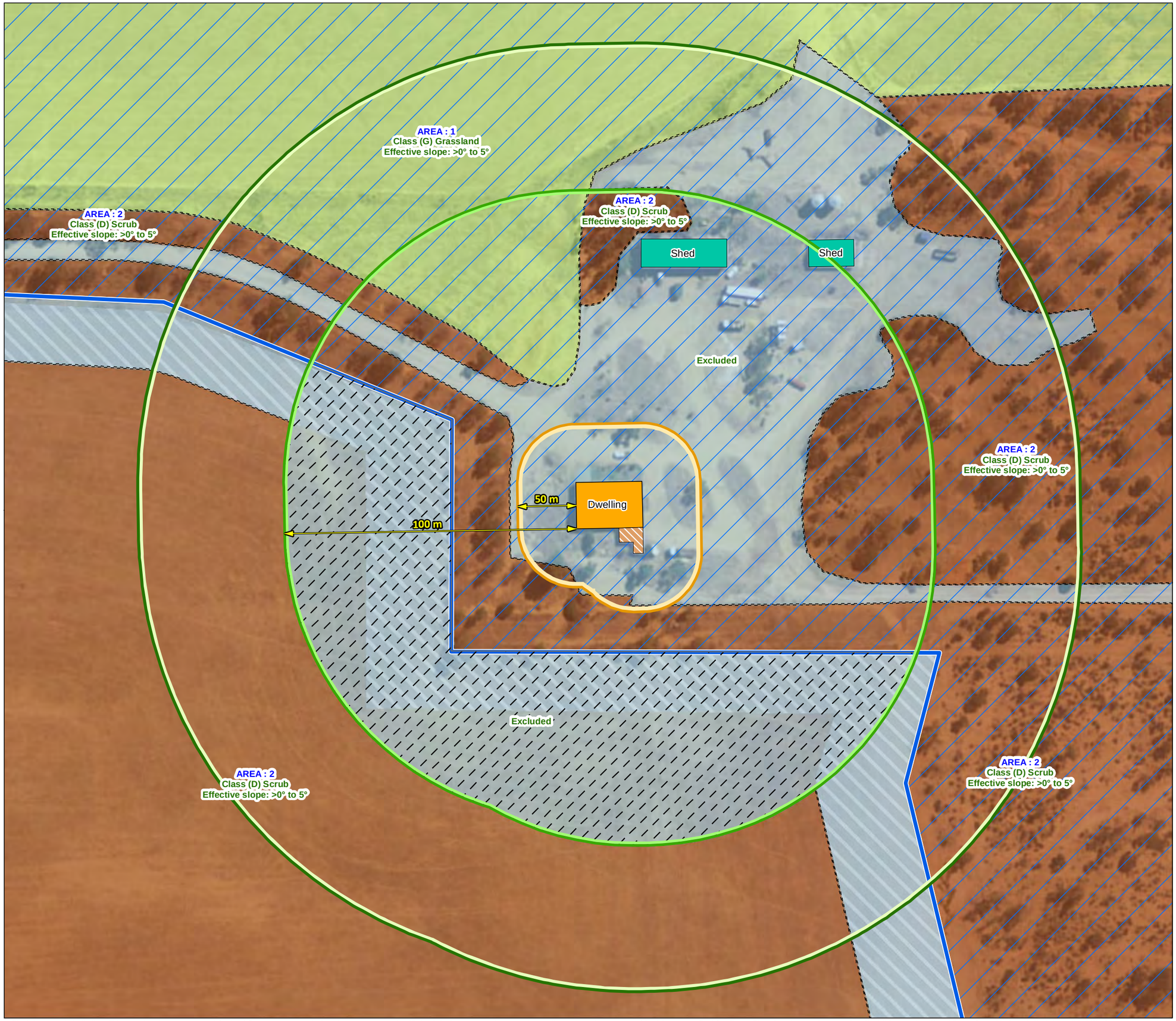


Figure 3.2.2

BAL Contour Map
House in Future Adjacent Lot

KALANNIE SITE (DRAFFINS)
KALANNIE
SHIRE OF DALWALLINU

------ LEGEND ------

Existing Building
- Dwelling
- Carport
- Shed
- Future Adjacent Lot

150m Vegetation Assessment Area
- 150m from Subject Site

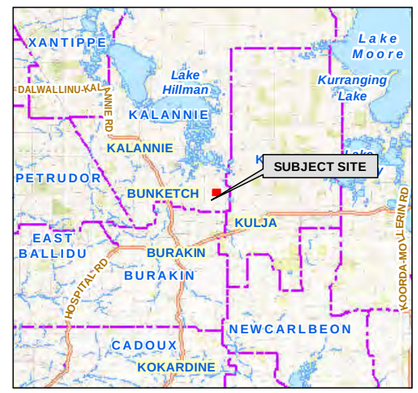
Vegetation Management
- Low Fuel Zone <8ta/ha

Asset Protection
- 100m Plantation HSZ
- Indicative BAL-29 APZ

Classified Vegetation
- Class (D) Scrub
- Class (G) Grassland
- Exempt 2.2.3.2
- APZ Distance

0 20 40 60 80
Metres

------ LOCALITY ------



Aerial Imagery : Landgate/SLIP
Image Date : 2012

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 29/03/2023
Map updated by: Ian Ross 29/03/2023
A3 Scale 1:1,250

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2022\220924 - Kalannie - Woodside (BMP) Contains All Info\Mapping\MXD\220924_Fig3-2-2_BAL_EAST_Kalannie_Woodside.mxd

1.10 Vegetation Assessment and Classification

Vegetation Types and Classification

In accordance with AS 3959:2018 clauses 2.2.3 and C2.2.3.1, all vegetation types within 100 metres of the 'site' (defined as "the part of the allotment of land on which a building stands or is to be erected"), are identified and classified. Any vegetation more than 100 metres from the site that has influenced the classification of vegetation within 100 metres of the site, is identified and noted. The maximum excess distance is established by AS 3959: 2018 cl 2.2.3.2 and is an additional 100 metres.

Classification is also guided by the Visual Guide for Bushfire Risk Assessment in WA (WA Department of Planning February 2016) and any relevant FPA Australia practice notes.

Modified Vegetation

The vegetation types have been assessed as they will be in their natural mature states, rather than what might be observed on the day. Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its expected re-generated mature state. Modified areas of vegetation can be excluded from classification if they consist of low threat vegetation managed in a minimal fuel condition, satisfying AS 3959:2018 s2.2.3.2(f), and there is sufficient justification to reasonable expect that this modified state will exist in perpetuity.

The Influence of Ground Slope

Where significant variation in effective slope exists under a consistent vegetation type, these will be delineated as separate vegetation areas to account for the difference in potential bushfire behaviour, in accordance with AS 3959:2018 clauses 2.2.5 and C2.2.5.

THE INFLUENCE OF VEGETATION GREATER THAN 100 METRES FROM THE SUBJECT SITE	
Vegetation area(s) within 100m of the site whose classification has been influenced by the existence of bushfire prone vegetation from 100m – 200m from the site:	None
Assessment Statement:	No vegetation types exist close enough, or to a sufficient extent, within the relevant area to influence classification of vegetation within 100 metres of the subject site.

VEGETATION AREA 1						
Classification (Existing)	G. GRASSLAND		Classification (Post-Development)		D. SCRUB	
Types Identified	Sown pasture G-26 Tussock grassland G-22					
Effective Slope	Measured	~1.0 degree	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	<10%	Shrub/Heath Height	N/A	Tree Height	N/A	
Additional Justification:	Large areas of gently undulating grass and cropping land with sparse trees.					
Post Development Assumptions:	Vegetation is onsite (Photo ID:1 future land for sale – offsite vegetation post sale) and will have some degree of fuel load management in Cells (<100ha) by the subject site landowner. Land will be re-vegetated with native local species. Planting densities and species constitute a 'Scrub' vegetation for the Cells outside of existing Scrub areas. Class G Grassland will be revegetated into Class D Scrub mix, and therefore classification on worst case scenario must be applied to the revegetated condition.					

PHOTO ID: 1

PHOTO ID: 2

PHOTO ID: 3

PHOTO ID: 4

VEGETATION AREA 1							
Classification (Existing)	G. GRASSLAND			Classification (Post-Development)	D. SCRUB		
Types Identified	Sown pasture G-26 Tussock grassland G-22						
Effective Slope	Measured	~1.0 degree		Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	<10%	Shrub/Heath Height	N/A	Tree Height	N/A		
Additional Justification:	Large areas of gently undulating grass and cropping land with sparse trees.						
Post Development Assumptions:	Vegetation is onsite (Photo ID: 8 future land for sale – offsite vegetation post sale LHS of photo, classified as grassland in its current condition) and will have some degree of fuel load management in Cells (<100ha) by the subject site landowner. Land will be re-vegetated with native local species. Planting densities and species constitute a 'Scrub' vegetation for the Cells outside of existing Scrub areas. Class G Grassland will be revegetated into Class D Scrub mix, and therefore classification on worst case scenario must be applied to the revegetated condition.						

PHOTO ID: 5

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PHOTO ID: 8

VEGETATION AREA 1							
Classification (Existing)	G. GRASSLAND		Classification (Post-Development)		G. GRASSLAND		
Types Identified	Sown pasture G-26	Tussock grassland G-22		Sparse open tussock G-24			
Effective Slope	Measured	1.0 degree	Applied Range (Method 1)		Downslope >0-5 degrees		
Foliage Cover (all layers)	<10%	Shrub/Heath Height	N/A	Tree Height	N/A		
Additional Justification:	Large areas of gently undulating grass and cropping land with sparse trees. Areas of grass/crops patchy and sandy.						
Post Development Assumptions:	Vegetation is off-site and not under the control of the landowner. Classified as grassland in its current condition.						

PHOTO ID: 9

PHOTO ID: 10

PHOTO ID: 11

PHOTO ID: 12

<table>
<tr><th colspan="8">VEGETATION AREA 1</th></tr>
<tr><td>Classification (Existing)</td><td colspan="2">G. GRASSLAND</td><td colspan="2">Classification (Post-Development)</td><td colspan="3">G. GRASSLAND</td></tr>
<tr><td>Types Identified</td><td colspan="7">Tussock grassland G-22 Sown pasture G-26</td></tr>
<tr><td>Effective Slope</td><td colspan="2">Measured</td><td>~1.0</td><td colspan="2">Applied Range (Method 1)</td><td colspan="2">Downslope >0-5 degrees</td></tr>
<tr><td colspan="2">Foliage Cover (all layers)</td><td><10%</td><td>Shrub/Heath Height</td><td>N/A</td><td>Tree Height</td><td colspan="2">N/A</td></tr>
<tr><td colspan="2">Additional Justification:</td><td colspan="6">Large areas of gently undulating grass and cropping land with patchy/sandy areas.</td></tr>
<tr><td colspan="2">Post Development Assumptions:</td><td colspan="6">Vegetation is off-site and not under the control of the landowner. Classified as grassland in its current condition.</td></tr>
<tr><td colspan="4"> 
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</td></tr>
<tr><td colspan="4">PHOTO ID: 13</td><td colspan="4">PHOTO ID: 14</td></tr>
</table>

VEGETATION AREA 2						
Classification (Existing)	D. SCRUB		Classification (Post-Development)		D. SCRUB	
Types Identified	Open scrub D-14	Tussock grassland G-22		Low shrubland C-12		
Effective Slope	Measured	~1.0 degree	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 4m	
Additional Justification:	Mixed species scrub composition Eucalypts. Understory of unmanaged grass in areas of undulating land.					
Post Development Assumptions:	Classified as Scrub as these areas are not identified as changing in land use or further reforestation. (On-site strips and pockets of scrub and off-site verge vegetation).					

