SHIRE OF JERRAMUNGUP

ATTACHMENTS

AGENDA ITEM 9.3.1
PROPOSED PLANTATION – PLANNING APPLICATION

ORDINARY MEETING OF COUNCIL
24 May 2023

Ediegarrup Restoration Planning Application (Annexure 2)

BHA Reserve Ownership

Bush Heritage Australia is an independent not-for-profit, established in 1991, that acquires and manages land for conservation and works in partnerships with Aboriginal people and the agricultural sector, to protect our irreplaceable landscapes and our magnificent native species forever. Throughout Australia, Bush Heritage currently protects 1.2million hectares of land through our reserve system and partner with Aboriginal people to help manage a further 10 million hectares.

In Southwest Australia, one of earth's most ancient landscapes, uninterrupted evolution for tens or hundreds of millions of years, has created a flora that may well be the most diverse on the planet. The Fitz-Stirling landscape lies within the Southwest Australia Global Biodiversity Hotspot, one of only two globally recognised biodiversity hotspots in Australia, between the Fitzgerald River and Stirling Range National Parks. A global biodiversity hotspot is an area with an exceptional concentration of endemic species (>1,500 endemic species of plant) that have experienced considerable loss of habitat (>70% habitat loss).

The Fitz-Stirling is located on the Country for Goreng people of the Noongar Nation and is part of a strong cultural landscape. Conservation of the Fitz-Stirling reserves is focused on managing and protecting the ecological and cultural values on the properties in partnership with the Noongar people.

An unfortunate State sponsored scheme in the decades following World War II released vast tracts of infertile and fragile landscape in Southwest Australia to agricultural land uses instigating habitat fragmentation and ecological decline. Bush Heritage Australia is one of many organisations and individuals working across the southwest since the turn of the millennium to arrest and reverse this decline through application on the ground of connectivity conservation principles. Our focus is on the 70-kilometre-long tract of country between the Stirling Range and Fitzgerald River National Parks ('the Fitz-Stirling'). Our connectivity conservation recipe is simple:

1. Protect remnant bushland;
2. Implement landscape-scale ecological restoration; and
3. Work with traditional owners, neighbours and the local community to maintain our social licence to operate in a 'working landscape'.

The second of these, landscape-scale ecological restoration, is the strategy most critical to achieving the broad vision of reconnected country, and is a core focus for BHA's program in the SW of WA.

For the past two decades, Bush Heritage has been working in the Fitz-Stirling to purchase, protect and restore remnant bushland and revegetating cleared areas of land to reconnect the Stirling Range and Fitzgerald River NationalParks. Work initially started in 2003 with the acquisition of Chereninup Creek Reserve and restoration of its cleared areas. Over the following years additional properties were acquired, some wholly by Bush Heritage and others in partnership with Greening Australia. Established reserves include Chereninup Creek, Monjebup, Monjebup North, Red Moort, Ediegarrup and Beringa Reserves that collectively cover an area of 6,330ha.

Partnerships have also been established with other landowners on Chingarrup Sanctuary, Nyoolbilyang Martup and Yarraweyah Falls covering an area of 2,216ha. A further 2,877ha of conservation estate is also managed by Greening Australia and Nowanup Aboriginal Corporation, partners with Bush Heritage in the restoration of Ediegarrup Reserve. In total there is over 11,000ha of privately managed conservation estate within the Fitz-Stirling corridor, in addition to the 11,000ha of Conservation Reserves managed by Department of Biodiversity Conservation and Attractions (Figure 1). The properties range from primarily bush blocks through to a mixture of bushland and cleared areas that have been restored. Restoration projects have been implemented either by Bush Heritage, Greening Australia or others, to extend connections and expand habitat.

Project Background

Bush Heritage Australia has been a leader in progressing the connectivity between the Stirling Range and Fitzgerald River National Parks, with a focus on connectivity of existing BHA reserves to the surrounding bushland and reserve networks.

In early 2022, BHA purchased Ediegarrup as a strategic acquisition to its estate as it was determined to provide an excellent opportunity to connect Red Moort Reserve, currently surrounded by cleared agricultural land, to other important remnant bushland areas. The fact that over 300ha of the property was already covered with remnant bushland, along with a further 100ha of plantation timber, meant that only 600ha of the property was cleared. This fact, along with a marginal agricultural capacity, meant that the restoration of the property with native vegetation found in the local environment was the most feasible option to progress connectivity between Red Moort Reserve and other bushland areas within the landscape.

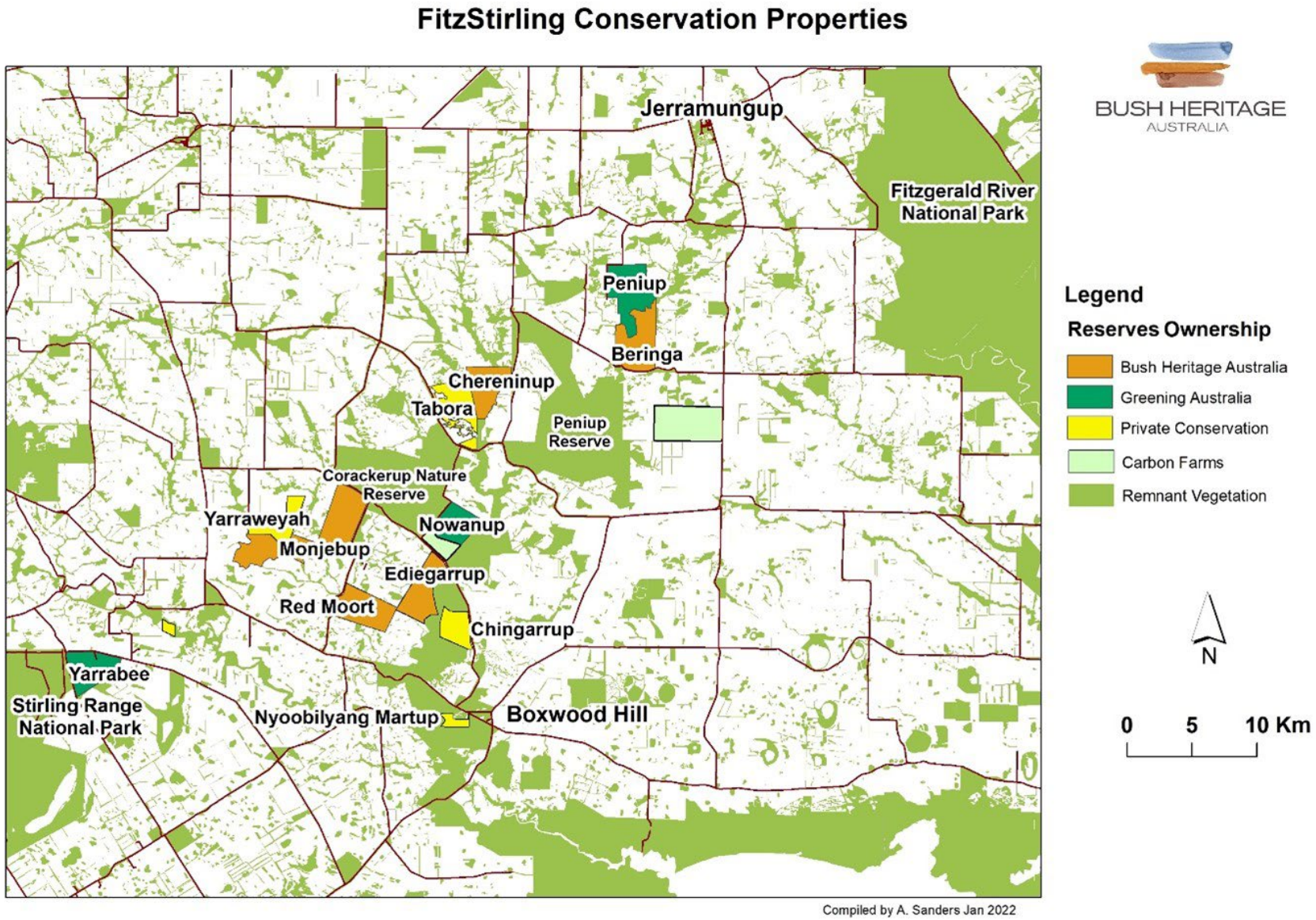


Figure 1: Fitz-Stirling Conservation Properties

Figure 2: Ediegarrup Location Context Plan

Proposal

The proposal for Ediegarrup Reserve, located at 1287 Boxwood Hill-Ongerup Road, Boxwood Hill, WA 6337 (Lot. 1854 of Kent as shown in Figure 2) is to revegetate the 600ha of cleared area on the property with a biodiverse mix of local native species to provide connectivity between large remnant bushland areas to the east and west and establish habitat values that will promote sustainability of native species in the area.

Bush Heritage Australia has partnered with Greening Australia to plan and deliver a world class restoration project that will both sequester carbon and improve ecological outcomes both on the property and in surrounding bushland and reserves. The proposed revegetation strategy will be delivered over three years (Figure 3), commencing in winter 2023, to ensure sufficient resources are available to deliver the project at a high standard and manage weeds and pest animals including rabbits.

The project will involve direct seeding of the site with a mix of suitable native species followed by planting of seedlings propagated in a nursery. Appropriate weed control will be conducted before and after planting and will be closely monitored and managed to deliver a successful restoration. Habitat piles, including rock and log structures, will be installed at strategic sites throughout the revegetation area to provide suitable cover for native species that will enhance the vegetation structure that will develop over time.

Bush Heritage and Greening Australia will work with Aboriginal partners, particularly with the Nowanup Aboriginal Corporation, to help plan and deliver the revegetation project and continue to manage the site in the future. We are currently pursuing a Cultural Heritage Survey of the site and discussing opportunities to further work alongside the Wagyl Kaip Aboriginal Corporation to advance the objectives of the Noongar people in Caring for Country in the area.

The project plan and design is based on matching vegetation communities with soil types to ensure greatest success and reflection of pre clearing habitat and structure. The site is critical to establish connectivity between Red Moort Reserve and other large remnant areas of bushland to the east and north of the property. The agricultural viability of the property is marginal and hence affords a good strategic site on which to undertake such a restoration project without sacrificing quality agricultural land from the region.

Bush Heritage and Greening Australia have successfully completed several revegetation projects of a similar scale and diversity that have managed to address all of the important elements of restoration and ongoing management including but not limited to fire management, weed and pest animal control, ongoing monitoring and maintenance and community and stakeholder engagement. An example of one such project is Monjebup North located on the corner of Monjebup Rd and Boxwood Hill-Ongerup Rd in the Shire of Gnowangerup. This project site consists of >400ha of biodiverse restoration with a species diversity, reflecting surrounding bushland vegetation communities. The site was carefully planned with adequate access tracks, suitably sized planting cells and water supply for fire management. Revegetation was undertaken between 2012-2014 with several small scale infill planting to areas that required it since that time. This site is now home to breeding Malleefowl, provides forage trees for large flocks of the endangered Carnaby's Cockatoo and provides shelter and habitat for a range of other species including honey possum, western pygmy possum, western whipbird and a range of reptiles and frogs.

Bush Heritage Australia have actively managed the site over the past decade or more and have regular contact with neighbours to understand and address any issues that may arise.

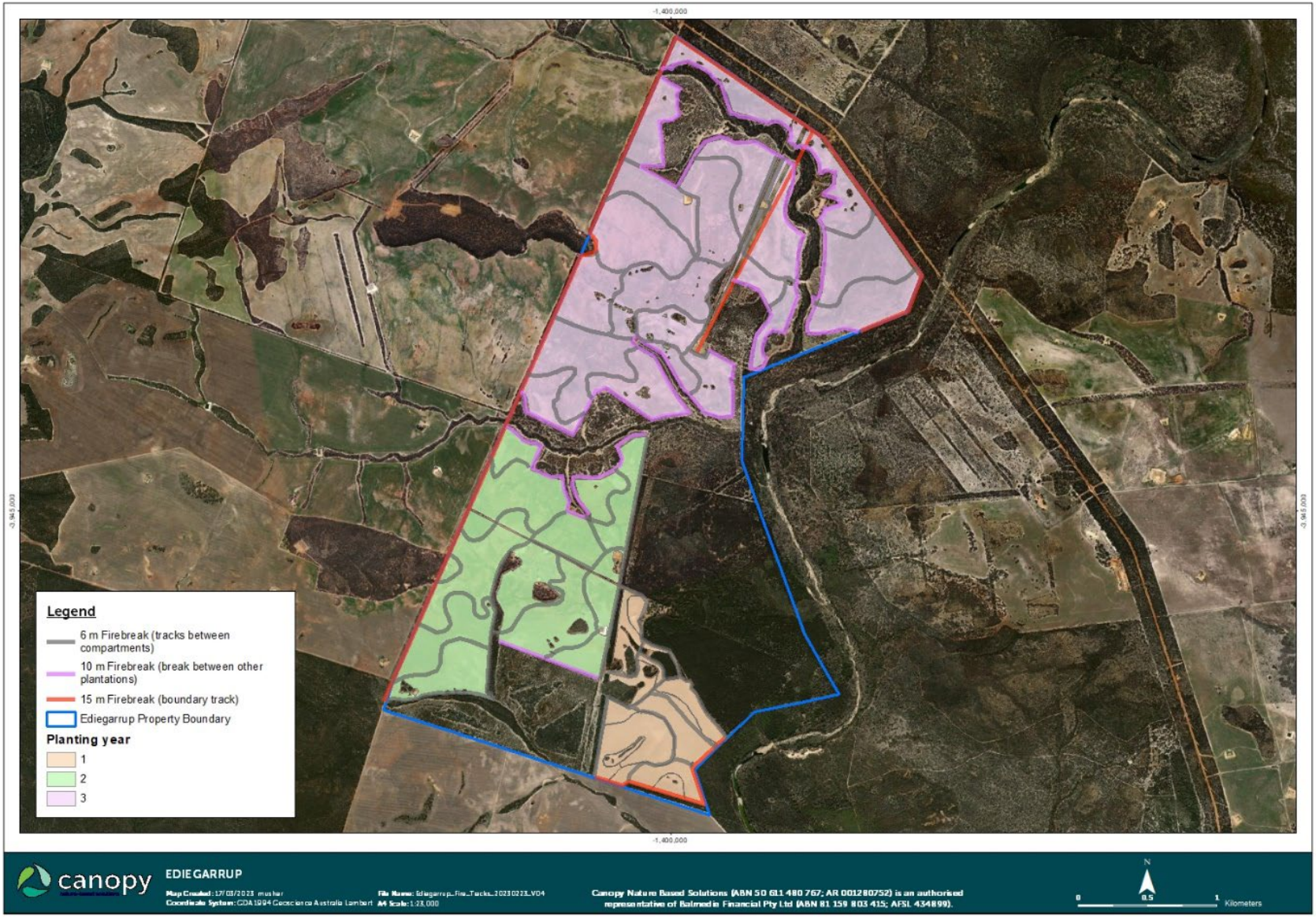


Figure 3: Ediegarrup Plantation sequence and tracks/firebreaks

Scheme Requirements

This Development Application is aimed at addressing the requirements of the Local Planning Scheme No 2 as outlined in the Shire of Jerramungup Local Planning Policy No 10 – Agroforestry and Plantations (LPP No 10).

While restoration of cleared areas to native bushland, particularly when based on specific vegetation communities that exist on or surrounding the property, is not truly a plantation, under the definitions outlined in the LPP No 10, Carbon plantations will be processed the same as more traditional plantations.

The plantation over the 600ha of cleared land on Ediegarrup is planned to be registered as an Emissions Reduction Fund project (Carbon sequestration planting) and has a Permanence period of 100 years, effectively meaning it will not be harvested and will remain a permanent landuse change.

The plantation area has been planned to comply with the *Code of Practice for Timber Plantations in Western Australia*.

A Plantation Management Plan is attached to this Application.

Policy Requirements

Continuing Agricultural Activities

The LPP No 10 outlines the Council's desire for traditional agricultural activities to remain the predominant landuse. It further outlines that "*Council will not generally support the planting of whole lots or farms for tree planting"* due to the potential displacement of agricultural pursuits, rural population and loss of agricultural land.

The proposal will not result in diminished population as there are and have not been residential premises onsite. The property has been leased for at least the past 5 years and as described in the Attached Ediegarrup Land Viability Report (Appendix 1), is considered poor to marginal as agricultural land and would require significant investment to enable even a low profit margin.

As demonstrated by our commitment to manage property within the region over the past 20 years, Bush Heritage will continue to actively manage Ediegarrup into the future along with the other properties owned and managed by the organisation.

Compatibility with Adjacent Land Uses

Ediegarrup is located in a rural setting well away from townsites and rural/residential blocks, with the closest townsite of Boxwood Hill being 13km to the SE of the property. To the best of our knowledge there are no nearby areas zoned or proposed as residential or rural residential properties or any commercial premises.

No negative visual impacts will result from the proposed development. If anything, the amenity of the local area will improve with the return of native vegetation communities local to the area.

The proposal will have no impact on local road networks as there will be no planned harvesting activities onsite.

The proposal will lend itself to the development of a walk trail between the Michael Tichbon Field Station at Red Moort Reserve, through Ediegarrup and on to Nowanup, an initiative that has been discussed with Nowanup Aboriginal Corporation over the past few years. This will offer a positive tourism and recreational use for the area in years to come. Moreover, Bush Heritage regularly engages with community to visit our reserves to assist with conservation activities, understand

ecological benefits of restoration and undertake recreational pursuits including bush walking. During the revegetation program, community planting days will also provide opportunities for community members to be involved and participating in conservation-based activities.

The compatibility with neighbouring properties can be demonstrated on two fronts. Firstly, the connectivity with adjoining nature reserves; and secondly, with the collaboration with neighbouring landholders to undertake pest animal control as part of our Fauna Recovery Project.

Ediegarrup is surrounded by both public and private conservation reserves (Figure 1). Red Moort (a Bush Heritage reserve) to the South West, Chingarrup Sanctuary (A Bush Heritage partner private reserve) to the East, Nowanup (Managed by the Nowanup Aboriginal Corporation to the North) and Corackerup Nature Reserve (Managed by DBCA) to the North West. The Unallocated Crown Land located immediately to the East of Ediegarrup is managed by the Department of Water and Environmental Regulation, but is earmarked as possible for handover to the Noongar Boodja Trust as part of the recently agreed Native Title Settlement. These neighbouring properties all have conservation outcomes that drive their management and are completely compatible with the proposed development. Other neighbours to the west and south of Ediegarrup operate traditional farming enterprises.

Bush Heritage Australia has led a Fauna Recovery Project over the past 3 years, targeting feral animal control on key conservation areas and neighbouring properties. Thirteen private landholders covering traditional Agricultural farms over 21 separate titles have partnered with Bush Heritage, allowing our staff and contractors to undertake feral animal controls including baiting, trapping and shooting programs for feral cats, foxes and rabbits. These controls are also being delivered on private farms as well as on Bush Heritage reserves and working alongside DBCA who manage the predator control effort of Corackerup and Peniup Nature Reserves.

Through this project, Bush Heritage has demonstrated a commitment to working alongside neighbouring farmers to reduce the impacts associated with feral animals, create economic benefits within the district and establish and maintain good working relationships with our neighbours. This project is a good example of our commitment to maintain our social licence to operate in a 'working landscape'.

Letters of support for this initiative have been provided by a number of our partners, demonstrating the positive contribution Bush Heritage makes to working with the community that lives and operates in the area (Appendix 3).

Economic Benefits

Despite not being considered a traditional farming enterprise, the establishment of native vegetation for restoration and carbon capture, mean there will be an income to support ongoing management of the property into the future. Bush Heritage works closely with local businesses and providers to purchase services and products relevant to the management of the Property, including maintenance of tracks and firebreaks, weed and pest control and fire management and equipment. Our staff are regularly onsite to undertake these management actions and actively monitor the site for weeds, pests and progress towards conservation outcomes.

Over the past decade, Bush Heritage has invested well over $5 million (excluding the purchase of new properties) in managing the reserves and developing infrastructure that promotes the ability to manage conservation reserves in the region.

The establishment of the Michael Tichbon Field Station on Red Moort Reserve at a cost of approx. $1 million, is a perfect example of the economic development Bush Heritage has promoted in furthering our programs and supporting other conservation groups and initiatives being delivered within the Shire. Since opening the Field Station in 2018, over 3,000 people have stayed at the facility, including staff, volunteers, researchers, conservation supporters, schools and government representatives. With a new walk trail being planned on Red Moort and the opportunity to connect it up to Nowanup via Ediegarrup, it will offer a perfect opportunity to showcase the conservation and restoration initiatives being delivered in the region and also offer opportunities for Nowanup Aboriginal Corporation and the Noongar rangers to develop Cultural tourism options.

The establishment of native bushland on Ediegarrup will not diminish population of the local community as previously stated, and it will provide other benefits including assisting agricultural productivity for neighbouring properties by stabilising soils, actively managing pests and weeds and reducing the water table that expresses salinity.

Environmental Benefits

The environmental benefits of this project are the easiest to demonstrate. Establishment of local native species to provide habitat for threatened species including the Malleefowl and Carnaby's Black Cockatoos. Connectivity of large remnant bushland areas to provide habitat, capacity for small mammals to move across the landscape and also promote a resilient landscape in the face of climate change impacts are some that emerge as obvious.

The impacts of climate change are being felt globally and scientific research indicates that SW WA will be one of the most highly impacted areas due to reduced rainfall and increasing temperatures. The Australian Government recently announced a commitment to achieve net zero emissions by 2050. The Shire of Jerramungup's Community Plan 2016-2026 outlines the Shire's commitment to "*facilitate community programs and initiatives that deliver best practice environmental planning, management and Mitigate the impacts of Climate Change"*. These commitments are both noble and urgent and require cooperation between public and private sector to deliver on these outcomes. However, reduced emissions alone will not achieve these outcomes and the ability to sequester carbon at scale is still a very integral part of the required climate mitigation measures. This project can show that multiple environmental outcomes can be delivered with good planning, delivery and a commitment to best practice management moving forward.

The work of Bush Heritage, Gondwana Link, Greening Australia and other NRM groups in the region have been progressing an ambitious, but worthy, aim of connecting the fragmented landscape between the Fitzgerald River and Stirling Range National Parks over the past two decades. Bush Heritage has been a leader in this initiative, purchasing and managing five separate properties covering over 6,000ha and partnering with other private conservation groups managing a further 5,000ha. The restoration of Ediegarrup would provide a critical link in this connectivity program and enable access to both the Est West Corridor, but also the North south corridor towards the Pallinup Estuary and adjoining Coastal reserves.

Revegetation of Corackerup Catchment to reduce salinity and erosion and ongoing impacts to the Pallinup river and estuary are also important economic and environmental drivers relevant to this project.

Code of Practice for Timber Plantations in WA

The proposed project complies with the Code of Practice for Timber Plantations in WA and will meet the minimum standards outlined in the Code.

Fire Management Plan

A Bushfire Management Plan (Appendix 2) has been established for the site and sets out the required package of bushfire protection measures to lessen the risks associated with a bushfire event.

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

The relevant documents referenced for the bushfire management plan incorporate both site operational component and the planning requirements of:

- Compliance with applicable local government legislation obligations. State Planning Policy 3.7 and the associated Guidelines for Planning in Bushfire Prone Areas
- Department of Fire and Emergency Services (DFES) Guidelines for Plantation Fire Protection (as agreed upon by the Forest Industries Federation of Western Australia (FIFWA)).

And consideration to:

- Australian Government Clean Energy Regulator requirements for proponents to manage the risk of bush fire in Emissions Reduction Fund vegetation projects.

Subsequent operational documentation such a planned (prescribed) burning programs, pre-incident planning and fuel load management plans will form part of the 'day to day' operations on the site, which are in additional to Planning documentation for the development application.