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<table>
<tr><th colspan="8">VEGETATION AREA 2</th></tr>
<tr><td>Classification (Existing)</td><td colspan="2">D. SCRUB</td><td colspan="2">Classification (Post-Development)</td><td colspan="3">D. SCRUB</td></tr>
<tr><td>Types Identified</td><td colspan="7">Open scrub D-14 Tussock grassland G-22 Low shrubland C-12</td></tr>
<tr><td>Effective Slope</td><td colspan="2">Measured</td><td>~1.0 degree</td><td colspan="2">Applied Range (Method 1)</td><td colspan="2">Downslope >0-5 degrees</td></tr>
<tr><td colspan="2">Foliage Cover (all layers)</td><td>>30%</td><td>Shrub/Heath Height</td><td>1-2m</td><td>Tree Height</td><td colspan="2">Up to 4m</td></tr>
<tr><td colspan="2">Additional Justification:</td><td colspan="6">Mixed species scrub composition Eucalypts. Understory of unmanaged grass in areas of undulating land.</td></tr>
<tr><td colspan="2">Post Development Assumptions:</td><td colspan="6">Classified as Scrub as these areas are not identified as changing in land use or further reforestation. (On-site vegetation in proximity to existing sheds and water tanks).</td></tr>
<tr><td colspan="4"> 
</td><td colspan="4"> 
</td></tr>
<tr><td colspan="4">PHOTO ID: 20</td><td colspan="4">PHOTO ID: 21</td></tr>
</table>

VEGETATION AREA 2						
Classification (Existing)	D. SCRUB		Classification (Post-Development)	D. SCRUB		
Types Identified	Open scrub D-14	Tussock grassland G-22		Low shrubland C-12		
Effective Slope	Measured	~1.0 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 4m	
Additional Justification:	Mixed species scrub composition Eucalypts. Understory of unmanaged grass in areas of undulating land.					
Post Development Assumptions:	Classified as Scrub as these area are not identified as changing in land use or further reforestation. (Off-site vegetation).					

PHOTO ID: 22

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PHOTO ID: 25

PHOTO ID: 26

PHOTO ID: 27

VEGETATION AREA 2							
Classification (Existing)	D. SCRUB			Classification (Post-Development)		D. SCRUB	
Types Identified	Open scrub D-14		Tussock grassland G-22			Low shrubland C-12	
Effective Slope	Measured		1.0 degrees	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	>30%		Shrub/Heath Height	1-2m	Tree Height	Up to 4m	
Additional Justification:	Mixed species scrub composition Eucalypts. Understory of unmanaged grass in areas of undulating land.						
Post Development Assumptions:	Classified as Scrub as these area are not identified as changing in land use or further reforestation. (On-site and off-site vegetation).						

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STATIC WATER SUPPLIES	
Post Development Assumptions:	In accordance with the Guidelines for Plantation Fire Protection, a minimum of 50,000L strategic water supply and hard stand, no further than 20 minutes turnaround from the area of coverage. The existing development site has water tanks that are suitable as an strategic water supply for fire fighting operations. The tanks will incorporate the required apparatus for fire appliance connection. An asset protection zone of 20m will be constructed around the tank/s devoid of vegetation (all grasses and combustible materials removed) to maintain the integrity throughout a bushfire. The required couplings, access, turn-around and hardstand area will be provided at this water point site. An additional water tank is to be installed near the existing tank site 'B'. Water tanks are to be dedicated for fire-fighting purposes, including the required couplings, access, turn-around and hardstand area. All above ground exposed pipes and fittings to be modified to non-combustible material. The tank strategic water point site and the secondary water supply dams will be sign posted as identified water sources for fire fighting operations. The technical requirements established by the Guidelines and/or the local government can and will be complied with. These requirements are set out in Appendix G.

PHOTO ID: A

PHOTO ID: B

2 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA (GUIDELINES V1.4)

2.1 Bushfire Protection Criteria Elements Applicable to the Proposed Development/Use

APPLICATION OF THE CRITERIA, ACCEPTABLE SOLUTIONS AND PERFORMANCE ASSESSMENT

The criteria are divided into five elements – location, siting and design, vehicular access, water and vulnerable tourism land uses. Each element has an intent outlining the desired outcome for the element and reflects identified planning and policy requirements in respect of each issue.

The example acceptable solutions (bushfire protection measures) provide one way of meeting the element's intent. Compliance with these automatically achieves the element's intent and provides a straightforward pathway for assessment and approval.

Where the acceptable solutions cannot be met, the ability to develop design responses (as alternative solutions that meet bushfire performance requirements) is an alternative pathway that is provided by addressing the applicable performance principles (as general statements of how best to achieve the intent of the element).

A merit based assessment is established by the SPP 3.7 and the Guidelines as an additional alternative pathway along with the ability of using discretion in making approval decisions (sections 2.5, 2.6 and 2.7). This is formally applied to certain development (minor and unavoidable – sections 5.4.1 and 5.7). Relevant decisions by the State Administrative Tribunal have also supported this approach more generally.

Elements 1 – 4 should be applied for all strategic planning proposals, subdivision or development applications, except for vulnerable tourism land uses which should refer to Element 5. Element 5 incorporates the bushfire protection criteria in Elements 1 – 4 but caters them specifically to tourism land uses. (Guidelines DPLH 2021v1.4)

The Bushfire Protection Criteria	Applicable to the Proposed Development/Use
Element 1: Location	Yes
Element 2: Siting and Design	Yes
Element 3: Vehicular Access	Yes
Element 4: Water	Yes
Element 5: Vulnerable Tourism Land Uses	No

2.2 Local Government Variations to Apply

Local governments may add to or modify the acceptable solutions to recognise special local or regional circumstances (e.g., topography / vegetation / climate). These are to be endorsed by both the WAPC and DFES before they can be considered in planning assessments. (Guidelines DPLH 2021v1.4).

Do endorsed regional or local variations to the acceptable solutions apply to the assessments against the Bushfire Protection Criteria for the proposed development /use?	No

The local government will advise the proponent of other applicable specifications such as signage and gates where they appl and "The technical construction requirements for each access type/component can and will be complied with.

2.3 Assessment Statements for Element 1: Location

LOCATION					
Element Intent	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.				
Proposed Development/Use – Relevant Planning Stage	(Do) Development application other than for a single dwelling, ancillary dwelling or minor development				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
A1.1 Development location	Applicable:	Yes	Compliant:	Yes	
ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES					
☑ ☐ ☐ The development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.					
Supporting Assessment Details: The proposed development is able to provide an area of land that can be considered suitable for development as BAL-40 or BAL-FZ construction requirements will not be required to be applied. Where new buildings are required to comply with increased building construction standards, the appropriate sized APZ can be implemented within the subject Lot. This meets the requirements established by Acceptable Solution A1.1.					
ASSESSMENTS APPLYING THE GUIDANCE ESTABLISHED BY THE WAPC ELEMENT 1 & 2 POSITION STATEMENT (2019)					
"Consideration should be given to the site context where 'area' is the land both within and adjoining the subject site. The hazards remaining within the site should not be considered in isolation of the hazards adjoining the site, as the potential impact of a bushfire will be dependent on the wider risk context, including how a bushfire could affect the site and the conditions for a bushfire to occur within the site." Strategic Planning Proposals: Consider the threat levels from any vegetation adjoining and within the subject site for which the potential intensity of a bushfire in that vegetation would result in it being classified as an Extreme Bushfire Hazard Level (BHL). Identify any proposed design strategies to reduce these threats. Structure Plans (lot layout known) and Subdivision Applications: As for strategic planning proposals but within the subject site the relevant threat levels to consider are the radiant heat levels represented by BAL-FZ and BAL-40 ratings.					

The planning proposal is a development application, consequently the referenced position statement is not applicable to the Element 1 assessment.

2.4 Assessment Statements for Element 2: Siting and Design

SITING AND DESIGN OF DEVELOPMENT					
Element Intent	To ensure that the siting and design of development minimises the level of bushfire impact.				
Proposed Development/Use – Relevant Planning Stage	(Do) Development application other than for a single dwelling, ancillary dwelling or minor development				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
A2.1 Asset Protection Zone (APZ)	Applicable:	Yes	Compliant:	Yes	

APZ DIMENSIONS – DIFFERENCES IN REQUIREMENTS FOR PLANNING ASSESSMENTS COMPARED TO IMPLEMENTATION

A key required bushfire protection measure is to reduce the exposure of buildings/infrastructure (as exposed vulnerable elements at risk), to the direct bushfire threats of flame contact, radiant heat and embers and the indirect threat of consequential fires that result from the subsequent ignition of other combustible materials that may be constructed, stored or accumulate in the area surrounding these structures. This reduces the associated risks of damage or loss.

This is achieved by separating buildings (and consequential fire fuels as necessary) from areas of classified bushfire prone vegetation. This area of separation surrounding buildings is identified as the Asset Protection Zone (APZ) and consists of no vegetation and/or low threat vegetation or vegetation continually managed to a minimal fuel condition. The required separation distances will vary according to the site specific conditions and local government requirements.

The APZ dimensions stated and/or illustrated in this Report can vary dependent on the purpose for which they are being identified.

Note: Appendix B 'Onsite Vegetation Management' provides further information regarding the different APZ dimensions that can be referenced, their purpose and the specifications of the APZ that are to be established and maintained on the subject lot.

THE 'PLANNING BAL-29' APZ DIMENSIONS

Purpose: To provide evidence of the development or use proposal's ability to achieve minimum vegetation separation distances. To achieve 'acceptable solution' planning approval for this factor, it must be demonstrated that the minimum separation distances corresponding to a maximum level of radiant transfer to a building of 29 kW/m², either exist or can be implemented (with certain exceptions). These separation distances are the 'Planning BAL-29' APZ dimensions.

The 'Planning BAL-29' APZ is not necessarily the size of the APZ that must be physically implemented and maintained *by a landowner. Rather, its sole purpose is to identify if an acceptable solution for planning approval can be met.*

THE 'REQUIRED' APZ DIMENSIONS

Purpose: Establishes the dimensions of the APZ to be physically implemented by the landowner on their lot: These will be the minimum required separation distances from the subject building(s) to surrounding bushfire prone vegetation (identified by type and associated ground slope). These are established by:

A. The 'BAL Rating APZ' of the subject building(s) when distances are greater than 'B' below (except when 'B' establishes a maximum distance); or

B. The 'Local Government' APZ' derived from the Firebreak/Hazard Reduction Notice when distances are greater than 'A' above, other than when a maximum distance is established, in which case this will apply; or

C. A combination of 'A' and 'B'.

*Within this Report/Plan it is the **'Planning BAL-29' APZ** that will be identified on maps, diagrams and in tables as necessary – unless otherwise stated.*

*The **'Required'** APZ dimension information will be presented in Appendix B1.1 and on the Property Bushfire Management Statement, when required to be included for a development application.*

ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES

☑ ☐ ☐	APZ Width: The proposed (or a future) habitable building(s) on the lot(s) of the proposed development - or an existing building for a proposed change of use – can be (or is) located within the developable portion of the lot and be surrounded by a 'Planning BAL-29' APZ of the required dimensions (measured from any external wall or supporting post or column to the edge of the classified vegetation), that will ensure their exposure to the potential radiant heat impact of a bushfire does not exceed 29 kW/m^2.
☐ ☐ ⊘	Restriction on Building Location: It has been identified that the current developable portion of a lot(s) provides for the proposed future (or a future) building/structure location that will result in that building/structure being subject to a BA-40 or BAL-FZ rating. Consequently, it may be considered necessary to impose the condition that a restrictive covenant to the benefit of the local government pursuant to section 129BA of the Transfer of Land Act 1893, is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of that portion of land (refer to Code F3 of Model Subdivision Conditions Schedule, WAPC June 2021 and Guidelines s5.3.2).
☑ ☐ ☐	APZ Location: The required dimensions for a 'Planning BAL-29' APZ can be contained solely within the boundaries of the lot(s) on which the proposed (or a future) habitable building(s) - or an existing building(s) for a proposed change of use – is situated.
☐ ☐ ⊘	APZ Location: The required dimensions for a 'Planning BAL-29' APZ can be partly established within the boundaries of the lot(s) on which the proposed (or a future) habitable building(s) - or an existing building(s) for a proposed change of use – is situated. The balance of the APZ would exist on adjoining land that satisfies the exclusion requirements of AS 3959:2018 cl 2.2.3.2 for non-vegetated areas and/or low threat vegetation and/or vegetation managed in a minimal fuel condition.
☐ ☐ ⊘	APZ Location: It can be justified that any adjoining (offsite) land forming part of a 'Planning BAL-29' APZ will: • If non-vegetated, remain in this condition in perpetuity; and/or • If vegetated, be low threat vegetation or vegetation managed in a minimal fuel condition in perpetuity.
☑ ☐ ☐	APZ Management: The area of land (within each lot boundary), that is to make up the required 'Landowner' APZ dimensions (refer to Appendix B, Part B1), can and will be managed in accordance with

	the requirements of the Guidelines Schedule 1 'Standards for Asset Protection Zones' (refer to Appendix B).
☐ ☐ ⊘	Subdivision Staging: There are undeveloped future stages of subdivision, containing bushfire prone vegetation, that have been taken into consideration for their potentially 'temporary' impact on the ability to establish a 'Planning BAL-29' APZ on adjoining developed lots. A staging plan is developed to manage this.
☑ ☐ ☐	Firebreak/Hazard Reduction Notice: Any additional requirements established by the relevant local government's annual notice to install firebreaks and manage fuel loads (issued under s33 of the Bushfires Act 1954), can and will be complied with.
Supporting Assessment Details: No buildings proposed for this site. Existing infrastructure and buildings to comply with Guidelines for Plantation Fire Protection and the Local Government Firebreak Notice.	
ASSESSMENTS APPLYING THE GUIDANCE ESTABLISHED BY THE WAPC ELEMENT 1 & 2 POSITION STATEMENT (2019)	
Strategic Planning Proposals: "At this planning level there may not be enough detail to demonstrate compliance with this element. The decision-maker may consider this element is satisfied where A1.1 is met." **Structure Plans (lot layout known) and Subdivision Applications:** "Provided that Element 1 is satisfied, the decision-maker may consider approving lot(s) containing BAL-40 or BAL-FZ under the following scenarios.	

The planning proposal is a development application, consequently the referenced position statement is not applicable to the proposed development.

2.5 Assessment Statements for Element 3: Vehicular Access

VEHICULAR ACCESS	
Element Intent	To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.
Proposed Development/Use – Relevant Planning Stage	(Do) Development application other than for a single dwelling, ancillary dwelling or minor development
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.
Pathway Applied to Provide an Alternative Solution	N/A

Acceptable Solutions - Assessment Statements

All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.

The technical construction requirements for access types and components, and for each firefighting water supply component, are also presented in Appendices 2 and 3. The local government will advise the proponent where different requirements are to apply and when any additional specifications such as those for signage and gates are to apply (these are included in the relevant appendix if requested by the local government).

Solution Component Check Box Legend ☑ Relevant & met ☒ Relevant & not met ⊘ Not relevant

A3.1 Public roads — Applicable: Yes — Compliant: Yes

☑ ☐ ☐ The technical construction requirements of vertical clearance and weight capacity (Guidelines, Table 6) can and will be complied with (Refer also to Appendix C in this BMP).

☑ ☐ ☐ All other applicable technical requirements of trafficable width, gradients and curves, are required to be in "accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Ausroad Standards and/or any applicable standard in the local government area" (Guidelines, Table 6 and E3.1. Refer also to Appendix C in this BMP).

The assessment conducted for the bushfire management plan indicates that it is likely that the proposed development can and will comply with the requirements.

However, the applicable class of road, the associated technical requirements and subsequent proposal compliance, will need to be confirmed with the relevant local government and/or Main Roads WA.

☑ ☐ ☐ A traversable verge is available adjacent to classified vegetation (Guidelines, E3.1), as recommended.

Supporting Assessment Details: No new roads being constructed as part of the development proposal. Existing local roads provide emergency services and public access relevant to the local conditions and local government planning requirements.

A3.2a Multiple access routes — Applicable: Yes — Compliant: Yes

☑ ☐ ☐ For each lot, two-way public road access is provided in two different directions to at least two different suitable destinations with an all-weather surface.

☐ ☐ ⊘	The two-way access is available at an intersection no greater than 200m from the relevant boundary of each lot, via a no-through road.
☐ ☐ ⊘	The two-way access is not available at an intersection within 200m from the relevant boundary of each lot. However, the available no-through road satisfies the established exemption for the length limitation in every case. These requirements are: • Demonstration of no alternative access (refer to A3.3 below); • The no-through road travels towards a suitable destination; and • The balance of the no-through road that is greater than 200m from the relevant lot boundary is within a residential built-out area or is potentially subject to radiant heat levels from adjacent bushfire prone vegetation that correspond to the BAL-LOW rating (<12.5 kW/m²).
Supporting Assessment Details: Bunketch East Road enables travel in two different directions via the local road network. These local roads, where unsealed, provide a trafficable surface with two-way traffic capability.	
A3.2b Emergency access way	Applicable: No Compliant: -
☐ ☐ ⊘	The proposed or existing EAW provides a through connection to a public road.
☐ ☐ ⊘	The proposed or existing EAW is less than 500m in length and will be signposted and gated (remaining unlocked) to the specifications stated in the Guidelines and/or required by the relevant local government.
☐ ☐ ⊘	The technical construction requirements for widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.2b. Refer also to Appendix C in this BMP), can and will be complied with.
Supporting Assessment Details: 'None Required'	
A3.3 Through-roads	Applicable: No Compliant: -
☐ ☐ ⊘	A no-through public road is necessary as no alternative road layout exists due to site constraints.
☐ ☐ ⊘	The no-through public road length does not exceed the established maximum of 200m to an intersection providing two-way access (Guidelines, E3.3).
☐ ☐ ⊘	The no-through public road exceeds 200m but satisfies the exemption provisions of A3.2a as demonstrated in A3.2a above.
☐ ☐ ⊘	The public road technical construction requirements (Guidelines, Table 6 and E3.1. Refer also to Appendix C in this BMP), can and will be complied with as established in A3.1 above.
☐ ☐ ⊘	The turnaround area requirements (Guidelines, Figure 24) can and will be complied with.
Supporting Assessment Details: 'None Required'	
A3.4a Perimeter roads	Applicable: No Compliant: -
☐ ☐ ⊘	The proposed greenfield or infill development consists of 10 or more lots (including those that are part of a staged subdivision) and therefore should have a perimeter road. This is planned to be installed.

☐ ☐ ⊘	The proposed greenfield or infill development consists of 10 or more lots (including those that are part of a staged subdivision). However, it is not required on the established basis of: • The vegetation adjoining the proposed lots is classified Class G Grassland; • Lots are zoned rural living or equivalent; • It is demonstrated that it cannot be provided due to site constraints; or • All lots have existing frontage to a public road.
☐ ☐ ⊘	The technical construction requirements of widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.4a) can and will be complied with.
Supporting Assessment Details: 'None Required'	

A3.4b Fire service access route	Applicable:	No	Compliant:	-

☐ ☐ ⊘	The FSAR can be installed as a through-route with no dead ends, linked to the internal road system every 500m and is no further than 500m from a public road.
☐ ☐ ⊘	The technical construction requirements of widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.4b. Refer also to Appendix C in this BMP), can and will be complied with.
☐ ☐ ⊘	The FSAR can and will be signposted. Where gates are required by the relevant local government, the specifications can be complied with.
☐ ☐ ⊘	Turnaround areas (to accommodate type 3.4 fire appliances) can and will be installed every 500m on the FSAR.
Supporting Assessment Details: 'None Required'	

A3.5 Battle-axe access legs	Applicable:	No	Compliant:	-

☐ ☐ ⊘	A battle-axe leg cannot be avoided due to site constraints.
☐ ☐ ⊘	The proposed development is in a reticulated area and the battle-axe access leg length from a public road is no greater than 50m. No technical requirements need to be met.
☐ ☐ ⊘	The proposed development is not in a reticulated area. The technical construction requirements for widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.5. Refer also to Appendix C in this BMP), can and will be complied with.
☐ ☐ ⊘	Passing bays can and will be installed every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m.
Supporting Assessment Details: 'None Required'	

A3.6 Private driveways	Applicable:	Yes	Compliant:	Yes

☐ ☐ ⊘	The private driveway to the most distant external part of the development site is within a lot serviced by reticulated water, is accessed via a public road with a speed limit of 70 km/hr or less and has a length is no greater than 70m (measured as a hose lay). No technical requirements need to be met.

☑ ☐ ☐	The technical construction requirements for widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.6. Refer also to Appendix C in this BMP), can and will be complied with.
☑ ☐ ☐	Passing bays can and will be installed every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m.
☑ ☐ ☐	The turnaround area requirements (Guidelines, Figure 28, and within 30m of the habitable building) can and will be complied with.
Supporting Assessment Details: Driveways to be constructed to meet the technical construction requirements for widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.6. Refer also to Appendix F in this BMP), can and will be complied with. The site has access to three different points of entry/exit via Bunketch East Road to the north and via Pollard Road to the east.	

2.6 Assessment Statements for Element 4: Water

FIREFIGHTING WATER					
Element Intent	To ensure water is available to enable people, property and infrastructure to be defended from bushfire.				
Proposed Development/Use – Relevant Planning Stage	(Do) Development application other than for a single dwelling, ancillary dwelling or minor development				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.* *The technical construction requirements for access types and components, and for each firefighting water supply component, are also presented in Appendices 2 and 3. The local government will advise the proponent where different requirements are to apply and when any additional specifications such as those for signage and gates are to apply (these are included in the relevant appendix if requested by the local government).*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
A4.1 Identification of future firefighting water supply	Applicable:	No	Compliant:	-	
☐ ☐ ⃠	It can be demonstrated that reticulated or sufficient non-reticulated water for firefighting can be provided at the subdivision and/or development application stage in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2.				
Supporting Assessment Details: 'None Required'					
A4.2 Provision of water for firefighting purposes	Applicable:	Yes	Compliant:	Yes	
☐ ☐ ⃠	A reticulated water supply is available to the proposed development. The existing hydrant connection(s) are provided in accordance with the specifications of the relevant water supply authority.				
☐ ☐ ⃠	A reticulated water supply will be available to the proposed development. Hydrant connection(s) can and will be provided in accordance with the specifications of the relevant water supply authority.				
☑ ☐ ☐	A static water supply (tank/s) for firefighting purposes will be installed on the lot that is additional to any water supply that is required for drinking and other domestic purposes.				
☐ ☐ ⃠	A strategic water supply (tank or tanks) for firefighting purposes will be installed within or adjacent to the proposed development that is additional to any water supply that is required for drinking and other domestic purposes. The required land will be ceded free of cost to the local government and the lot or road reserve where the tank is to be located will be identified on the plan of subdivision.				

☐ ☐ ⊘	The strategic static water supply (tank or tanks) will be located no more than 10 minutes travel time from a subject site (at legal road speeds).
☑ ☐ ☐	The technical requirements (location, number of tanks, volumes, design, construction materials, pipes and fittings), as established by the Guidelines (A4.2, E4 and Schedule 2) and/or the relevant local government, can and will be complied with.

Supporting Assessment Details: Water supplies in accordance with the Department of Fire and Emergency Services (DFES) Guidelines for Plantation Fire Protection (as agreed upon by the Forest Industries Federation of Western Australia (FIFWA)), will be provided. This is in addition to any water supply that is required for drinking and other domestic purposes.

A minimum of 50,000L strategic water supply and hard stand, no further than 20 minutes turnaround from the area of coverage, is to be available for fire fighting operations.

Additional water tank/s are to be installed, where the required 50,000ltr is not met, dedicated for fire-fighting purposes including the required couplings, access, turn-around and hardstand area.

The tank strategic water point sites will be sign posted as identified water sources for fire fighting operations.

All above ground exposed pipes and fittings to be modified to non-combustible material.

An asset protection zone will be constructed around the tank/s devoid of vegetation (all grasses and combustible materials removed) to maintain the integrity throughout a bushfire. The required couplings, access, turn-around and hardstand area will be provided at this water point site.

Note: Reticulated water is available to this site.

Refer to information contained in Appendix D for the firefighting water supply specifications and technical requirements.