Water Quality and Buffers to Water Bodies (creeklines)

Water quality of nearby waterbodies and creeklines will not be impacted by the plantation as no fertiliser and limited chemicals for weed and pest control will be applied as part of the plantation development. In fact, the establishment of the natural vegetation proposed in this application will likely improve water quality entering the creeklines due to the removal of sheep from the property and stabilisation of soils.

Plantation Management Plan

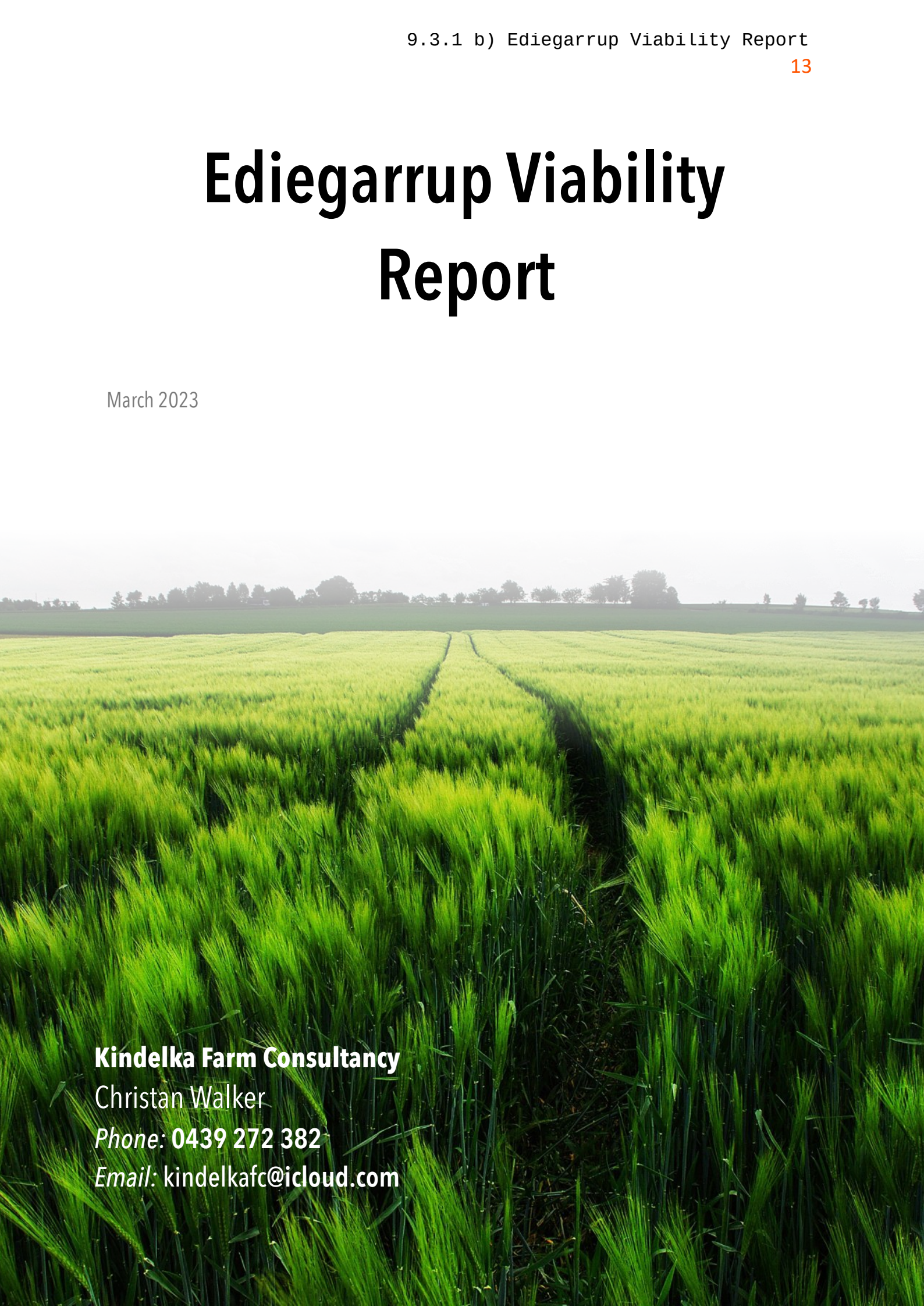
A plantation plan has been prepared and outlines the establishment and maintenance of the plantation, weed and pest control and planting details (Appendix 4).

Suitability of the Current and Future Road System (for Harvesting Only)

No harvesting is proposed for the plantation at Ediegarrup, hence the impact on the road network is not relevant to this application.

Ediegarrup Viability Report

March 2023



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Property Details

Property Name and Address: Ediegarrup
Loc 1854 of Kent
1287 Boxwood Hill- Ongerup Road,
Boxwood Hill, WA, 6337

Owner: Bush Heritage Australia

Total Ha: 1067

Arable Ha: 600

Infrastructure: 3 stand shearing shed in good condition, 1 bay machinery shed in fair condition and 1 machinery shed in very poor condition

Current pastures: annual ryegrass, brome grass, barley grass, variety of thistles and other summer and winter weeds. There is minimal to no clover.

Water: Average. There are 10 dams on the property, 3 are unreliable with one having structural damage with the remainder being adequate. There are no facilities for spray water.

Fencing: Internal fencing average, boundary fence is average to poor.

Soil Test Analysis

The soil tests collected by Great Southern Geotechnics and analysed by CSBP in August and September 2022 gave the results provided in Appendix B.

This analysis shows the following:
- N levels are low over the whole farm
- 26% of sites showing a P deficiency the remaining are adequate
- 43% of sites showing a K deficiency
- 57% of sites are deficient in S
- pH is a significant issue at 50% of the sites and 21% are average.

Current Usage

The land is currently being leased out at $128 an arable hectare. This is a grazing only lease. Other grazing leases within close proximity on properties that have better soil fertility and better pastures are currently being leased for $150 an arable hectare.

Developed productive properties in this area are fetching a cropping lease in excess of $200 an arable hectare giving an indication of the state of the property.

Viability of current situation:

For the current situation to be sustainable there would need to be a water source improvement program and an annual liming program entered into. As per the soil tests in Appendix B 50% of the farm will need a program to apply on average 3T/ha of lime over a 5 year period (cost $22 per T of lime/ $60 cartage/ $20 spreading per hectare). There will need to be a fencing program implemented of at least 2km a year ($5000 per km cost) with a precedence on the remnant bush along the Corackerup River Reserve. This fencing and lime program would only protect the current leasing income. The operational costs include administration costs, labour costs and other overhead costs.

Current situation	annual per hectare costs/income
Lease Income	128
Costs	
Operational, rates, firebreaks, insurance	75
Water source improvement	30
Fencing program and building upkeep	30
Liming program	20
Total costs	155
Profit/Loss	**-27**

This is showing the current situation is not sustainable long term given this loss per arable hectare is on an annual basis.

Improve Pastures for Lease

To increase the grazing lease income there would need to be work done to improve pastures and improve the infrastructure.

Viability to Improve Pastures for Lease:

This would require a pasture regeneration program which would be a 5 year process on top of a liming, fencing and water source upgrade programs. The property has been grazed for a number of years and this has caused compaction issues therefore there would need to be some sort of cultivation program and significant gypsum program.

Improve Pasture	annual per hectare costs/income
Lease Income	150
Costs	
Pasture regeneration program	50
Cultivation costs	30
Operational, rates, firebreaks, insurance	75
Water source improvement	30
Fencing program and building upkeep	30
Liming program	20
Total costs	235
Profit/Loss	**-85**

This shows that the increase in costs would be prohibitive to improve pastures so as to ascertain an increased lease income. The loss would be $85 per arable hectare and is not sustainable long term.

Operational Grazing Option

Another option is for Bush Heritage to purchase livestock and run an operational grazing business.

Viability to run an Operational Grazing Entity:

This would require purchasing 1800 mated ewes, which for this viability study we have depreciated over a 5 year period. It would also require a pasture regeneration program, liming program, cultivation program, re-fencing program and water source improvements.

The initial stocking rates would be at the current levels of 3DSE with the goal to be at 6DSE within 5 years. This model will be a fat lamb enterprise so as to simplify logistics. The assumptions used are 100% lambing rate and $150 per head per lamb. There are 400 ewe lambs retained to increase ewe flock to 6DSE within 5 years. A gypsum program would be required at 2.5T/ha over 120 hectares which we have depreciated over 5 years. The costs are calculated at the current rates, with gypsum at $30/t and cartage at $40/t and spreading costs at $20/t.

Improve Pasture	annual per hectare costs/income
Lamb income (1400@$150)	350
Costs	
Pasture regeneration program	50
Ewes (1800@$120) depreciated over 5 years	72
Fertiliser	77
Gypsum program	3.5
Ag chemical	16
Cultivation costs	30
Operational, rates, firebreaks, insurance	75
Water source improvement	30
Fencing program and building upkeep	30
Liming program	20
Total costs	403.5
Profit/Loss	**-53.5**

The table above indicates this option is also not viable, it is showing a loss of $53.50 per arable hectare per year. None of the grazing options either lease or operational are viable over a 5 year period. In these calculations there are no allowances for losses of stock, which is likely as the property has significant populations of poison plants. Further diminishing the chances of these options returning a profit.

Cropping Options

Planfarm benchmarking figures show that the most profitable farms in the district crop 80% of their farms. The two cropping options that we will do a viability calculation for are a cropping lease option and an operational cropping entity option.

Cropping Lease Option

The current condition of the property is not a cropping lease option due to the lack of soil fertility. It has been put to the market and no crop lease was attained. The crop leasing option will require a liming and gypsum program. The lease rate would have to be decreased from the normal crop lease rate due to the increased fertiliser requirement. The usual crop lease rate for a property with a good fertiliser history would receive $200/ha. So as to attain a tenant the lease has been decreased to $150/arable hectare.

There would be the need for infrastructure costs for spray water and fertiliser storage. A tank, piping and pump would cost in the order of $30,000 and fertiliser storage $100,000. This has also been depreciated over 5 years for the viability study.

Crop Lease Option	annual per hectare costs/income
Lease Income	150
Costs	
Operational, rates, firebreaks, insurance	75
Infrastructure costs	45
Gypsum Costs	3.50
Liming program	20
Total costs	143.5
Profit/Loss	**6.5**

The small profit in this scenario is $6.50/arable hectare. This profit is marginal and would be erased if there is any cost blow out. Other ratios show that this investment is not a long term viable business. This profit is a ROI of 0.1% which is not acceptable as an investment therefore this is not a viable option.

Contract v Operational

The first comparison is to ascertain whether to run a cropping operational farm as a contract model or a total operational model. To run a cropping property in their own right Bush Heritage would have to invest significant funds into the business.

Total costs required to start a cropping business in Bush Heritage's name

Cropping requirements	minimum cost ($)	annual per ha cost depreciated over 5 year period	Annual Contract cost/ ha
Seeding Equipment	$500,000	$166	$50
Spreading equipment	$250000	$41	$27
Spraying equipment	$120000	$16	$36
Harvest equipment	$400,000	$133	$60

For an entity like Bush Heritage that has to start from scratch this table ascertains it is more cost effective to run as a contractual model. For this purpose we will assume that contractors can be obtained in a timely fashion.

Cropping Option

The operational cropping option viability is assessed under the following assumptions:

- Wheat/Canola rotation which is the most profitable in this region (although it has its limitations)
- An average fertiliser program of 10P, 75N, 10K. The soil tests are showing there is a deficiency in K over 43% of the property, S over 57% of the property and N over the majority of the property.
- The average Ag chemical package for the district is $158/ha which has been used for this study
- Infrastructure costs as per the crop lease option with the need for spray and fertiliser holding capacity
- Contract rates as per table (Contract v Operational)
- CBH costs at an average of 2T/ha yield with costs at $40/T.
- Amelioration program which would include a 5 year program of deep ripping due to the hard pan issues of the farm
- Lime and gypsum programs as per the lease option

Cropping Option	annual per hectare costs/income
Canola Income (1.65T/ha@800)	1320
Total Income(.5Canola+.5Wheat)	1141
Costs	
Contract spreading * 2	24
Amelioration program	50
Contract spraying * 3	36
Contract Seeding	50
Contract Harvest	60
CBH costs	80
Seed	59
Fertiliser	313
Ag Chem	158
Infrastructure costs	45
Gypsum program	3.5
Operational, rates, firebreaks, insurance	75
Liming program	20
Total costs	973.5
Profit/Loss	**-11.5**

As this viability analysis shows there is a budget deficit of $11.50 per hectare therefore this option is not viable.