3 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE PROTECTION MEASURES

3.1 Developer/Landowner Responsibilities – Prior to Operation

DEVELOPER/LANDOWNER RESPONSIBILITIES – PRIOR TO OPERATION	
No.	Implementation Actions
1	The local government may condition a development application approval with a requirement for the landowner/proponent to register a notification onto the certificate of title and deposited plan. This will be done pursuant to Section 70A *Transfer of Land Act 1893* as amended ('Factors affecting use and enjoyment of land, notification on title'). This is to give notice of the bushfire hazard and any restrictions and/or protective measures required to be maintained at the owner's cost. This condition ensures that: 1. Landowners/proponents are aware their lot is in a designated bushfire prone area and of their obligations to apply the stated bushfire risk management measures; and 2. Potential purchasers are alerted to the Bushfire Management Plan so that future landowners/proponents can continue to apply the bushfire risk management measures that have been established in the Plan.
2	Establish the Asset Protection Zone (APZ) around habitable buildings (and other structures as required) to satisfy: • The dimension requirements established by the assessed site specific conditions and the building's determined BAL rating, or the dimensions established by the annually issued local government Firebreak Notice – whichever is greater; and • The standards established by the Guidelines DPLH, 2021 v1.4, Schedule 1, or as varied by the local government through their annually issued Firebreak Notice. This is the responsibility of the developer/landowner before occupancy.
3	The subject lot is to be compliant with current version of the Shire of Dalwallinu Bush Fire Information (Firebreak Notice) issued under s33 of the Bushfires Act 1954. This may include specifications for asset protection zones that differ from Schedule 1 in the Guidelines DPLH, 2021 v1.4, with the intent to better satisfy local conditions.
4	Construct the internal private driveways to comply with the technical requirements referenced in the BMP.
5	Install/Maintain the required firefighting static water supply to comply with the technical requirements stated in the BMP.
6	Implement the bushfire protection measures that have been established within this BMP as measures additional to those established by the acceptable solutions.
7	Indicate on plantation map and erect signage to show compartment (Cell) name/number, to be prominently displayed within the site that informs those persons onsite the Cell location in the event of a bushfire. This will include evacuation route information.

8	Prior to occupancy, all actions contained within the 'Pre-Season Preparation Procedure' established by the Bushfire Management Plan, must be completed.
9	A BAL assessment report may be required for new building works to confirm determined ratings and will be required when ratings are indicative. BAL certificates will need to be issued to accompany building applications. The BMP may also establish, as an additional bushfire protection measure, that construction requirements to be applied will be those corresponding to a specified higher BAL rating. Compliance with the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks). Other classes of buildings may also be required to comply with this construction when established by the relevant authority or if identified as an additional bushfire protection measure within the BMP. The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended).

3.2 Landowner/Occupier Responsibilities – Ongoing Management

LANDOWNER/OCCUPIER – ONGOING MANAGEMENT	
No.	Management Actions
1	Maintain the Asset Protection Zone (APZ) around habitable buildings (and other structures as required) to satisfy: • The dimension requirements established by the assessed site specific conditions and the building's determined BAL rating, or the dimensions established by the annually issued local government Firebreak Notice – whichever is greater; and • The standards established by the Guidelines DPLH, 2021 v1.4, Schedule 1, or as varied by the local government through their annually issued Firebreak Notice.
2	Comply with the Local Government/s Fire Break and Fuel Hazard Reduction Notice issued under s33 of the Bush Fires Act 1954. Check the notice annually for any changes.
3	Maintain vehicular access routes within the lot to comply with the technical requirements referenced in the BMP and the relevant local government annual firebreak notice.
4	Maintain the signposted 'Cell' indicators.
5	Maintain the static firefighting water supply tanks and associated pipes/fittings/pump and vehicle hardstand in good working condition.
6	Ensure that builders engaged to construct dwellings/additions and/or other relevant structures on the lot, are aware of the existence of this approved Bushfire Management Plan (BMP). The plan identifies that the development site is within a designated bushfire prone area and states the indicative (or determined) BAL rating(s) that may (or will) be applied to buildings/structures. A BAL assessment report may be required to confirm determined ratings and will be required when ratings are indicative. BAL certificates will need to be issued to accompany building applications. The BMP may also establish, as an additional bushfire protection measure, that construction requirements to be applied will be those corresponding to a specified higher BAL rating. Compliance with the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks). Other classes of buildings may also be required to comply with this construction when established by the relevant authority or if identified as an additional bushfire protection measure within the BMP. The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended).
7	Ensure all future buildings the landowner has responsibility for, are designed and constructed in full compliance with: • The bushfire resistant construction requirements of the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), as established by the Building Regulations 2012 (WA Building Act 2011); and Any additional bushfire protection measures this Bushfire Management Plan has established are to be implemented.

8	Maintain the bushfire protection measures that have been established within this BMP as measures additional to those established by the acceptable solutions.
9	Annually review the Bushfire Management Plan and complete all actions at the appropriate times of the year.
10	The bushfire specific content of the operation's site emergency plan must be reviewed annually, relevant information updated and ensure all bushfire related preparation procedures are carried out.
11	Annual review of the BMP to implement the bushfire protection measures that have been established within this BMP as strategies additional to those established by the acceptable solutions: 1. Seasonal Prescribed Burning Planning; 2. Seasonal Hazardous Fuel Management; Seasonal Pre Incident Preparedness.

3.3 Local Government - Ongoing Management

LOCAL GOVERNMENT – ONGOING MANAGEMENT	
No.	Management Actions
1	Monitor landowner compliance with the annual Local Government Fire Break & Fuel Hazard Reduction Notice and with any bushfire protection measures that are: • Established by this BMP; • Are required to be maintained by the landowner/occupier; and • Are relevant to local government operations.

APPENDIX A: PLANTATION SPECIES

Mixed species composition (Various Mallee Species) for long duration non-harvesting carbon stores requires the long term management of fuel loads in these plantings and may be limited due to contract restrictions which needs to be factored. Most plantations have a high grassy fuel understory for the first few years after planting which will require management strategies to be implemented. It is assumed that plantation areas may be managed to some degree (through fuel load reduction) in a reduced fuel condition in the understory with a predominance of emergent grasses, which will support fragmented wind-driven grassland fire behaviour in the early phases of plant establishment. The vegetation classifications given below assume insufficient management for classification as Low Threat vegetation, and thus classification follows AS3959-2018. Species with mature heights of maximally ~6m or less, or where heights of >6m are rare, are considered shrubs, and classified to either Class C Shrubland or Class D Scrub depending on predicted mature heights. Species with mature heights are commonly >6m are considered as trees, Class A Forest (AS3959-2018).

Planting Management Guide – Canopy >2m tall and cover up to 20% at maturity over the planting area

Lifecycle situation	Fuel Description	Bushfire Hazard
e.g. Young plantation up to 2 years after planting	Grassy fuels dominate. Fuel load: <5 tonnes per hectare. Vulnerable to grass fires. Grass and weed control required.	Low Hazard
e.g. Developing plantation 3 to 6 years after planting	Grassy fuel cover. Fuel rates depend on site location and will be a mixture of grass and some leaf litter and fine limbs. Fuel load: <5 tonnes per hectare.	Low Hazard
e.g. Plantation 6 to 10 years after planting	Continuous fuel cover, primarily of grass and leaf litter. Leaf litter will be around 2 to 3 tonnes per hectare. Grass fuels will be around 5 tonnes per hectare unless harvested/slashed.	Low Hazard
	Planting format will result in canopy closure within plantation.	
	Continuous fuel cover, primarily of grass and leaf litter. Leaf litter will be greater than 3 tonnes per hectare. Grass fuels will be around 5 tonnes per hectare unless harvested/slashed. When combined available grass fuels and leaf litter exceed 10 tonnes per hectare, hazard reduction work must be undertaken. It is acceptable for between 20 to 40 percent of the area to be > 8t/ha in any year, but the fuel load must be < 5t/ha in the 300 metres adjacent to any external compartment boundary.	
	Planting format will permit canopy closure across the site. When this occurs the fuel accumulation rate will increase.	
e.g. Plantation greater than 10 years after planting		Moderate Hazard unless fuel loads are reduced

Additional Information: Develop a planned burning program. Plan for low intensity burns, during autumn or late spring, that create a mosaic of fuels and will not scorch canopy or kill trees so they can regenerate. • Implement good hygiene measures to minimise risk of dieback spread during activities. • Plan for post-fire weed control to assist regeneration after fire. • If you are undertaking a planned burn for bushfire mitigation purposes then you are able to undertake burning at intervals which will be influenced by fuel loads. However, where possible and without compromising any bushfire mitigation requirements, it is better to extend the period between burns to assist in maintaining vegetation health. The planned fire regime should be developed to consider the frequency, season, intensity and pattern characteristics of fire. These can be influenced by decisions including how, when and under which conditions fires are lit. Fire exclusion can also be classed as a fire regime as plant and animal compositions will continue to change in the absence of fire.

A1.2: Summary Site Data Applied to Construction of the BAL Contour Map(s)

Table A1.2: Summary of applied calculation input variables applied to determining the site specific separation distances corresponding to each bushfire attack level.

SUMMARY OF CALCULATION INPUT VARIABLES (INCLUDING SITE DATA) APPLIED TO THE DETERMINATION OF SEPARATION DISTANCES CORRESPONDING TO BUSHFIRE ATTACK LEVELS [1]													
Applied BAL Determination Method		METHOD 1 - SIMPLIFIED PROCEDURE (AS 3959:2018 CLAUSE 2.2)											
Calculation Variables Corresponding to BAL Determination Method													
Methods 1 and 2		Method 1	Method 2										
Vegetation Classification		FDI	Effective Slope		Site Slope	FFDI or GFDI	Flame Temp.	Elevation of Receiver	Flame Width	Fireline Intensity	Flame Length	Modified View Factor	
			Applied Range	Measured									
Area	Class		degree range	degrees	degrees		K	metres	metres	kW/m	metres	% Reduction	
1	(G) Grassland	80	Upslope or flat 0	0									
1	(G) Grassland		Downslope >0-5	1.3									
2	(D) Scrub		Upslope or flat 0	0									
2	(D) Scrub		Downslope >0-5	1.0									

[1] All data and information supporting the determination of the classifications and values stated in this table and any associated justification, is presented in Appendix A.

Where the values are stated as 'default' these are either the values stated in AS 3959:2018, Table B1 or the values calculated as intermediate or final outputs through application of the equations of the AS 3959:2018 BAL determination methodology. They are not values derived by the assessor.

Measured slope across the site average 1.0 degree – undulating land <5 degrees slope

Table A1.3: Vegetation separation distances corresponding to radiant heat levels and illustrated as BAL contours in Figure 3.2.

THE CALCULATED VEGETATION SEPARATION DISTANCES CORRESPONDING TO THE STATED LEVEL OF RADIANT HEAT [1]									
Vegetation Classification		Separation Distances Corresponding to Stated Level of Radiant Heat (metres)							
		Bushfire Attack Level						Maximum Radiant Heat Flux	
Area	Class	BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW	10 kW/m^2	2 kW/m^2
1	(G) Grassland (Flat or Upslope)	<6	6-<8	8-<12	12-<17	17-<50	>50	-	-
1	(G) Grassland	<7	7-<9	9-<14	14-<20	20-<50	>50		
2	(D) Scrub (Flat or Upslope)	<10	10-<13	13-<19	19-<17	17-<100	>100	-	-
2	(D) Scrub	<11	11-<15	15-<22	22-<31	31-<100	>100		
[1] All calculation input variables are presented in Table A1.2									

1. The Shire of Dalwallinu standard requirement for an asset protection zone (APZ) dimension around a building or an asset of value is 20m.

2. Guidelines for Plantation Fire Protection require an asset protection zone (APZ) between the plantation and an existing or approved habitable building must be a minimum of 100 metres, unless the building has been constructed to an approved higher standard.

3. Guidelines for Plantation Fire Protection require an asset protection zone (APZ) between the plantation and an existing or approved non- habitable structure (i.e. sheds and enclosed storage areas) must be a minimum of 50 metres.

The above Guidelines for Plantation Fire Protection requirements for an APZ comprise the following (Refer Figures 3.2):

PLANTATION AREA — Hazard Separation Zone/Low Fuel Zone <8t/ha + Firebreak 6m + APZ 20m < 2t/ha — HABITABLE BUILDING

Total 100m

APPENDIX B: PLANTATION BUSHFIRE PROTECTION SPECIFICATIONS

Install and maintain external perimeter and internal firebreaks that form compartment cells, and engage in hazard reduction measures that reduce fuel loads so as to protect neighbouring communities and essential infrastructure, including any additional requirements determined by the Local Government.

Compartment Size (Cell)	Up to 100 hectares each 'Cell' based on local conditions (sandy soils, moderate rainfall, existing remnant vegetation (scrub/grassland), plantation species (scrub) and density of the proposed planting (500 stems per hectare).		
Firebreaks & Access	A minimum 15 metre bare earth immediately inside all external boundaries of the plantation areas. A minimum width of 10 metres of bare earth for all internal firebreaks for compartments (Cells) not larger than 100 hectares. Maintained in a trafficable condition for emergency vehicles (fire appliances) with a vertical axis clearance of 4 metres for all firebreaks. Firebreaks must be maintained in line with the annual firebreak notice developed by the Local Government. Firebreaks and Access to meet the technical requirements as detailed in Appendix F		
Water Supplies	Maintain a strategic water supply of minimum 50,000ltrs (tank/s) dedicated to fire fighting on site). Water sources are required to be positioned to provide a maximum 20 minute refill turnaround from anywhere within the plantation. The water source point must have a hardstand area for heavy trucks to park on whilst drawing water. Suitable metal fittings must be available on the water tank for fire appliance connection.		
Dwellings and assets of value	Habitable Buildings:100 metre hazard separation zone incorporating 6 metre firebreak. Non-Habitable Buildings/Sheds: 50 metre hazard separation zone incorporating 6 metre firebreak.		
Western Power – Both sides from centreline	Power – Single pole support up to 33kV	Horizontal Clearance 7 metres	Vertical Clearance 3 metres around lines
	Power – Double pole support up to 66 - 132kV	Horizontal Clearance 7 metres	Vertical Clearance 4 metres around lines
	Power – Steel pylon support up to 330kV	Contact service provider	Vertical Clearance Contact service provider
Telstra (No heavy machinery to turn around on lines)	Telephone (Copper)	5 metres both sides or 6 metres total if accurately line marked	
	Telephone (Fibre optic)	10 metres both sides	
Water/sewer pipelines (Water Corporation)	6 metres		
Gas pipeline	30 metres easement plus additional setbacks as required by the WAPC Planning Bulletin 87 and the Department of Planning Land Use Guidelines in pipeline corridors or subsequent versions of these documents.		

*All clearance/separation distances may be subject to changes and must be confirmed with the relevant agency.

APPENDIX C: RESPONSIBLE PERSONS ONSITE

RESPONSIBILITIES

A property layout map is to be provided to the local government and local brigades containing fire equipment locations and contacts. These are updated annually and submitted at the commencement of bushfire season. Copies of this information are placed in fire information tubes at key entrances the property (plantation site).

CONTACTS: RESPONSIBLE PERSONS ONSITE

This contact list must be updated regularly with any changes of responsibility.

Details:	Role:	Plantation Bushfire Manger (Chief)
	Name:	
	Mobile Number:	
	Landline Number:	
Details:	Role:	Plantation Coordinator (Deputy)
	Name:	
	Mobile Number:	
	Landline Number:	
Details:	Role:	Plantation Fire Officer
	Name:	
	Mobile Number:	
	Landline Number:	
Details:	Role:	Plantation Fire Officer
	Name:	
	Mobile Number:	
	Landline Number:	

APPENDIX D: EMERGENCY CONTACTS & INFORMATION TO MONITOR

EMERGENCY CONTACTS

EMERGENCY SERVICES

AGENCY/AUTHORITY	SERVICES	CONTACT
Department of Fire and Emergency Services / Police / Ambulance	Will respond to life threatening emergencies. Use to report a fire.	**Phone call: triple zero '000'** Phone app: EMERGENCY PLUS
State Emergency Service (SES)	Emergency assistance - securing your property, rescuing persons.	13 2500

FACILITY/PREMISES PERSONNEL WITH EMERGENCY RESPONSIBILITIES

EMERGENCY ROLE	POSITION HELD AT FACILITY/PREMISES	LOCATION	CONTACT
A property layout map is to be provided to the local government and local brigades containing fire equipment locations and contacts. These are updated annually and submitted at the commencement of bushfire season. Copies of this information are placed in fire information tubes at key entrances the property (plantation site).			

UTILITIES / MEDICAL / ASSISTANCE

AGENCY/ORGANISATION	SERVICES	CONTACT
Dalwallinu District Hospital	Medical services	(08) 9661 0200
Dalwallinu Medical Centre	Medical services	(08) 9661 1203
Western Power	Response to electricity supply outages and damage.	13 1351
Crisis Care	Crisis accommodation	1800 199 008
Australian Red Cross	Humanitarian assistance	1800 733 276 Website: redcross.org.au/emergencies
Salvation Army	Social services care	13 72 58 (13 SALVOS) Website: salvationarmy.org.au/need-help/disasters-and-emergencies/

INFORMATION TO MONITOR AND INFORM DECISION MAKING

IMPORTANT - AWARENESS OF YOUR SURROUNDINGS

Know the types of vegetation that grow on surrounding land. Be aware of the potential behaviour of a fire in this vegetation and the threats it can present under different conditions.

Relevant information is included in Appendix 5.

Knowledge and current environment awareness is a valuable source of information that will assist with decision making. Stay alert to current and immediate past weather conditions (hot/dry presenting the worst conditions). Lookout for any evidence of fire (smoke) within your surrounding landscape, for as far as you can see. Be aware of the current and forecast wind direction as any fire will be likely to spread in the direction to which the wind is blowing.

SOURCE	INFORMATION	CONTACT
Emergency WA	Alerts & Warnings. Incidents, fire danger ratings, total fire bans, prescribed burns, preparation, and recovery information.	Website: emergency.wa.gov.au
Department of Fire & Emergency Services	General public emergency information.	Information Line: 13 3337 (13 DFES) dfes_wa dfeswa Website (during a bushfire): dfes.wa.gov.au/hazard-information/bushfire/during Website (recovering from a bushfire): dfes.wa.gov.au/hazard-information/bushfire/recovery
Local Radio	Bushfire alerts, warnings, and information.	Local Radio Stations: ABC (AM/digital) or 6PR (882) Website: abc.net.au/radio/stations
Emergency Alert on Phone	Voice messages (landline) and text messages (mobile) can be sent within a defined area under an immediate threat.	An automated government telephone warning system.
Bushfire.IO	Map based bushfire warnings, bushfire incidents and wind forecasts. Good visual tool run privately – crosscheck with other sources.	Website: bushfire.io

Bureau of Meteorology	Current / forecast fire weather and fire danger ratings.	Website: bom.gov.au/wa/index.shtml
Parks and Wildlife Service	Bushfire alerts and warnings, prescribed burns in national parks.	Website: dpaw.wa.gov.au
Main Roads WA	Incidents, issues and roadworks.	13 8138 Website: travelmap.mainroads.wa.gov.au/Home/Map

Understanding Certain Fire Behaviours: The information below will assist decision making by making persons aware of potential limitations to the time available to conduct the designated Primary Procedure. This is important information to be aware of - particularly in the absence of any Emergency Warnings. If evacuating, it must be conducted early to be safe. Leaving late is a high risk action as the likelihood of the facility/premises or the evacuation route being impacted by fire increases significantly. Being on roads when a bushfire is close is a high risk action.

DAILY FORECAST FIRE DANGER RATING	BUSHFIRE		GRASSFIRE
	Potential Forward Rate of Spread	Potential Spotting Ahead Distance	Potential Forward Rate of Spread
Catastrophic	>2km/hr can be expected, possibly	20-30 km	>8km/hr can be expected, possibly
Extreme	0.7km/hr to 3km/hr	12 km	5km/hr to 16km/hr
High	0.3km/hr to 1km/hr	4 km	2.5km/hr to 10km/hr
Moderate	60 to 600m/hr	2 km	0.5km/hr to 6km/hr
No rating	20 to 110m/hr	<150 m	<1.3km/hr

Slope: Fire in vegetation will travel quicker up a slope. For every 10 degrees, the forward rate of spread will double. Vegetation Spotting Potential: Bark fuels are the greatest contributor. Fine fibrous bark = massive ember quantity and short distance spotting; ribbon/candle bark = substantial quantities of spotting at distances greater than 2km and shorter distances; smooth/platy/papery/course fibre barks = limited quantities of short distance spotting.

THE ASSET PROTECTION ZONE (APZ)

This is an area surrounding a habitable building containing either no fire fuels and/or low threat fire fuels that are maintained in a minimal fuel condition. The primary objectives include:

- To ensure the building is sufficiently separated from the bushfire hazard to limit the impact of its direct attack mechanisms. That is, the dimensions of the APZ will, for most site scenarios, remove the potential for direct flame contact on the building, reduce the level of radiant heat to which the building is exposed and ensure some reduction in the level of ember attack (with the level of reduction being dependent on the vegetation types of present);
- To ensure any vegetation retained within the APZ presents low threat levels and prevents surface fire spreading to the building;
- To ensure other combustible materials that can result in consequential fire (typically ignited by embers) within both the APZ and parts of the building, are eliminated, minimised and/or appropriately located or protected. The explanatory notes in the Guidelines provide some guidance for achieving this objective and other sources are available. This is a primary cause of building loss in past bushfire events; and
- Provide a defendable space for firefighting activities.

E1: The Dimensions and Location of the APZ to be Established and Maintained

THE APZ DIMENSIONS

The determined BAL rating of the relevant building/structure will establish the corresponding bushfire construction requirements that are to apply. The minimum required APZ dimensions must be those that will ensure the retention of the determined BAL rating. This ensures that the potential radiant heat exposure of the building/structure will be limited to the level that the applied construction requirements are designed to resist.

The size of the APZ that is to be established and maintained surrounding the subject building/structure, will be the largest that is defined by either:

- The dimensions corresponding to the determined BAL rating stated on the BAL Certificate and which accounts for the specific site conditions; or
- The dimensions established by the relevant local government's annual firebreak notice as can be issued under s33 of the Bushfires Act 1954. This may state a required single minimum dimension for an APZ surrounding a building, or a dimension that varies with slope of the land under the different areas of bushfire prone vegetation that impact the building. Check the notice annually for revisions to requirements.

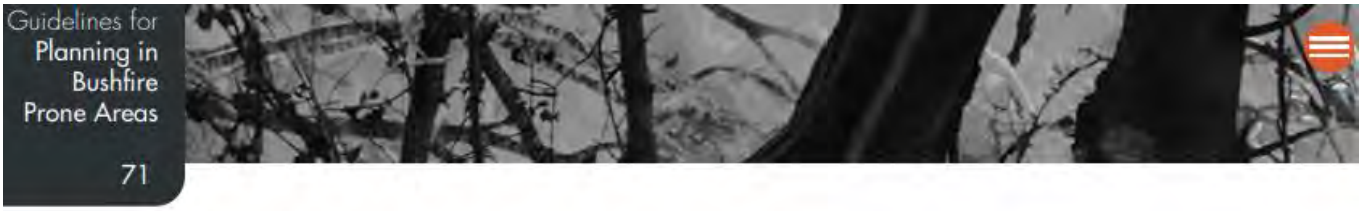
THE APZ LOCATION

The APZ should be contained solely within the boundaries of the lot, except in instances where the neighbouring lot(s) or adjacent public land is non-vegetated or will be maintained to a low-fuel state in perpetuity, and this can be justified. Where possible, planning for siting and design of development should incorporate elements that include non-vegetated areas (e.g., roads / parking / drainage / water body) and/or formally managed areas of vegetation (public open space / recreation areas / services installed in a common section of land), as either part of the required APZ dimensions for each lot or to additionally increase separation distances to reduce exposure further.

E2: The Standards for the APZ as Established by the Guidelines (DPLH, v1.4)

Within the Guidelines (source: https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas), the management Standards are established by:

- Schedule 1: Standards for Asset Protection Zones (see extract below) established by the Guidelines; and
- The associated explanatory notes (Guidelines E2) that address (a) managing an asset protection zone (APZ) to a low threat state (b) landscaping and design of an asset protection zone and (c) plant flammability.

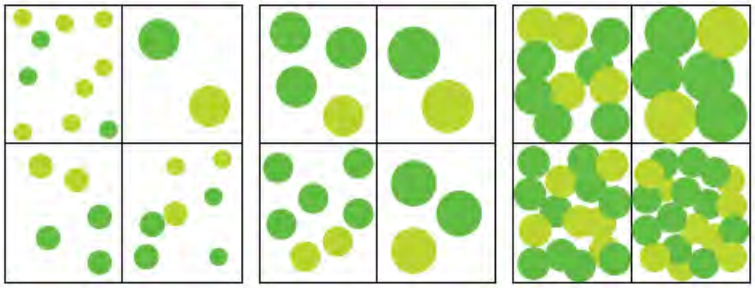


ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

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.
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*

E3: The Standards for the APZ as Established by the Local Government

Refer to the Firebreak Notice issued annually (under s33 of the Bushfires Act 1954) by the relevant local government. It may state Standards that vary from those established by the Guidelines and that have been endorsed by the WAPC and DFES as per Section 4.5.3 of the Guidelines.