Concluding Analysis

As a Farm consultant with 8 years of experience that has specialised in Strategic management and before that 7 years experience as an Agribusiness Bank manager, I am putting to you my analysis as to the viability of the Ediegarrup property as a stand alone business for the Bush Heritage Australia Group.

After analysing the figures for the options of running Ediegarrup as a grazing or cropping farm I have come to the following conclusion. The following options would run at an annual loss for at least the first 5 years of operations:

- Current leasing arrangement
- Improved property leasing option
- Operational grazing option
- and operational cropping option

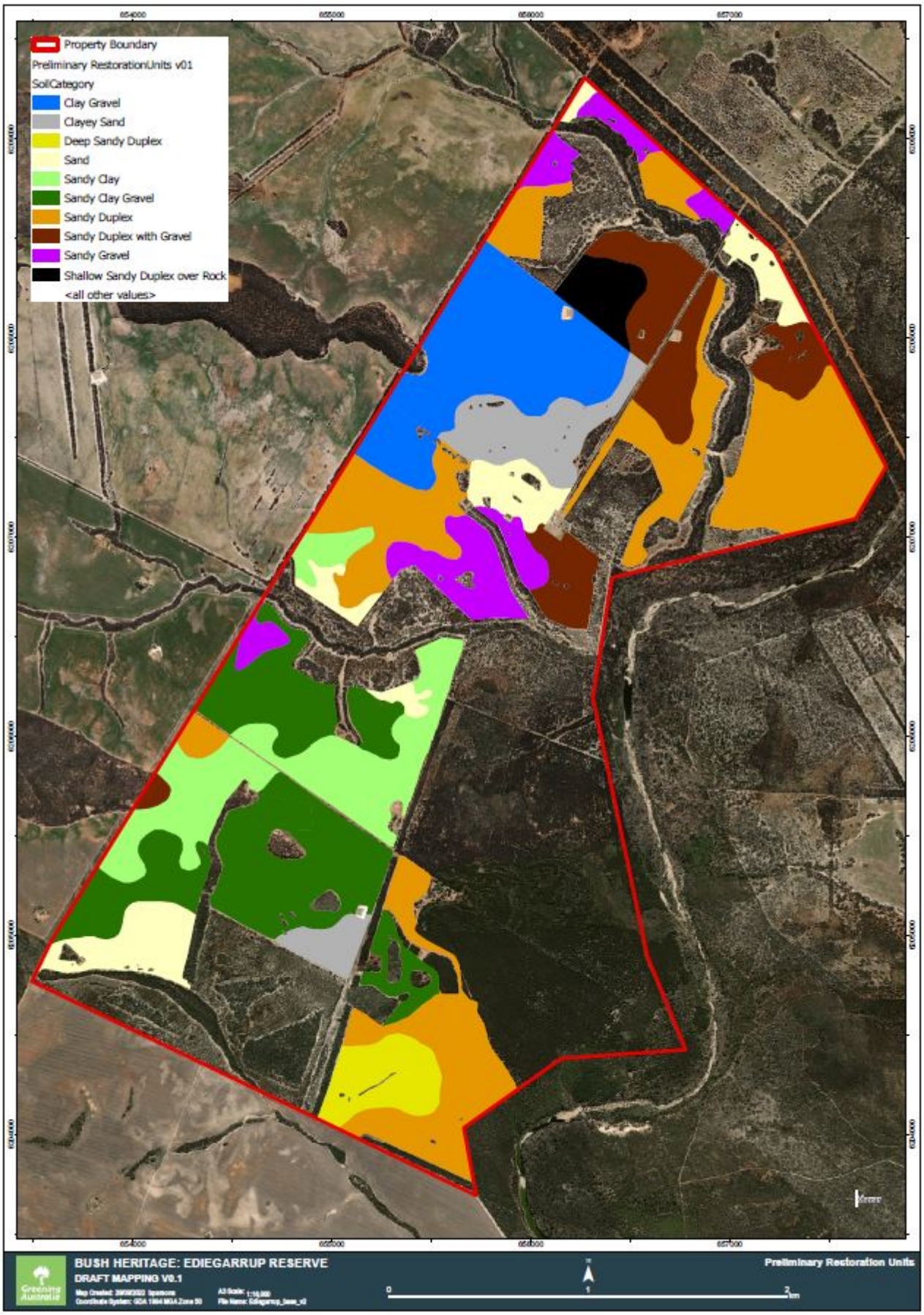
The one option that does not show a budget deficit is the crop leasing option. This is showing it will virtually break even on an annual basis, but at a return on investment of 0.01% this is also not a long term viable business proposition.

After assessing these viability calculations it would be my advice to explore other options for this property other than the normal agricultural activities for this region of cropping and/or grazing, with neither of these options being a long term viable option. The reason this farm is different to other profitable and viable farms in the district is the lack of fertiliser history. Ediegarrup has been leased out for the last 5 years and before that was a grazing property with a small proportion crop leased. It has had very little fertiliser history and to the current and previous owners knowledge has minimal liming and gypsum applied. It is showing significant deficiencies in Sulphur, Nitrogen, Potassium and Phosphorus which would be cost prohibitive to get up to levels needed for full production.

The soil structure and extensive grazing history would mean an expensive soil amelioration program would have to be engaged to get production to the levels of neighbouring properties. There is 35 ha of shallow conglomerate rock that will have to be reefinated which will cost $700/ha for a total of $24,500. There is 25ha of deep sand that would need to have clay applied to it at a cost of $950/ha for a total of $23,750. A significant portion of the property has soils that are sandy duplex or sandy clay. As the property has been heavily grazed in the past these soils have developed a hard pan that will require deep ripping at a cost of $170/ha. The area that requires deep ripping is 350 hectares which would have a total cost of $59,500. This is a cost that would be prohibitive to developing this property to the point that it is at full crop or grazing production.

Appendix A

Ediegarrup Maps


Property Boundary
Preliminary RestorationUnits v01
SoilCategory
Clay Gravel
Clayey Sand
Deep Sandy Duplex
Sand
Sandy Clay
Sandy Clay Gravel
Sandy Duplex
Sandy Duplex with Gravel
Sandy Gravel
Shallow Sandy Duplex over Rock
<all other values>
BUSH HERITAGE: EDIEGARRUP RESERVE
DRAFT MAPPING V0.1
Preliminary Restoration Units
0
1
2
km

Appendix B

Ediegarrup Soil Tests

Analysis Results

CSBP Soil and Plant Laboratory

98099
Bush Heritage Australia

		Lab No	9AS22007	9AS22008	9AS22009	9AS22010	9AS22011	9AS22012	9AS22013	9AS22014
		Name	TP001	TP002	TP003	TP004	TP005	TP006	TP007	TP008
		Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
		Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour			GRBR	GR	LTGR	BR	GRBR	LTGR	BR	LTBR
Gravel	%		55-60	0	15-20	0	5-10	0	0	0
Texture			1.5	1.5	1.5	2.5	2.0	1.0	2.5	2.0
Ammonium Nitrogen	mg/kg		4	1	2	6	4	2	2	6
Nitrate Nitrogen	mg/kg		< 1	< 1	< 1	4	1	< 1	< 1	< 1
Phosphorus Colwell	mg/kg		11	7	9	14	22	5	7	22
Potassium Colwell	mg/kg		24	< 15	34	360	118	< 15	249	94
Sulfur	mg/kg		2.2	2.2	2.0	10.0	4.6	1.2	16.5	8.3
Organic Carbon	%		1.10	0.91	0.67	1.96	1.56	0.66	1.03	2.23
Conductivity	dS/m		0.018	0.012	0.023	0.159	0.043	0.010	0.237	0.069
pH Level (CaCl2)			4.6	4.9	5.1	6.4	5.2	4.5	6.6	4.6
pH Level (H2O)			6.0	6.4	6.5	7.6	6.7	5.7	8.3	6.0

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22015	9AS22016	9AS22017	9AS22018	9AS22019	9AS22020	9AS22021	9AS22022
	Name	TP009	TP010	TP011	TP012	TP013	TP014	TP015	TP016
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		BR	BR	GR	BR	GR	GRBR	BRGR	GR
Gravel	%	5-10	25-30	0	0	0	0	0	0
Texture		2.0	2.0	1.0	2.5	1.0	2.0	1.5	1.5
Ammonium Nitrogen	mg/kg	4	3	2	4	2	2	2	3
Nitrate Nitrogen	mg/kg	1	1	< 1	< 1	< 1	1	< 1	1
Phosphorus Colwell	mg/kg	33	15	9	10	6	23	16	11
Potassium Colwell	mg/kg	118	259	46	249	< 15	269	43	16
Sulfur	mg/kg	83.8	11.8	1.3	15.4	1.5	36.7	4.0	1.5
Organic Carbon	%	2.29	2.30	1.19	2.33	1.05	1.18	1.44	0.89
Conductivity	dS/m	0.158	0.065	0.028	0.168	0.013	0.442	0.029	0.015
pH Level (CaCl2)		4.4	5.0	4.7	5.8	4.4	7.7	4.4	4.9
pH Level (H2O)		5.2	6.3	6.4	7.1	5.8	8.6	6.0	6.3

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22023	9AS22024	9AS22025	9AS22026	9AS22027	9AS22028	9AS22029	9AS22030
	Name	TP017	TP018	TP019	TP020	TP021	TP022	TP023	TP024
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		DKGR	BRGR	BRGR	DKGR	GR	BR	DKGR	BRGR
Gravel	%	0	5-10	5	0	0	0	0	0
Texture		1.5	1.5	1.5	1.0	1.5	2.5	2.0	1.5
Ammonium Nitrogen	mg/kg	3	3	2	4	4	3	6	2
Nitrate Nitrogen	mg/kg	1	< 1	< 1	2	4	6	2	1
Phosphorus Colwell	mg/kg	7	19	13	17	22	34	56	29
Potassium Colwell	mg/kg	27	32	17	54	102	482	478	106
Sulfur	mg/kg	1.8	2.3	2.0	1.9	2.5	8.9	33.4	2.4
Organic Carbon	%	1.22	1.65	1.01	1.53	1.54	2.07	2.76	1.58
Conductivity	dS/m	0.019	0.017	0.016	0.037	0.044	0.072	0.185	0.070
pH Level (CaCl2)		4.8	4.3	4.2	5.1	5.3	5.6	5.0	5.1
pH Level (H2O)		6.1	5.5	5.4	6.1	6.5	6.5	6.4	6.4

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22031	9AS22032	9AS22033	9AS22034	9AS22035	9AS22037	9AS22038	9AS22039
	Name	TP025	TP026	TP027	TP028	TP029	TP030	TP031	TP032
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		LTBR	LTGR	BR	GR	BR	BR	GR	GR
Gravel	%	0	0	0	0	0	0	0	0
Texture		1.5	1.5	2.0	1.5	2.5	2.5	1.5	1.5
Ammonium Nitrogen	mg/kg	3	2	6	2	1	3	77	3
Nitrate Nitrogen	mg/kg	< 1	< 1	2	< 1	< 1	< 1	8	1
Phosphorus Colwell	mg/kg	18	8	28	35	58	28	11	7
Potassium Colwell	mg/kg	58	< 15	191	50	259	348	235	40
Sulfur	mg/kg	2.4	1.2	5.3	1.6	29.6	40.6	17.7	1.5
Organic Carbon	%	1.79	0.46	1.91	0.92	1.79	1.17	1.30	0.81
Conductivity	dS/m	0.042	0.015	0.063	0.039	0.259	0.348	0.129	0.017
pH Level (CaCl2)		4.6	5.8	5.3	4.8	5.6	6.1	6.1	5.1
pH Level (H2O)		6.1	6.6	6.5	6.1	7.0	7.3	7.5	6.5