A copy of the relevant annual notice is not included here as they are subject to being reviewed and modified prior to issuing each year. Refer to ratepayers notices and/or the local government's website for the current version.

E4: Maintaining Low Threat and Non-Vegetated Areas Excluded from Classification

AS 3959 establishes the methodology for determining a bushfire attack level (BAL). The methodology includes the classification of the subject site's surrounding vegetation according to their 'type' and the application of the corresponding bushfire behaviour models to determine the BAL. Certain vegetation can be considered as low threat and excluded from classification. Where this has occurred in assessing the site, the extract from AS3959:2018 below state the requirements (including the size of the vegetation area if relevant to the assessment) for maintenance of those areas of land.

2.2.3.2 *Exclusions—Low threat vegetation and non-vegetated areas*

The following vegetation shall be excluded from a BAL assessment:

(a) Vegetation of any type that is more than 100 m from the site.

(b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified vegetation.

(c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified vegetation.

(d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified vegetation.

(e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.

(f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTES:

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

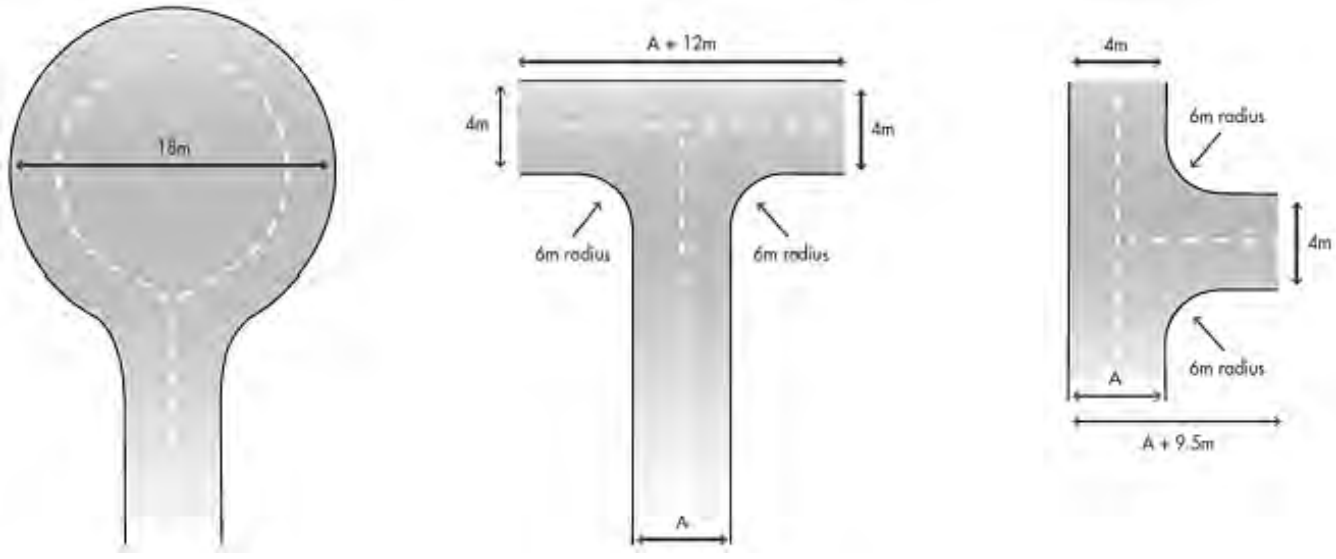
2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.

The design/layout requirements for access are established by the acceptable solutions of the Guidelines (DPLH, 2021 v1.4) Element 3 and vary dependent on the access component, the land use and the presence of 'vulnerable' persons. Consequently, the best reference source are the Guidelines. The technical requirements that are fixed for all components and uses are presented in this appendix.

GUIDELINES TABLE 6, EXPLANATORY NOTES E3.3 & E3.6 AND RELEVANT ACCEPTABLE SOLUTIONS

Technical Component	Vehicular Access Types / Components			
	Public Roads	Emergency Access Way [1]	Fire Service Access Route [1]	Battle-axe and Private Driveways [2]
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum Horizontal clearance (m)	N/A	6	6	6
Minimum Vertical clearance (m)	4.5			
Minimum weight capacity (t)	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 (m)		8.5		

Turnaround Area Dimensions for No-through Road, Battle-axe Legs and Private Driveways [4]



Passing Bay Requirements for Battle-axe leg and Private Driveway

When the access component length is greater than the stated maximum, passing bays are required every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum 6m).

Emergency Access Way – Additional Requirements

Provide a through connection to a public road, be no more than 500m in length, must be signposted and if gated, gates must be open the whole trafficable width and remain unlocked.

[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% or 7.1 degree) entry and exit angle.

[4] The turnaround area should be within 30m of the main habitable building.

G1: Reticulated Areas – Hydrant Supply

The Guidelines state "where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority."

The main scheme water suppliers / authorities in WA are The Water Corporation, AqWest – Bunbury Water Corporation and Busselton Water Corporation. Various local authority exists in other non-scheme and regional areas. However, most existing fire hydrants are connected to Water Corporation water mains.

Consequently, the hydrant location specifications from The Water Corporation's 'No 63 Water Reticulation Standard' (Ver 3 Rev 15) are provided in the extract below with the key distances relevant to bushfire planning assessments being highlighted. This Standard is deemed to be the baseline criteria for developments and should be applied unless different local water supply authority conditions apply. Other applicable specification will be found in the Standard.

Note: The maximum distance from a hydrant to the rear of a lot/building is generally interpreted as not applicable to large lot sizes where the maximum distance becomes an impractical limitation i.e., typically rural residential areas.

2.2.1.5 Appurtenances

c. Hydrants

Hydrants shall be screw-down hydrant with built-in isolation valve and installed only on DN100 or larger pipes. Hydrants shall be located:

- so that the maximum distance between a hydrant and the rear of a building envelope, (or in the absence of a building envelope the rear of the lot) shall be 120m;
- so that spacing (as measured by hose-run) between hydrants in non-residential or mixed use areas shall be maximized and no greater than 100m;
- so that spacing (as measured by hose-run) between hydrants in residential areas with lots per dwelling <10,000m^2 shall be maximized and no greater than 200m;
- so that spacing between hydrants (as measured by hose-run) in rural residential areas where minimum lots per dwelling is >10,000 m^2 (1ha) shall be maximized and no greater than 400m;
- centrally along the frontage of a lot to avoid being under driveways, unless the lot features a frontage 6m or less, in which case it shall be placed to the side opposite the driveway;
- at lots that have the widest frontage in the local area;
- where appropriate at the truncation of road junctions or intersections so that they can serve more than one street and can be readily located;
- on both sides of the major roads at staggered intervals where there are mains on both sides of the road;
- at major intersections on dual multi-lane roads, where two hydrants are to be sited on diagonally opposite corners;
- hydrants should be located at least 20m from traffic calming devices i.e., median slow points or chokers, chicanes, mini traffic circles, and intersection 'pop-outs' to ensure traffic is not impeded;
- in a position not less than 10m from any high voltage main electrical distribution equipment such as transformers and distribution boards, liquefied petroleum gas or other combustible storage;
- directly on top of the main using a tee unless proved to be impractical.

G2: Non-Reticulated Areas – Static Supply

For specified requirements, refer to the Guidelines Element 4: Water – Acceptable Solution A4.2 , Explanatory Notes E4 (that provide water supply establishment detail under the headings of water supply; independent water and power supply; strategic water supplies, alternative water sources and location of water tanks) and the technical requirements established by Schedule 2 (reproduced below).

SCHEDULE 2: WATER SUPPLY DEDICATED FOR BUSHFIRE FIREFIGHTING PURPOSES

2.1 Water supply requirements

Water dedicated for firefighting should be provided in accordance with Table 7 below, and be in addition to water required for drinking purposes.

Table 7: Water supply dedicated for bushfire firefighting purposes

PLANNING APPLICATION	NON-RETICULATED AREAS
Development application	10,000L per habitable building
Structure Plan / Subdivision: Creation of 1 additional lot	10,000L per lot
Structure Plan / Subdivision: Creation of 3 to 24 lots	10,000L tank per lot **or** 50,000L strategic water tank
Structure Plan / Subdivision: Creation of 25 lots or more	50,000L per 25 lots or part thereof Provided as a strategic water tank(s) or 10,000L tank per lot

2.2 Technical requirements

2.2.1 Construction and design

An above-ground tank and associated stand should be constructed of non-combustible material. The tank may need to comply with AS/NZS 3500.1:2018.

Below ground tanks should have a 200mm diameter access hole to allow tankers or emergency service vehicles to refill direct from the tank, with the outlet location clearly marked at the surface. The tank may need to comply with AS/NZS 3500.1:2018. An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. If the tank is required under the BCA as part of fire hydrant installation, then the tank will also need to comply with AS 2419.

Where an outlet for an emergency service vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply.

2.2.2 Pipes and fittings

All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire attack and be in accordance with the applicable section below, unless otherwise specified by the local government.

2.2.2.1 Fittings for above-ground water tanks:

- Commercial land uses: 125mm Storz fitting; or
- Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or
- Standalone water tanks: 50mm male camlock coupling with full flow valve; or
- Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires.

2.2.2.2 Remote outlets

In certain circumstances, it may be beneficial to have the outlet located away from the water supply. In such instances in which a remote outlet is to be used, the applicant should consult the local government and DFES on their proposal.

EXAMPLE CONSTRUCTION AND FITTINGS	
	
Strategic 47,000 Litre Concrete Tank & Protected Fittings	
	
10,000 Litre Concrete Tank	Storz and Camlock Couplings
	
Full Flow 50mm Ball Valve	Full Flow 50mm Gate Valve and Male Camlock

BUSHFIRE WARNING SYSTEM

EMERGENCY WARNING

An out of control fire is approaching fast and you need to take immediate action to survive. If you haven't prepared your home it is too late.

You must seek shelter or leave now if it is safe to do so.

WATCH AND ACT

A fire is approaching and there is a possible threat to lives or homes. Put your plan into action. If your plan is to leave, make sure you leave early. If your plan is to stay, check all your equipment is ready.

Only stay and defend if you are mentally and physically prepared.

ADVICE

A fire has started but there is no immediate danger. Stay alert and watch for signs of a fire.

Be aware and keep up to date.

Where can I get information during an emergency?

emergency.wa.gov.au 13 DFES (13 33 37)

@dfeswa @dfes_wa Local ABC Radio

GOVERNMENT OF WESTERN AUSTRALIA

DFES Department of Fire & Emergency Services

APPENDIX I: FIRE DANGER RATINGS – FORECAST BUSHFIRE RISK

THE HIGHER THE RATING, THE MORE DANGEROUS THE CONDITIONS AND THE GREATER THE CONSEQUENCES IF A FIRE STARTS.

BUSHFIRE RISKS AND DANGERS

BUSHFIRES HAPPEN EVERY SUMMER; THEY CAN START SUDDENLY AND WITHOUT WARNING.
If you live in or near bushland you need to understand the risks and dangers that bushfires cause.
Remember that flames are not the only risk you face in a bushfire.

EMBER ATTACK

Ember attack occurs before, during and after a fire front passes.

Embers are pieces of burning bark, leaves or twigs that are carried by the wind around the main fire creating spot fires.

Spotting can be carried over half a kilometre from a fire.

Embers can land in areas around your home such as your garden, under or in the gutters of your home and on wooden decks.

If not extinguished, your house could catch fire.

RADIANT HEAT

The hotter, drier and windier the day, the more intense a bushfire will be and the more radiant heat it will generate.

Radiant heat can cause injury and death from burns and cause the body's cooling system to fail, leading to heat exhaustion and possible heart failure.

It is important that you include water and appropriate clothing in your emergency kit and consider where you will shelter during a bushfire to protect yourself from radiant heat.

SMOKE

Lung injuries and suffocation can occur where the body is exposed to smoke and super-heated air.

It is important to seek shelter when heat and smoke are most intense.

Your nose and mouth should be covered with a dust mask, wet towel or scarf.

A special filter mask should be included in your survival kit for people in your family who suffer respiratory conditions such as asthma.