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22040	9AS22041	9AS22042	9AS22043	9AS22044	9AS22045	9AS22046	9AS22047
	Name	TP033	TP034	TP035	TP036	TP037	TP038	TP039	TP040
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		GR	DKGR	YWBR	BR	BR	BRGR	GRWH	BR
Gravel	%	5	0	0	0	5	0	0	0
Texture		1.5	2.0	1.5	2.0	2.0	1.5	1.0	2.0
Ammonium Nitrogen	mg/kg	5	4	4	3	35	3	< 1	5
Nitrate Nitrogen	mg/kg	< 1	3	1	< 1	59	< 1	< 1	< 1
Phosphorus Colwell	mg/kg	16	28	11	18	31	9	6	17
Potassium Colwell	mg/kg	164	451	24	295	269	47	< 15	80
Sulfur	mg/kg	13.7	25.2	1.9	6.0	58.9	2.4	1.2	12.8
Organic Carbon	%	1.81	1.64	1.25	1.48	2.79	1.48	0.40	2.06
Conductivity	dS/m	0.097	0.269	0.018	0.071	0.475	0.051	< 0.010	0.069
pH Level (CaCl2)		5.0	7.4	4.4	6.2	4.3	4.7	4.6	4.3
pH Level (H2O)		6.3	8.2	5.4	7.6	5.0	6.4	6.0	5.3

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22048	9AS22049	9AS22050	9AS22051	9AS22052	9AS22053	9AS22054	9AS22055
	Name	TP041	TP042	TP043	TP044	TP045	TP046	TP047	TP048
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		LTGR	BR	LTGR	DKBR	GRBR	BRGR	DKGR	DKGR
Gravel	%	15-20	0	0	0	0	0	0	0
Texture		1.5	2.5	1.5	2.5	2.0	2.0	3.0	1.5
Ammonium Nitrogen	mg/kg	< 1	5	3	5	4	3	5	5
Nitrate Nitrogen	mg/kg	< 1	< 1	< 1	1	2	1	3	< 1
Phosphorus Colwell	mg/kg	6	9	6	70	8	38	47	10
Potassium Colwell	mg/kg	17	570	36	353	194	123	542	15
Sulfur	mg/kg	3.8	14.3	1.9	11.3	15.3	2.8	48.0	1.6
Organic Carbon	%	0.78	2.82	0.82	2.08	2.40	1.76	1.70	1.37
Conductivity	dS/m	0.032	0.146	0.016	0.126	0.108	0.039	0.495	0.018
pH Level (CaCl2)		4.3	4.8	4.7	5.5	5.5	5.1	5.8	4.3
pH Level (H2O)		5.3	6.2	5.7	7.0	6.6	6.5	6.9	5.7

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22056	9AS22057	9AS22058	9AS22059	9AS22060	9AS22061	9AS22062	9AS22063
	Name	TP049	TP050	TP051	TP052	TP053	TP054	TP055	TP056
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		DKGR	BR	GRBR	BR	GR	GR	YWGR	YWGR
Gravel	%	0	5	15-20	0	0	0	0	0
Texture		1.5	2.0	1.5	2.0	1.5	1.5	1.5	1.5
Ammonium Nitrogen	mg/kg	2	6	5	4	3	19	< 1	2
Nitrate Nitrogen	mg/kg	< 1	2	3	2	< 1	4	< 1	< 1
Phosphorus Colwell	mg/kg	16	45	22	39	10	8	8	7
Potassium Colwell	mg/kg	< 15	178	51	329	65	79	< 15	< 15
Sulfur	mg/kg	1.6	12.0	2.5	40.8	1.2	7.0	3.4	1.3
Organic Carbon	%	1.03	2.23	2.70	3.03	0.60	1.50	0.72	0.59
Conductivity	dS/m	0.019	0.049	0.022	0.104	0.029	0.063	0.020	0.015
pH Level (CaCl2)		5.7	5.0	4.5	4.4	5.5	5.0	4.9	5.2
pH Level (H2O)		6.6	6.2	5.8	5.3	6.4	6.5	5.9	6.3

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

		Lab No	9AS22064	9AS22065	9AS22066	9AS22068	9AS22069	9AS22070	9AS22071	9AS22072
		Name	TP057	TP058	TP059	TP060	TP061	TP062	TP063	TP064
		Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
		Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour			BR	DKGR	GRBR	GRBR	GR	DKGR	DKGR	BR
Gravel	%		0	0	35-40	0	0	0	0	0
Texture			1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.0
Ammonium Nitrogen	mg/kg		5	4	4	3	5	4	4	5
Nitrate Nitrogen	mg/kg		2	< 1	< 1	1	1	1	2	4
Phosphorus Colwell	mg/kg		18	7	15	28	18	14	9	32
Potassium Colwell	mg/kg		96	25	52	23	145	26	33	93
Sulfur	mg/kg		1.8	1.2	10.1	1.6	2.2	1.8	1.5	3.1
Organic Carbon	%		1.37	1.39	1.78	1.14	1.67	1.01	1.55	2.33
Conductivity	dS/m		0.033	0.012	0.052	0.017	0.046	0.034	0.029	0.038
pH Level (CaCl2)			5.0	4.6	4.5	5.1	5.1	5.0	4.8	5.2
pH Level (H2O)			6.2	5.9	5.8	5.9	6.7	6.0	6.2	6.1

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22073	9AS22074	9AS22075	9AS22076	9AS22077	9AS22078	9AS22079	9AS22080
	Name	TP065	TP066	TP067	TP068	TP069	TP070	TP071	TP072
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		LTGR	DKGR	BR	BRGR	GR	DKGR	DKGR	DKGR
Gravel	%	0	0	0	0	0	0	0	0
Texture		1.5	1.5	2.5	2.5	2.5	2.5	2.5	2.5
Ammonium Nitrogen	mg/kg	3	3	7	6	4	3	6	5
Nitrate Nitrogen	mg/kg	< 1	< 1	10	2	< 1	7	3	2
Phosphorus Colwell	mg/kg	5	14	60	43	45	83	36	53
Potassium Colwell	mg/kg	< 15	16	391	378	631	427	197	412
Sulfur	mg/kg	1.0	1.8	39.0	55.1	24.7	65.6	7.2	18.3
Organic Carbon	%	0.97	1.43	3.14	2.73	1.87	1.66	1.88	2.18
Conductivity	dS/m	0.011	0.019	0.195	0.188	0.180	0.192	0.064	0.155
pH Level (CaCl2)		4.4	4.7	4.3	4.8	5.9	6.1	5.1	5.9
pH Level (H2O)		5.7	5.8	5.5	6.0	7.4	7.3	6.5	7.2

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22081	9AS22082	9AS22083	9AS22084	9AS22085	9AS22086	9AS22087	9AS22088
	Name	TP073	TP074	TP075	TP076	TP077	TP078	TP079	TP081
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		GRBR	DKGR	GR	GRBR	BRGR	YWBR	GR	BR
Gravel	%	0	0	0	0	0	0	0	0
Texture		2.5	1.5	1.5	2.5	1.5	1.5	1.5	2.0
Ammonium Nitrogen	mg/kg	7	2	4	2	4	3	2	3
Nitrate Nitrogen	mg/kg	4	< 1	1	2	1	< 1	< 1	< 1
Phosphorus Colwell	mg/kg	31	12	9	27	8	12	8	42
Potassium Colwell	mg/kg	270	19	26	290	38	37	26	141
Sulfur	mg/kg	13.1	1.4	2.4	5.3	1.8	1.4	1.2	8.5
Organic Carbon	%	2.82	1.39	0.93	1.47	2.44	1.04	0.62	2.10
Conductivity	dS/m	0.078	0.019	0.022	0.116	0.020	0.019	0.016	0.135
pH Level (CaCl2)		5.5	4.9	4.5	6.2	4.3	4.9	4.6	5.6
pH Level (H2O)		6.5	6.2	6.1	7.9	5.6	6.0	5.8	6.4

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

		Lab No	9AS22089	9AS22090	9AS22091	9AS22092	9AS22093	9AS22094	9AS22095	9AS22096
		Name	TP082	TP083	TP084	TP085	TP086	TP087	TP089	TP090
		Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
		Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour			BR	BRBK	GR	DKGR	DKGR	DKGR	BR	YWGR
Gravel	%		0	0	0	0	0	0	0	0
Texture			2.5	2.5	1.5	2.5	2.0	2.0	2.5	1.5
Ammonium Nitrogen	mg/kg		3	5	5	2	4	6	5	2
Nitrate Nitrogen	mg/kg		< 1	4	1	4	< 1	3	< 1	< 1
Phosphorus Colwell	mg/kg		51	65	8	21	55	30	57	33
Potassium Colwell	mg/kg		294	276	24	389	150	90	246	< 15
Sulfur	mg/kg		28.2	49.3	1.2	7.4	4.5	2.9	49.5	0.7
Organic Carbon	%		1.95	2.22	1.04	1.13	1.59	1.60	2.30	0.37
Conductivity	dS/m		0.183	0.100	0.026	0.181	0.094	0.076	0.203	0.011
pH Level (CaCl2)			6.0	5.6	5.4	6.8	5.4	5.9	5.1	4.4
pH Level (H2O)			7.2	6.4	6.8	8.1	6.9	6.9	6.4	5.3

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22103	9AS22104	9AS22105	9AS22106	9AS22107	9AS22108	9AS22109	9AS22110
	Name	TP091	TP092	TP093	TP094	TP095	TP096	TP097	TP098
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		GR	DKGR	BRGR	GR	YWGR	BR	DKGR	BR
Gravel	%	0	0	0	0	0	0	0	5
Texture		1.5	2.0	1.5	1.5	1.5	2.0	2.0	2.0
Ammonium Nitrogen	mg/kg	3	4	6	2	2	7	5	4
Nitrate Nitrogen	mg/kg	< 1	< 1	< 1	< 1	< 1	2	< 1	< 1
Phosphorus Colwell	mg/kg	15	39	34	9	9	22	24	12
Potassium Colwell	mg/kg	80	167	45	< 15	26	126	200	53
Sulfur	mg/kg	1.6	4.8	2.1	1.3	1.2	7.0	6.8	3.7
Organic Carbon	%	1.20	1.81	2.24	0.58	0.40	2.71	1.32	1.63
Conductivity	dS/m	0.033	0.100	0.033	0.021	0.011	0.047	0.155	0.047
pH Level (CaCl2)		4.6	4.8	4.2	4.5	4.5	4.5	6.2	4.6
pH Level (H2O)		6.3	6.2	5.3	6.0	5.6	5.9	7.5	6.0

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22111	9AS22112	9AS22113	9AS22114	9AS22115	9AS22116	9AS22117	9AS22118
	Name	TP099	TP100	TP101	TP102	TP103	TP104	TP105	TP106
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		BR	BRGR	BR	GRBR	BR	BRGR	LTBR	DKBR
Gravel	%	5-10	5-10	5-10	0	5-10	0	15-20	0
Texture		2.0	1.5	2.0	2.0	2.0	2.5	2.0	2.5
Ammonium Nitrogen	mg/kg	4	4	4	6	5	4	5	6
Nitrate Nitrogen	mg/kg	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Phosphorus Colwell	mg/kg	59	17	14	24	25	21	18	28
Potassium Colwell	mg/kg	155	19	48	146	49	318	97	136
Sulfur	mg/kg	17.5	1.7	7.2	4.0	18.0	20.2	7.9	21.4
Organic Carbon	%	1.90	0.96	1.62	1.89	2.16	1.85	2.25	3.57
Conductivity	dS/m	0.133	0.014	0.069	0.080	0.104	0.131	0.041	0.108
pH Level (CaCl2)		4.7	4.5	4.5	5.3	4.4	6.1	4.3	4.6
pH Level (H2O)		6.0	5.5	5.7	6.7	5.5	7.3	5.2	5.9

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22119	9AS22120	9AS22121	9AS22122	9AS22123	9AS22124	9AS22125	9AS22126
	Name	TP107	TP108	TP109	TP110	TP111	TP112	TP113	TP114
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		GRBR	DKBR	BR	DKGR	LTGR	GR	BRGR	GRBR
Gravel	%	5	0	5-10	0	0	0	0	15-20
Texture		2.5	2.5	1.5	2.5	1.5	1.5	2.0	2.0
Ammonium Nitrogen	mg/kg	4	3	5	7	2	3	4	6
Nitrate Nitrogen	mg/kg	< 1	< 1	< 1	5	< 1	< 1	< 1	< 1
Phosphorus Colwell	mg/kg	14	36	15	14	14	6	16	14
Potassium Colwell	mg/kg	60	323	25	393	19	< 15	68	71
Sulfur	mg/kg	7.7	30.1	8.0	11.0	1.1	1.7	4.1	26.2
Organic Carbon	%	1.93	1.49	1.00	2.05	0.54	1.17	1.78	2.16
Conductivity	dS/m	0.036	0.198	0.029	0.115	0.012	0.011	0.046	0.078
pH Level (CaCl2)		4.3	6.4	4.4	6.5	4.4	4.3	4.4	4.7
pH Level (H2O)		5.2	7.6	5.4	7.7	5.5	5.2	5.8	6.0

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

		Lab No	9AS22127	9AS22128	9AS22129	9AS22130	9AS22131	9AS22133	9AS22134	9AS22135
		Name	TP115	TP116	TP117	TP118	TP119	TP120	TP121	TP122
		Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
		Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour			BRGR	DKGR	GRBR	BRGR	YWGR	GR	DKGR	GR
Gravel	%		0	5-10	0	5-10	5	5	15-20	5
Texture			2.5	2.0	2.5	2.5	1.5	1.5	1.5	1.5
Ammonium Nitrogen	mg/kg		4	3	6	3	2	4	4	2
Nitrate Nitrogen	mg/kg		3	1	6	2	1	1	2	< 1
Phosphorus Colwell	mg/kg		12	20	9	11	6	6	20	6
Potassium Colwell	mg/kg		313	140	339	87	45	29	39	28
Sulfur	mg/kg		6.8	2.2	3.6	1.9	2.0	2.0	2.5	1.8
Organic Carbon	%		2.15	1.59	1.87	1.74	0.97	1.41	2.44	1.44
Conductivity	dS/m		0.108	0.036	0.089	0.042	0.025	0.023	0.025	0.017
pH Level (CaCl2)			6.2	5.0	6.5	5.5	5.1	5.4	4.8	4.8
pH Level (H2O)			7.6	6.2	7.3	6.9	6.6	6.8	6.1	6.2

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22136	9AS22137	9AS22138	9AS22139	9AS22140	9AS22141	9AS22142	9AS22143
	Name	TP123	TP124	TP125	TP126	TP127	TP128	TP129	TP130
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		DKGR	GR	GR	BR	GRBK	YWGR	GR	GRBR
Gravel	%	0	0	0	0	15-20	0	5-10	5-10
Texture		1.5	1.5	1.5	2.0	2.0	2.5	2.5	2.0
Ammonium Nitrogen	mg/kg	2	< 1	1	3	5	3	3	4
Nitrate Nitrogen	mg/kg	< 1	< 1	< 1	< 1	2	2	2	2
Phosphorus Colwell	mg/kg	7	8	8	10	18	22	16	21
Potassium Colwell	mg/kg	< 15	< 15	29	55	327	382	236	217
Sulfur	mg/kg	1.4	1.2	1.6	4.5	2.8	9.5	2.3	2.7
Organic Carbon	%	1.15	0.98	0.98	1.68	3.25	1.31	1.74	3.06
Conductivity	dS/m	0.016	0.014	0.029	0.033	0.057	0.161	0.058	0.039
pH Level (CaCl2)		4.6	4.5	5.7	4.4	5.2	6.5	5.6	4.9
pH Level (H2O)		6.0	5.9	6.6	5.9	6.6	8.3	6.9	6.2

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22144	9AS22145	9AS22146	9AS22147	9AS22148	9AS22149	9AS22150	9AS22151
	Name	TP131	TP132	TP133	TP134	TP135	TP136	TP137	TP138
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		LTGR	DKGR	BR	BRGR	BR	LTBR	YWBR	BR
Gravel	%	0	0	0	5-10	0	0	0	5-10
Texture		1.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Ammonium Nitrogen	mg/kg	1	3	2	2	4	6	< 1	53
Nitrate Nitrogen	mg/kg	< 1	< 1	< 1	1	< 1	1	< 1	6
Phosphorus Colwell	mg/kg	9	15	14	17	23	11	6	12
Potassium Colwell	mg/kg	< 15	203	204	250	372	152	337	445
Sulfur	mg/kg	1.7	11.5	25.1	12.3	86.2	8.6	13.0	847.1
Organic Carbon	%	1.04	1.68	1.73	2.18	2.01	2.92	0.95	1.82
Conductivity	dS/m	0.016	0.139	0.289	0.168	0.325	0.086	0.174	3.327
pH Level (CaCl2)		4.6	6.1	6.3	6.3	5.6	5.4	6.8	4.7
pH Level (H2O)		5.9	7.7	7.4	7.9	6.9	6.9	8.3	5.1

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22152	9AS22153	9AS22154	9AS22155	9AS22156	9AS22157	9AS22158	9AS22159
	Name	TP139	TP140	TP141	TP142	TP143	TP144	TP145	TP146
	Code	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10	0-10	0-10	0-10
Colour		GR	GR	GR	BRGR	LTGR	DKGR	DKGR	BRGR
Gravel	%	0	0	5-10	0	35-40	5-10	0	0
Texture		1.5	1.5	2.0	2.5	2.0	1.5	1.5	1.5
Ammonium Nitrogen	mg/kg	3	5	9	5	2	3	10	5
Nitrate Nitrogen	mg/kg	< 1	1	2	< 1	12	< 1	5	< 1
Phosphorus Colwell	mg/kg	9	11	10	58	24	25	23	12
Potassium Colwell	mg/kg	29	15	23	190	69	24	25	43
Sulfur	mg/kg	1.8	2.0	2.0	11.6	2.8	1.9	4.5	1.6
Organic Carbon	%	0.69	1.59	1.43	1.62	1.10	1.39	2.43	1.17
Conductivity	dS/m	0.025	0.016	0.031	0.201	0.042	0.032	0.050	0.036
pH Level (CaCl2)		5.0	4.9	5.1	5.5	5.3	4.9	5.6	5.3
pH Level (H2O)		6.3	5.7	6.4	6.9	6.3	6.2	6.4	6.2

CSBP Lab. Extract Value.

Analysis Results

CSBP Soil and Plant Laboratory

	Lab No	9AS22160	9AS22161	9AS22162	9AS22164	9AS22165
	Name	TP147	TP148	TP149	TP080 - 31/8/22	TP080 - 1/9/22
	Code	Soil	Soil	Soil	Soil	Soil
	Customer	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup	BHA_Ediegarrup
	Depth	0-10	0-10	0-10	0-10	0-10
Colour		GRBR	GR	BR	BR	GRBR
Gravel	%	5-10	0	0	0	0
Texture		2.0	1.5	3.0	2.5	2.5
Ammonium Nitrogen	mg/kg	242	3	3	3	4
Nitrate Nitrogen	mg/kg	51	< 1	1	2	1
Phosphorus Colwell	mg/kg	50	7	25	29	60
Potassium Colwell	mg/kg	832	21	326	125	214
Sulfur	mg/kg	15.3	2.3	10.2	17.0	7.1
Organic Carbon	%	1.68	1.55	0.92	1.49	2.23
Conductivity	dS/m	0.224	0.021	0.300	0.192	0.087
pH Level (CaCl2)		5.9	4.4	6.9	5.3	5.9
pH Level (H2O)		7.1	5.6	8.3	6.6	7.3

CSBP Lab. Extract Value.

Appendix C

Photos supporting evidence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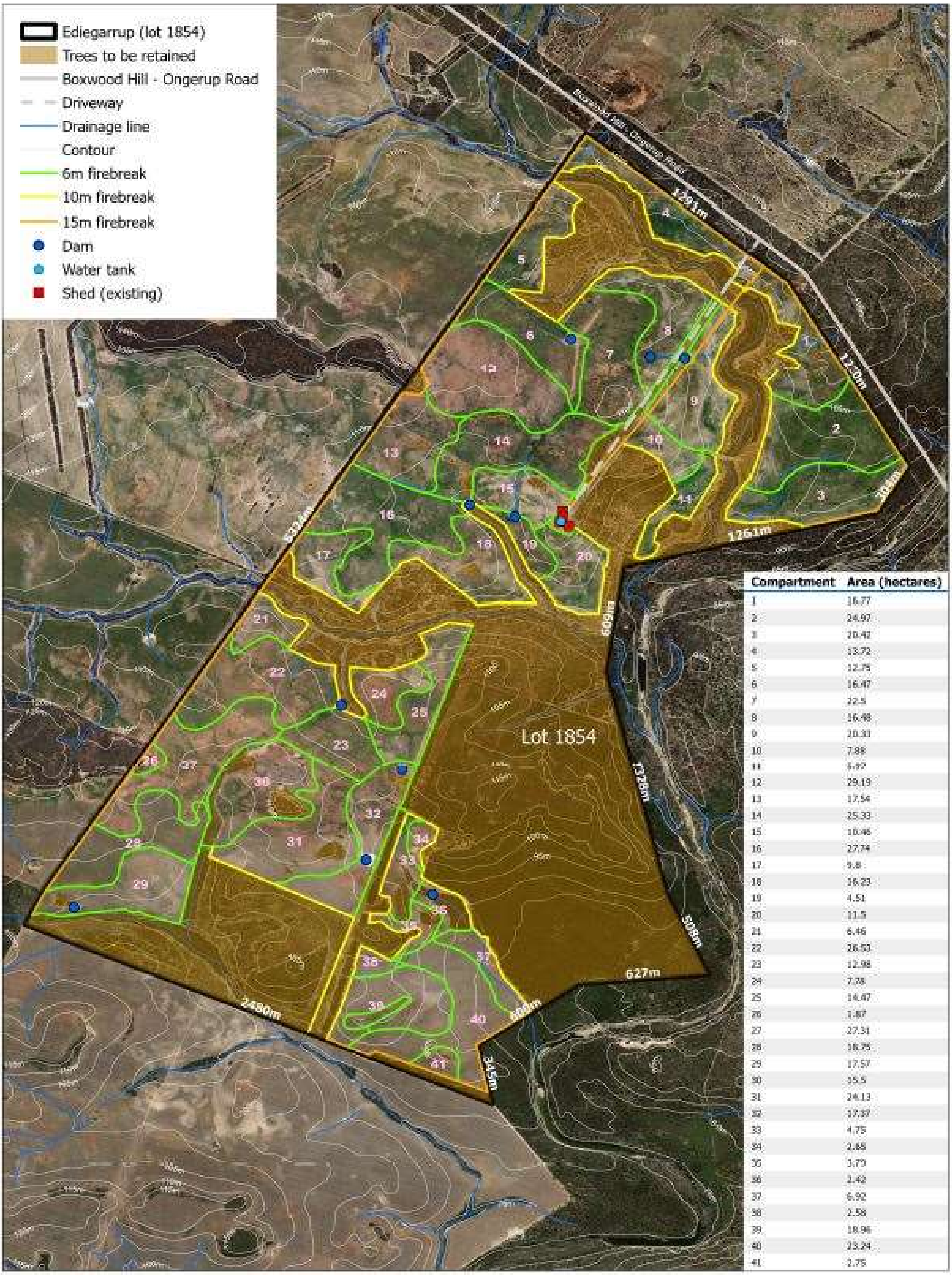
Ediegarrup Reserve Plantation Management Plan

This Plantation Management Plan (PLP) has been developed for the establishment and ongoing operation and Management of the Revegetation Plantation at Ediegarrup Reserve, located at 1287 Boxwood Hill-Ongerup Road, Boxwood Hill, WA 6337.