For more information visit
dfes.wa.gov.au/bushfire
or contact DFES Community Preparedness:
Community.Preparedness@dfes.wa.gov.au
or **9395 9816**

GOVERNMENT OF WESTERN AUSTRALIA
DFES Department of Fire & Emergency Services

HOW FIREPROOF IS YOUR PLAN?

TRAVELLING DURING A BUSHFIRE

BUSHFIRES CAN START WITHOUT WARNING. People have been killed or seriously injured during bushfires. If you are travelling or staying near bushland, fire is a real risk to you. **Pack an emergency kit including important items such as woollen blankets, drinking water and protective clothing.**

IF THERE IS A LOT OF SMOKE

- ◯ Slow down as there could be people, vehicles and livestock on the road.
- ◯ Turn your car headlights and hazard lights on.
- ◯ Close the windows and outside vents.
- ◯ If you can't see clearly, pull over and wait until the smoke clears.

For more information visit
dfes.wa.gov.au/bushfire
or contact DFES Community Preparedness:
Community.Preparedness@dfes.wa.gov.au
or **9395 9816**

IF YOU BECOME TRAPPED BY A FIRE

Sheltering inside a vehicle is a very high risk strategy. It is unlikely that a person will survive in all but the mildest circumstances.

- ◯ Park the vehicle off the roadway where there is little vegetation, with the vehicle facing towards the oncoming fire front.
- ◯ Turn the engine off.
- ◯ Close the car doors, windows and outside vents, and call 000.
- ◯ Stay in the car until the fire front has passed. Stay as close to the floor as possible and cover your mouth with a damp cloth to avoid inhalation of smoke.
- ◯ Stay covered in woollen blankets, continue to drink water and wait for assistance.
- ◯ Once the front has passed and the temperature has dropped, cautiously exit the vehicle.

IMPORTANT INFORMATION

- ◯ Find the local ABC radio frequency in the area. Stay up to date in a major emergency, when lives and property are at risk, ABC radio will issue broadcast warnings at a quarter to and a quarter past the hour.
- ◯ Main Roads provides updated information on road closures throughout WA. Call 138 138 or www.mainroads.wa.gov.au
- ◯ Check the weather forecast and current fire restrictions. Be aware of the Fire Danger Rating for the area you are travelling to and be prepared to reassess your plans.
- ◯ Download the Bushfire Traveller's Checklist at www.dfes.wa.gov.au

APPENDIX L: INDICATIVE BUSHFIRE BEHAVIOUR TO IMPACT THE SITE

Information Relevance: This information is included in the Bushfire Plan to inform and assist the decision making of those persons onsite who have the responsibility to manage a bushfire emergency for the subject facility/premises.

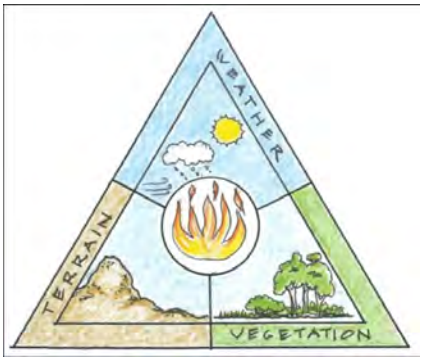
The information establishes the key factors to be considered in understanding the types and scale of key bushfire behaviours that can be expected to impact the site on a given day. These factors are the type of vegetation that exists on the land surrounding the subject premises/facility, the relevant surrounding terrain, and the forecast Fire Danger Rating (FDR) that applies to the locality.

Information Source: The information is taken from the bushfire behaviour modelling applied within the Australian Fire Danger Rating System (AFDRS). Within this system, eight accepted bushfire behaviour models, describing mathematically the way fire moves and spreads through different vegetation types, are currently available and are applied to twenty two different vegetation types across Australia.

The modelling is used to derive the Fire Behaviour Index (FBI) that assists firefighting operational decision making. From the FBI, Fire Danger Ratings (FDR) are derived which provide the broad categories needed to communicate fire danger to the community. The determination of the daily FDR considers the vegetation types present and the forecast fire weather conditions. The higher the rating, the more dangerous the conditions and the greater the consequences if a fire starts. (Source: AFDRS project led by NSW RFS, Australian Bureau of Meteorology and AFAC).

The Fire Behaviour Triangle

The behaviour of a bushfire, including the types of threats, intensity and how quickly it moves, depends on the three factors of vegetation, weather and terrain.



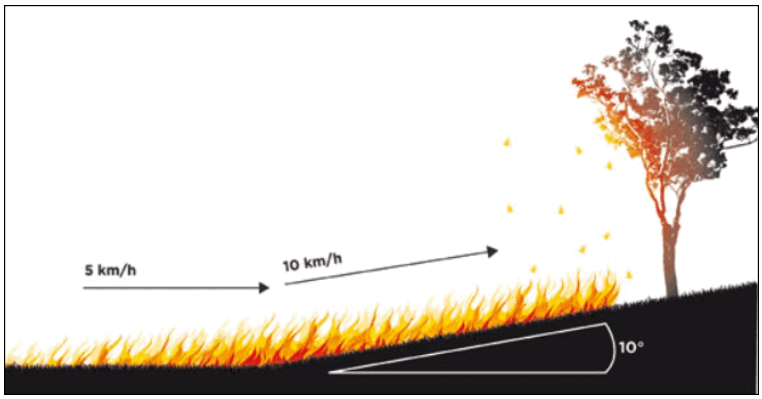
This is known as the fire behaviour triangle – because all three factors combine to shape the characteristics of the bushfire (source: CSIRO 'Bushfire best practice guide' at … research.csiro.au/bushfire/).

The influence of fire weather (FDR) and vegetation types (as per AFDRS) on the potential bushfire impact to the subject facility/premises, can be derived from the tables presented on the following page(s). Greater fuel loads will result in behaviours at the higher end of stated values.

The influence of terrain can be derived by considering the existence and degree of sloping ground and changes in changes in relief (e.g., flat, undulating or rugged land), surrounding the subject facility/premises and particularly under the vegetation.

The Influence of Terrain (topography)

A fire will burn faster uphill. This is because the flames can easily reach more unburnt fuel in front of the fire. Radiant heat pre-heats the fuel in front of the fire, making the fuel even more flammable.



For every 10˚ slope, the fire will double its speed. For example, if a fire is travelling at 5 km per hour along flat ground and it hits a 10˚ slope it will double in speed to 10 km per hour up the hill. By increasing in speed the fire also increases in intensity, becoming even hotter.

The opposite applies to a fire travelling downhill. The flames reach less fuel, and less radiant heat pre-heats the fuel in front of the fire. For every 10˚ of downhill slope, the fire will halve its speed. Fires tend to move more slowly as the slope decreases (source: Country Fire Authority, Victoria).

Terrain should be considered for its potential to increase adverse fire behaviour including flame heights, forward rates of spread and ember production (in relevant vegetation i.e., primarily bark fuels). Essentially, where vegetation exists on sloping land near your site, assume that the higher end of adverse fire behaviours is much more likely to apply.

VEGETATION TYPES IDENTIFIED SURROUNDING AND WITHIN THE SUBJECT SITE		
As Applied in the AFDRS		Vegetation Location Relative to the Site
Fire Behaviour Model (short name)	Fuel Types / Description	
Forest	Dry eucalypt forests, shrubby understorey/litter surface fuel. Forests with high moisture content due to structure, topography or inundation.	Forest areas are not prevalent in the surrounding area.
Grassy Woodland (Savanna)	Woodland and shrubland with a continuous grass understorey. Arid woodland/shrubland with short lasting (seasonal) grass understorey. Perennial woody horticulture with grass understorey (orchard/vineyard). Rural/Urban residential areas of grass with variable tree cover.	The structure of vegetation comprising medium canopy trees with shrubland and grass understorey exists on and external to the site, generally resulting from agricultural practices and historic clearing of land.
Shrubland	Temperate shrublands and heathlands of varying heights. Includes wet heathlands.	Low lying areas within the site and external to the site are made up of low shrubland interface with Scrub and Grassland.
Grassland	Continuous/tussock grasslands. Modified/native pasture (grazing). Non-irrigated cropping. Low shrublands (wet or arid) with no overstorey.	Grassland exists in the form of cropping land and pasture paddock areas within and external to the site, in the broader landscape.
Mallee-Heath	Semi-arid woodland and shrubland with shrub understorey.	The planting density and arrangement on site is likely to constitute a Scrub arrangement in its mature state.
Spinifex	Woodland and shrubland with a hummock grass understorey. Includes mallee if spinifex understorey.	N/A
Pine	Pine plantations	N/A

SAVANNA
(GRASSY WOODLAND)

THE INDICATIVE FIRE BEHAVIOUR CORRESPONDING TO THE FIRE BEHAVIOUR INDEX (0-100) AND THE ASSOCIATED FIRE DANGER RATING (FDR)

Source: AFDRS v. 2022_6

FDR	INDICATIVE BUSHFIRE BEHAVIOUR			
NO RATING	MAX FLAME HEIGHT <0.5 m	0-5	RATE OF SPREAD 0-50 m/hr	Fire difficult to ignite and sustain. Fires generally unlikely to spread and likely to self-extinguish.
	<0.5-1.5 m	6-11	<1.5km/hr	Fire easily sustained. Typically wind driven fires that can spread quickly. Fires mostly only partially consuming fuels, typically creating a mosaic of burnt and unburnt patches (decreasing patchiness with increasing intensity).
MODERATE HIGH	1.5-2.5 m	12-49	1-8 km/hr	Wind driven, rapidly spreading fires with potential for development into large fire area/size and with the potential for short distance spotting and long flame lengths. Fires typically consuming all available fuel. Increasing scorch height of tree canopy (up to 20-25 m) and char height (up to 3-4 m).
EXTREME CATASTROPHIC	>2.5m	50+	>5 and likely >8 km/hr	Extremely rapid fire growth and increasing likelihood of large final fire area/size. Possibility for fire behaviour to become erratic and plume driven. Strong convective column formation. Wind speed and direction likely to be erratic at times. Fires consuming all available fuel.

SPOTTING POTENTIAL
Potential for any spotting is extremely limited
Potential for spotting is limited
Possible short distance spotting occurring
Likely short distance spotting

SHRUBLAND

THE INDICATIVE FIRE BEHAVIOUR CORRESPONDING TO THE FIRE BEHAVIOUR INDEX (0-100) AND THE ASSOCIATED FIRE DANGER RATING (FDR)

Source: AFDRS v. 2022_6

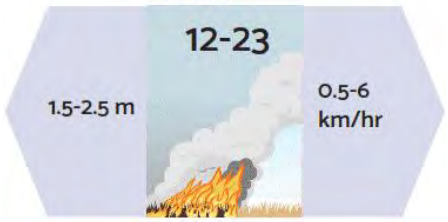
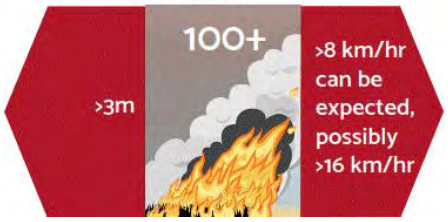
FDR	INDICATIVE BUSHFIRE BEHAVIOUR			
NO RATING	MAX FLAME HEIGHT <0.5 m	0-5	RATE OF SPREAD 0-20 m/hr	Flame dimensions are generally insufficient to breach sparse and discontinuous fuels or inter-hummock gaps.
	<0.5-1.5 m	6-11	20-150 m/hr	Sustained spread of fire.
MODERATE	1-4 m	12-23	150-1300 m/hr	Fast moving, wind-driven fires that are mostly actively crowning.
HIGH	2-8 m	24-49	up to 6.5 km/hr	Fast moving, wind-driven, crown fires with high potential for large fire areas. Mostly complete combustion of fuels and few unburnt patches.
EXTREME	>4m and likely >8m	50+	>1.5 and likely >6.5 km/hr	Rapid fire growth, extremely fast moving, wind-driven fires. High potential for large fire areas with complete combustion of fuels and few unburnt patches.
CATASTROPHIC				

SPOTTING POTENTIAL
Potential for any spotting is extremely limited
Potential for spotting is limited
Potential for spotting is limited except where eucalypt/mallee trees are present where spotting is likely to be minimal and limited
Possible short distance spotting mostly <20 m or where eucalypt/mallee trees are present where spotting is likely to be minimal and limited to short distances (<100 m). Any spot fires are typically overrun by the main head fire
Possible short distance spotting mostly <40 m except where eucalypt/mallee trees are present where spotting may be up to 200 m with spot fires typically quickly overrun by the main head fire