The PLP has been developed in accordance with guidelines contained in the Code of Practice for Timber Plantations In Western Australia, 2014.

Contents

Plantation Map



Compartment	Area (hectares)
1	16.77
2	24.97
3	20.42
4	13.72
5	12.75
6	16.47
7	22.5
8	16.48
9	20.33
10	7.88
11	6.97
12	29.19
13	17.54
14	25.33
15	10.46
16	27.74
17	9.8
18	16.23
19	4.51
20	11.5
21	6.46
22	26.53
23	12.98
24	7.78
25	14.47
26	1.87
27	27.31
28	18.75
29	17.57
30	15.5
31	24.13
32	17.37
33	4.75
34	2.65
35	3.73
36	2.42
37	6.92
38	2.58
39	18.96
40	23.24
41	2.75

Ediegarrup revegetation development application site plan

0 400 800 1,200 1,600

Metres

1:20,000 @ A3

N

Created by: Paul Young 04/04/2023
Imagery credit: Monar, Some data layers supplied by Bushfire Prone Planning

Establishment Plan

Areas of native vegetation and significant values

The areas of native vegetation are clearly outlined in the Plantation Map and are to be retained and managed to avoid any loss in either extent or composition.

Setback distances to watercourses, wetlands, reservoirs and significant values

All watercourses on the property have been retained to provide a buffer of at least 30m. None of the plantation area will be located within this buffer zone. All dams are to remain accessible for firefighting purposes (see Bushfire Management Plan).

Statutory setback distances to dwellings and gazetted infrastructure

The only buildings existing on the property are non-habitable sheds, located at the end of the Driveway. An Asset Protection Zone of 50m will be established and maintained around these buildings. This is also the location of the Water Tanks for firefighting purposes.

Control of declared animals, declared plants and other pest plants

All declared pest animals and plants will be management in line with Best Practice. Fox cat and rabbit control have been undertaken on the site since Bush Heritage acquired the property in March 2022. Weed control will be undertaken across cleared portions of the property prior to revegetation to remove all weed species, including declared pest species.

Areas to be planted, compartment sizes

The total are to be planted across the property is approximately 600ha and will be separated into blocks of <30ha to allow for effective access and management. The separation into block planting areas of <30ha will also assist in fire fighting operations.

Species to be planted

All species to be planted occur locally and are based on Vegetation Survey conducted on the property in Spring on 2022. The species to be planted are aligned with soil types matching the vegetation communities found in the bushland areas of the property and surrounding conservation reserves.

A list of Species found on Ediegarrup are provided in Appendix 1.

Direction of planting lines in relation to contours and natural drainage

Where possible, planting lines will be aligned with contours and natural drainage lines to minimise erosion across the site and impacts on local waterways.

Description of soil preparation methods

Following weed control, seed will be planted into the soil using a one pass direct drill system that will scalp soil 20cm either side of the drill line. On some of the plating sites, particularly on the Moort Forrest areas, the topsoil (10-50mm) will be removed by a grader to reduce weed burdon, then ploughed to break up soil profile and seed broadcast across the site.

Pest and weed control prescription

Where possible, weeds will be sprayed in the early spring of the year prior to planting to reduce weed seed set and limit additional soil seed stores. Weeds will be sprayed at least 2 weeks prior to planting and will incorporate a knockdown (e.g. Glyphosate) and residual (e.g. Symazine).

Planting prescription

Direct seeding of seed mixes relevant to soil types will be delivered via a one pass direct seeding machine at line spacings of 1.5m and at a rate of approximately 750g/ha. Following direct seeding, seedlings will

be planted into the rows to enhance the diversity and improve success rates, particularly for proteaceous species.

Follow-up planting will be conducted in areas where seedlings have failed to achieve full coverage for 2 years post planting.

Access and firebreaks

Access points and fire breaks will be delineated prior to planting of seed or seedlings to ensure correct alignment and sufficient widths are established. The fire breaks and access tracks will be in accordance with the Bushfire Management Plan and Plantation Map.

Fertilising prescription

No fertiliser will be applied as part of this plantation.

Sensitive neighbours

The only sensitive neighbours are related to Red Moort conservation reserve, owned and managed by Bush Heritage Australia. While some of the neighbouring properties may have crops established at the time of planting, care will be taken to avoid drift when applying chemicals to control weeds.

Security management

Security of the site will be managed through regular patrols and inspections of the property by BHA staff and through the installation of a gate at the front driveway.

Maintenance Plan

Native vegetation management

The areas of native vegetation are clearly outlined in the Plantation Map and are to be retained and managed to avoid any loss in either extent or composition. These areas will not be exposed to chemicals or fertilisers and will not be removed mechanically unless to comply with Fire Control requirements.

Pruning and thinning regimes

No pruning or thinning regimes will be delivered as part of the ongoing management of the plantation.

The Bushfire Management Plan outlines the requirements to regularly inspect and monitor vegetation and manage excessive fuel loads through appropriately planned and delivered prescribed burns.

Control of declared animals, declared plants and other pest plants

Regular (at least quarterly) patrols of the property will be conducted in order to manage declared pest animals and plants on the site. Ongoing management of foxes, cats and rabbits will be undertaken as well as management of declared weed species and other pest plant species.

Weed and pest control prescription

Follow-up spraying of the planted area will be conducted at least 3 times in the 18 months post planting to reduce weed burden and improve plantation success

Fertilising prescription

No fertiliser will be applied as part of this plantation.

Access and firebreak maintenance

Access points and fire breaks will be delineated prior to planting of seed or seedlings to ensure correct alignment and sufficient widths are established. The fire breaks and access tracks will be in accordance with the Bushfire Management Plan and Plantation Map.

Grazing strategy

No grazing is planned for the plantation area.

Bio-security issues

Bio-security issues will be managed in line with other Bush Heritage Properties. The most significant threat for native vegetation is the spread of *Phtophthera cinimmomi* or dieback. To manage this threat, all vehicles will need to be cleaned and inspected upon entry to site. Other biosecurity issues will be monitored regularly during onsite inspections.

Infrastructure maintenance

There is limited infrastructure present on the property, however all existing infrastructure will be monitored at least annually. Infrastructure to be inspected include:

- Fences and gates
- Sheds
- Firefighting Water Tanks
- Firefighting Equipment
- Dams
- Powerlines

Project Schedule

YEAR 1: 2023	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Development Application												
Site preparation & planting*												
Initial germination monitoring												
Weed/pest control (as req)												
Access and Fire Break Maintenance												
Infrastructure maintenance (as req)												
YEAR 2: 2024	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Survival monitoring (autumn/spring)												
Weed/pest control (as required)												
Infill planting (as required)												
Access and Fire Break Maintenance												
YEAR 3: 2025	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Survival monitoring												
Weed/pest control (as required)												
Infill planting (as required)												
Carbon monitoring												
Access and Fire Break Maintenance												
Infrastructure maintenance (as req)												
YEAR 4: 2026	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Survival monitoring												
Weed/pest control (as required)												
Infill planting (as required)												
Carbon monitoring												
Access and Fire Break Maintenance												
Infrastructure maintenance (as req)												
YEAR 5: 2027	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Survival monitoring												
Weed/pest control (as required)												
Infill planting (as required)												
Carbon monitoring												
Access and Fire Break Maintenance												
Infrastructure maintenance (as req)												
2028 and Beyond	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Weed/pest control (as required)												
Infill planting (as required)												
Carbon monitoring												
Access and Fire Break Maintenance												
Infrastructure maintenance (as req)												

** Site preparation and planting will not begin until project registration confirmation and Development Approval have been received.*

	Greening Australia
	Bush Heritage Australia - on-going

Appendix 1 – Species List

black = dominant, **dark grey = subdominant/emergent., or only recorded as dominant rarely.**

Broad veg type	Veg Description	Canopy	Understory
Moort	E. platypus Low Open Forest	**Eucalyptus platypus**	**Melaleuca acuminata**
			Melaleuca pauperiflora
			Melaleuca cucullata
			Melaleuca torquata
			Acacia glaucoptera
			Cyathostemon blacketii
			Melaleuca haplantha (rarely)
			Melaleuca undulata (rarely
			Daviesia argillacea (rarely)
			Disphyma crassifolium (rarely)
			Rhagodia preissii (rarely)
		Eucalyptus vesiculosa (rarely)	Melaleuca pentagona
Mallets	E. melanophitra &/or E. astringens Tall Woodland	**Eucalyptus melanophitra**	Melaleuca acuminata
		&/or	Daviesia argillacea
		E. astringens	Dodonaea viscosa
			Rhagodia preissii
			Hibbertia exasperata
			Phebalium tuberculatum
			Gastrolbobium discolor (complex)
			Philotheca gardneri (ssp not det yet)
			Lasiopetalum compactum
			Cyathostemon blacketii
			Indigofera australis ssp hesperia
			Melaleuca pentagona
			Lepidosperma sp Saltbush Hill
			Lepidosperma humile

Mallees	Eucalyptus flocktoniae/ Euc. ssp Open Mallee over Melaleuca spp (heavy soils)	**Eucalyptus flocktoniae**	**Melaleuca cucculata**
		Eucalyputs annulata	**Melauca pauperiflora**
		Eucalyputs vegrandis ssp vegrandis	**Melaleuca torquata**
		Eucalyptus conglobata ssp perata	***Melaleuca acuminata**
		Eucalyptus platypus (ecotonal)	**Melaleuca haplantha**
			Daviesia argillacea
			Acacia glaucoptera
			Daviesia aphylla (ex benathmmii)
			Acrotriche dura P4
			Cyathostemon ambiguus
			Boronia inornata
			Exocarpus capnodioides (ex aphylla)
			Melaeuca acuminata (rarely)
			Melaleuca bracteosa (ecotonal
			Melaleuca rigidifolia (ecotonal)
			Hakea commutata (rarely)
			Wilsonia humilis
			Gahnia aristata
			Gahnia ancistrophylla
Mallee	Eucalyptus flocktoniae.E vegrandis over Melaleuca undulata &/or Mel rgidifolia Shrubland	**Eucalyptus flocktoniae**	**Melaleuca undulata**
		Eucalyptus vegrandis ssp vegrandis	**Melaleuca rigidifolia**
		Eucalyputs annulata	Melaleuca hamata
			Melaleuca lateriflora
			Melaleuca bracteosa (rarley)
			Melaleuca haplantha
			Daviesia aphylla (ex benthamii)
			Daviesia argillacea
			Bornina inornata
			Comersperma spinosa

			Coopernookia polygalacea
			Exocarpus capnodioides (ex aphullus)
			Aotus sp Southern Wheatbelt
			Pultenaea rotundifolia
			Hibbertia psilocarpa
			Ozothamnus lepidophyllus
			Acrotriche dura P4
			Templetonia rossii
			Grevillea pectinata
			Hakea commutata
			Acacia bidentata (uncommon)
			Gahnia aristata
			Gahnia ancistrophylla
Mallee	E. uncinata/E.pleurocarpa Open Mallee over Banksia media tall Open Shrubland Melaluca spathulata Mixed Myrtaceae Shrubland/Open Heath	**Eucalyptus uncinata**	**Banksia media**
		Eucalyptus thamnoides	**Melaleuca spathulata**
		Eucalyptus phaenophylla	Melaleuca subfalcata
		Eucalyptus pleurocarpa	Melaleuca bracteosa
		Eucalyputus incrassata	**Melaleuca rigidifolia**
		Eucalyptus pluricaulis	Melalecua lateriflora (rarely)
			Melaeuca hamata (rarely)
			Calothamnus gibbosus
			Beaufortia micrantha
			Hibbertia gracilipes
			Daviesia lancifolia
			Isopogon sp Fitzgerald
			Banksia cirsioides
			Callitris roei (rarely)
			Hibbertia lineata (ex recurvifolia)