GRASSLAND

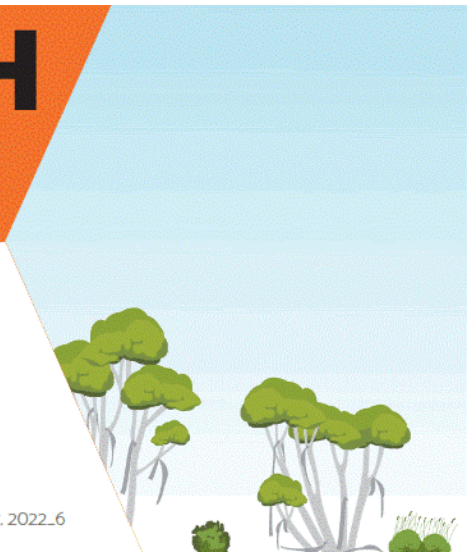
THE INDICATIVE FIRE BEHAVIOUR CORRESPONDING TO THE FIRE BEHAVIOUR INDEX (0-100) AND THE ASSOCIATED FIRE DANGER RATING (FDR)

Source: AFDRS v. 2022_6

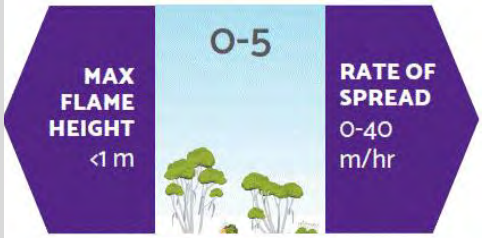
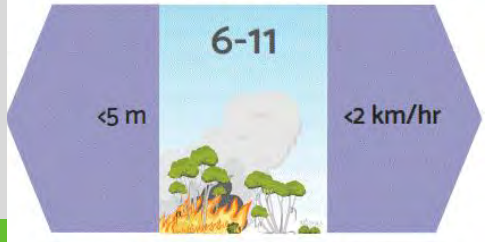
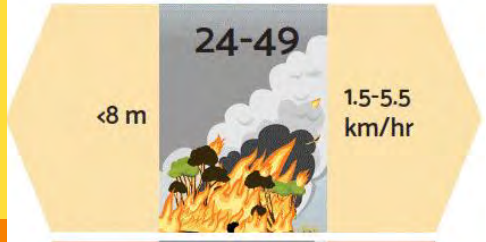
FDR	INDICATIVE BUSHFIRE BEHAVIOUR		
NO RATING		Fire difficult to ignite and sustain. Fires generally unlikely to spread and likely to self-extinguish.	**SPOTTING POTENTIAL** Potential for any spotting is very limited.
		Fire easily sustained. Typically wind driven fires that can spread quickly.	Potential for spotting Potential for short distance spotting is limited.
MODERATE		Typically wind driven and rapidly spreading fires with the potential to gain size quickly.	Possible short distance spotting occurring.
HIGH		Wind driven, rapidly spreading fires with potential for development into large fire area/size and with the potential for short distance spotting and long flame lengths.	Short distance spotting occurring with increasing frequency.
EXTREME		Extremely rapid fire growth and increasing likelihood of large final fire area/size. Possibility for fire behaviour to become erratic and plume driven. Strong convective column formation. Wind speed and direction likely to be erratic at times.	Likely short distance spotting occurring with increasing frequency.
CATASTROPHIC		Extremely rapid fire growth and high likelihood of large final fire area/size. Possibility for fire behaviour to become erratic and plume driven. Strong convective column formation. Wind speed and direction likely to be erratic at times.	Likely short distance spotting occurring with increasing frequency.

MALLEE-HEATH

THE INDICATIVE FIRE BEHAVIOUR CORRESPONDING TO THE FIRE BEHAVIOUR INDEX (0-100) AND THE ASSOCIATED FIRE DANGER RATING (FDR)



Source: AFDRS v. 2022_6

FDR	INDICATIVE BUSHFIRE BEHAVIOUR		
NO RATING		Probability of self-sustained, surface fire is low.	**SPOTTING POTENTIAL** Potential for any spotting is extremely limited
		Surface fires whereby the flame front is able to overcome fine scale fuel discontinuities. Isolated torching of overstorey fuels.	Short range spotting possible up to 10 m
MODERATE		Intermittent crown fire. The passage of the flame front on surface fuels is followed by torching of overstorey fuels. Canopy fuel combustion occurs somewhat behind the leading edge of the flame front. Average flame front properties not affected by the level of torching and rate of fire spread largely determined by surface phase.	Short range spotting up to 50 m likely, allowing fire to cross small areas of fuel discontinuity such as roads or small fuel breaks
HIGH		Active or dependent crown fires with crown phase determining the overall rate of spread. Fire propagates faster than observed for a surface or intermittent crown fire under same environmental conditions. A reduction of the surface phase heat output below a certain level will lead the fire to an intermittent crown fire regime1.	Escalation in fire activity is typically accompanied by an increase in the number of firebrands generated and possible distances >50 m ahead of the flame front
EXTREME		Active or dependent crown fire.	Escalation in fire activity is typically accompanied by an increase in the number of firebrands generated and possible distances >50 m ahead of the flame front
CATASTROPHIC			

APPENDIX M: LANDSCAPING DESIGN & CONSTRUCTION PRINCIPLES TO APPLY

Where initial or renovation landscaping of grounds surrounding buildings and assets of value is being conducted, apply the directions and principles of the following measures to the greatest extent possible.

For additional guidance, refer to:

- The *Guidelines for Planning in Bushfire Prone Areas within the Explanatory Notes for Element 2 of the Bushfire Protection Criteria and Schedule 1: Standards for Asset Protection Zones (WAPC 2021); and*
- The DFES '*Bushfire Preparation Toolkit'* publication. Website: publications.dfes.wa.gov.au/?hazard=Bushfire

☐ Use of Non-Vegetated Areas:

Reduce the exposure of the facility/premises to the direct and indirect threats of bushfire by incorporating low threat uses of land adjoining the facility/premises and/or the bushfire hazard. These uses create robust and easier managed asset protection zones and include:

- Non-vegetated areas e.g. footpaths, paved areas, roads, driveways, parking, drainage.
- Formally managed areas of vegetation (public open space and other recreation areas), including irrigated areas; and
- Services installed in a common section of non-vegetated land.

☐ Landscaping – Non-Combustible Construction: Ensure non-combustible materials are used for fencing and any other landscaping construction, including retaining walls.

☐ Landscaping – Tree and Plant Species Selection

Utilise trees and plants with characteristics that are more resistant to burning. Refer to *Guidelines for Planning in Bushfire Prone Areas, Appendix 4 'Explanatory Notes E2: Plant Flammability' (WAPC 2021) for initial guidance*.

Avoid planting trees with ribbon or stringy barks (ember/firebrand production). Preference for smooth bark.

☐ Landscaping – Tree and Plant Separation from Buildings/Assets of Value (Location):

Trees (greater than 6 metres in height: Minimise the potential for tree strike damage (falling or blown) to the buildings/assets of value (allowing flame, radiant heat and ember entry to internal spaces), and debris accumulation on, in and around the facility/premise. Principles to apply are:

- Ideally trees will be separated from buildings/structures by a distance of at least 1.5 times the height of the tallest tree;
- As a minimum, trunks at maturity should be at least 6 metres from all elevations of the building, branches at maturity should not touch or overhang a building or powerlines. Mature tree canopies should be separated at least 5m with total canopy cover not exceeding 15% and not connected to tree canopy outside the APZ;
- Species of trees that produce significant quantities of debris (fine fuels) during the bushfire season should be located a sufficient distance away from vulnerable exposed elements to ensure debris cannot drop and accumulate within at least 4m of buildings/structures or be likely to be relocated by wind to closer than 4m to buildings / structures.

Shrubs and scrub (0.5 metres to 6 metres in height):

- Should not be located under trees or within 3 metres of buildings;
- Should not be planted in clumps greater than 5m^2 in area;
- Clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres (unless they can be classified as low flammability plants); and
- Shrubs greater than 6 metres in height are to be treated as trees.

Ground covers (less than 0.5 metres in height):

- Can be planted under trees but and no closer than two metres from a structure but 3 metres from doors or windows if greater than 100 mm in height; and
- Ground covers greater than 0.5 metres in height are to be treated as shrubs.

Grass: Where possible utilise irrigated perennial species.

Mulches should be non-combustible e.g., stone, gravel and crushed rock. Where wood mulch is used it should be greater than 6mm in thickness.

☐ Separation Between the Buildings/Assets of Value and the Consequential Fire Fuels of Stored Flammable Products (Fuels / Other Hazardous Materials):

If applicable, establish sufficient separation distance between the consequential fire fuels and the facility/premises. The required separation distance will be dependent on the fuel and storage type and will need to be determined.

☐ Separation Between the Buildings/Assets of Value and the Consequential Fire Fuels of Stored and Constructed Combustible Items:

These consequential fire fuels include:

- Stored Combustible Items - Heavy Fuels (greater than 6mm diameter) e.g. building materials, packaging materials, firewood, branches, sporting/playground equipment, outdoor furniture, garbage bins etc:
- Stored Combustible Items – Large Heavy Fuels e.g. vehicles, caravans, boats, trailers and large quantities of dead vegetation materials stored as part of site use.
- Constructed Combustible Items – Heavy Fuels e.g. landscaping structures including fences, screens, walls, plastic water tanks.
- Constructed Combustible Items – Large Heavy Fuels e.g. adjacent buildings/structures including houses, sheds, garages, carports. (Note: If the adjacent structure is constructed to BAL-29 requirements or greater and can implement a significant number of additional bushfire protection measures associated with reducing exposure and vulnerability, these minimum separation distances could be reduced by 30%).

Apply the rule of thumb "assume flames produced from a consequential fire source will be twice as high as the object itself … where the consequential fire source is a structure, then the maximum eave height is a reasonable measure of maximum height".

Apply the following separation distances from the subject building/structure as a multiple of the height of the consequential fire source and dependent on the bushfire construction standard applied to the building/structure:

- At least six times the height when the facility/premises construction incorporates design and materials that is only intended to resist low levels of radiant heat up to 12.5 kW/m^2 and no flame contact (BAL-12.5);
- Between 4 and 6 six times the height when the facility/premises construction incorporates design and materials intended to resist radiant heat up to 29 kW/m^2 and no flame contact (BAL-29).
- Between 2 and 4 times the height when the facility/premises construction incorporates design and materials intended to resist up to 40kW/m^2 and potential flame contact (BAL-40).
- Less than 2 times the height when the facility/premises construction incorporates design and materials intended to resist extreme levels of radiant heat and flame contact (BAL-FZ).
- Zero separation distance is required if the facility/premises is separated by a non-combustible FRL 60/60/60 rated wall, or the potential consequential fire source is fully enclosed by the facility/premises.

☐ Constructed Barriers to Shield Buildings/Assets of Value from Bushfire: Where applicable, install walls, fences and/or landforms to shield the buildings/Assets of Value (or any identified consequential fire fuels – refer to previous item) from direct and indirect bushfire attack mechanisms and reduce the potential impact of these threats.

These barriers should be constructed using appropriate fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period.

- ☐ Constructed Barriers to Shield Buildings/Assets of Value from Consequential Fire: Applicable to all identified consequential fire fuel sources. Install a non-combustible barrier (including complete enclosure when appropriate), of required robustness, that will reduce the exposure of the buildings/assets of value to the threats of consequential fire.

- ☐ Planted Vegetation Barrier to Shield Buildings/Assets of Value: Use appropriate species (lower flammability) of hedges and trees strategically to reduce the buildings/assets of value exposure to radiant heat, to filter/trap embers and firebrands, and to lower wind speeds (prevailing synoptic and/or fire driven).

- ☐ Shield Non-Structural Essential Elements: These are vulnerable elements essential to the continued operation of the buildings/assets of value which are potentially exposed to the fire attack mechanisms of both bushfire and consequential fire. They include electricity cabling and water plumbing and also applies to any installed firefighting equipment / water storage.

  When the use of fire rated materials to the degree necessary is not possible or practical, the application of non-combustible shielding can be applied to reduce exposure to the bushfire threats. Shielding includes underground installation.