			Austrobaeckea tetrapora (ex Tetrapora verracosa)
			L eptomeria pachyphylla
			Banksia alliacae
			Melaleuca apodocephala
			Acacia bidentata
			Acacia chyrsocephala
			Acacia octonervia
			#Acacia declinata
			Boronia crassifolia
			Styphelia intertexa
			Adenanthos glabrescens ssp exasperatus
			Leptospermum aff sp Bandalup Hill
			Leptospermum oligandrum/erubescens complex
Mallee	Mixed Euc spp over Melaleuca spathulata/Mel spp Open Heath	Eucalyptus uncinata	**Melaleuca spathulata**
		Eucalyptus thamnoides	**Melaleuca lateralis**
		Eucalyptus phaenophylla	Melaleuca bracteosa
		Eucalyputus incrassata	**Melaleuca rigidifolia**
		Eucalyutus pluricaulis	Melalecua lateriflora (rarely)
		Eucalyptus flocktoniae	Melaleuca hamata (rarely)
		Eucalyptus vegrandisssp vegrandis	Hibbertia gracilipes
			Leucopogon opponens
			Cyathostemon ambiguus (uncommon)
			Comespermum spinosum
			Hibbertia gracilipes
			Leptomeria pachyphylla
Mallee	Euc spp over Melaleuca hamata Open Shrubland	**Eucalyptus vegrandis ssp vegrandis**	**Melaleuca hamata**
		Eucalyptus uncinata	Melaleuca depauperata
		Eucalyptus redunca (both var)	Melaleuca aracarioides
		Eucalyptus flocktoniana	Gastrolobium discolor

		Eucalyptus phaenophylla	Hakea laurina
		Eucalytpus thamnoides	Hibbertia exasperata
		Eucalyptus conglobata	Hakea lissocarpha
			Callitris roei
			Rhagodia preissii
			Boronia inornata
			Boronia scabra
			Hibbertia exasperata
			Coopernookia striopholata
			Coopernookia polygalaceae
			Rinzia communis
			Acacia patiagiata
			Acacia bidentata
			Orthrosanthus laxus
			Lomandra effusa
			Lomandra micranthpa
			Gahnia ancistrophylla
			Desmocladus lateriflrous
			Neurachne alopecuoidea
			Lepidosperma sp Bandalup Scabrid
Mallee	E. pleurocarpa Open Mallee over Banksia media (deep sand)	**E. pleurocarpa**	Nuytsia floribunda
		E. uncinata	**Banksia media**
			Beaufortia micanatha.
			Melaleuca subtrigona
			Conothamnus aureus
			Isopogon trilobus
			Lambertia inermis
			Hakea pandanicarpa ssp crassifolia
			Taxandria spathulata

			Banksia nutans
			Melaleuca carrii
			Hakea corymbosa
			Calothamnus gracilis
			Melaleuca thymoides
			Banksia alliacae
			Banksia brunnea
			Banksia obovatus
			Hakea corymbosa
			Gomphlobium tomentosa
			Acacia pycnocephala
			Hypolaenafastigiata
			Leucopogon sp Coujinup
			Kunzea preissiana
			Banksia sessilis (few plants)
			Banksia attenuata
			Hemiandra pungens
			Calytrix flavescens
			Hypocalymmna asperum
			Gompholobium scabrum
			Adenanthos cuneatus
			Petrophile ericifolia
			Calothamnus sanguineus
			Conospermum floribundum (1 plant)
			Allocasuarina humilis
			Chaeteospora curvifolia (exSchoenus curvifolius)
			Lyginia barbata
			Tricostularia newbeyi
			Mesomelaena stygia
			Hypolaena fastigiata

			Amphipogon turbinatus
Mallee	E. ecotosta &/or E pleurocarpa Open Mallee over Banksia cirsiodes Heath	**E. pleurocarpa**	**Banksia cirsioides**
		E. ecostata	**Beuafortia micrantha**
		E. phaenophylla (rare)	**Taxandria spathulata**
		E. redunca ssp porphoryea(rare)	**Banksia media**
		E. thamoides(rare)	**Callitris roei**
		E.uncinata (rare)	Melaleuca tuberculata
			Hibbertia exasperata
			Banksia alliacea
			Lasiopetalum compactum
			Dampiera lavandulacea
			Hibbertia gracilipes
			Hibbertia lineata(rarely)
			Hovea pungens
			Stachystemon virgatus
			Trymalium elachopyllum (rarely)
			Calothamnus sanguineus (rarely)
			Styphelia depressa (ex L. tamminensis)
			Leucopogon sp short style
			Templetonia retusa (rarely)
			Allocasuarina humilis (rarely)
			Boronia crassifolia
			Stylidium albomontis
			Lepidosperma sp Saltbush Hill
			Lepidosperma spp (unident so far)
			Gahnia ancistrophylla
			Amhipogon turbinatus
			Neurachne alopecuroidea
			Gahnia ancistrophylla (rarely)

Shrublands	Granite Mixed shrublands		**Hypocalymma angustifolium**
			Calothamnus quadrifidus
			Astus tetragona
			Kunzea affinis
			Leptospermum maxwellii
	includes Astus tetragona Low Open Shurblands		**Leptospermum oligandrum erubescens complex**
			Leucopogon denticulatus
			Philotheca gardneri
			Melaleuca hamata*
			Melaleuca carrii
			Eutaxia cuneata
			Mirbelia trichocalyx
			Melaleuca tuberculata
			Melaleuca araucariodies
			Hibbertia exasperata
			Prostanthera canaliculata
			Damperia lavandulacea
			Dodoanaea pinifolia
			Acacia mimica ssp angusta
			Acacia sulcata (ssp not det yet)
			Acacia lasiocalyx
			Styphelia lissanthoides
			Verticordia plumosa ssp brachyphylla
			Verticordi endlicheriana
			Verticordia brachypoda
			Lepidsoperma sp C
			Lepidosperma spp undetermined yet
			Lepidosperma sanguinolentum
			Neurachne alopecuroidea

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: 1287 Boxwood Hill-Ongerup Road, Boxwood Hill

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 22 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: #230065 (v1.0)

Bushfire management plan date: Day 15 Month March Year 2023

Client/business name: Canopy Nature-based Solutions, Greening Australia

	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 

Date 15 / 03 / 2023

BUSHFIRE PRONE PLANNING

Bush Heritage & Greening Australia Environmental Plantings Stored Carbon Project – Ediegarrup

Bushfire Management Plan (BMP)

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

1287 Boxwood Hill-Ongerup Road, Boxwood Hill

Shire of Jerramungup

Change in Land Use – Plantations

15 March 2023

Job Reference No: 230065

BPP GROUP PTY LTD T/A BUSHFIRE PRONE PLANNING

ACN: 39 166 551 784 | ABN: 39 166 551 784

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DOCUMENT CONTROL

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

VERSION HISTORY		
Version	Details	Date
1.0	Original	15 March 2023
-	-	

BMP (Master) Template v9.1

DISTRIBUTION					
Destination		Version	No. Copies	Hard Copy	Electronic Copy
Person	Email				
Liam Crook	lcrook@greening australia.org.au	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.

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LIST OF FIGURES

SUMMARY STATEMENTS

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

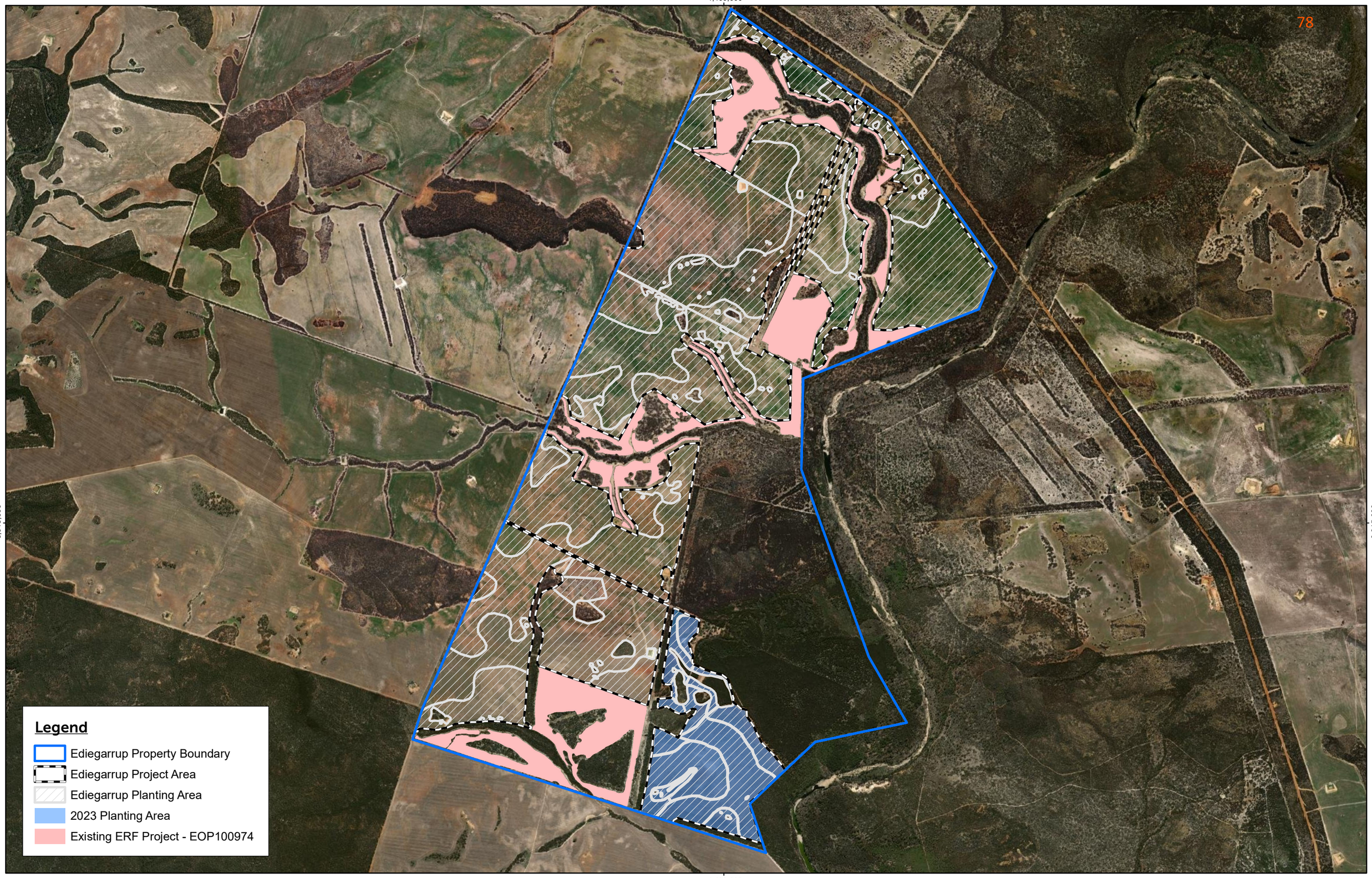
1 PROPOSAL DETAILS AND THE BUSHFIRE MANAGEMENT PLAN

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: P209447 1854 (1066.8849 hectares)
Plantation type(s):	Native Mixed Species
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. As the Plantation site is within the Shire of Jerramungup, the Plantation requires compliance elements from both the Shire of Jerramungup Fire Control Information (Firebreak Notice) and 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. The subject Plantation site is under the control of the landowner and as such the Plantation Manger/s in conjunction with the landowner is responsible for the ongoing management.	

-1,400,000

-3,945,000



-1,400,000

-3,945,000

EDIEGARRUP

Carbon Yields associated with proposed planting areas

Map Created: 17/02/2023 musher
Coordinate System: GDA 1994 Geoscience Australia Lambert
File Name: Ediegarrup_20230217_V03
A4 Scale: 1:22,622

N

0 0.5 1 Kilometers

Figure 1.3

Location Plan

Lot 1854 on Plan 209447, Area : 1066.8849 ha
1287 Boxwood Hill-Ongerup Road,
BOXWOOD HILL 6338
SHIRE OF JERRAMUNGUP

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

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

Reserves

- Reserves

Legislated Lands and Waters

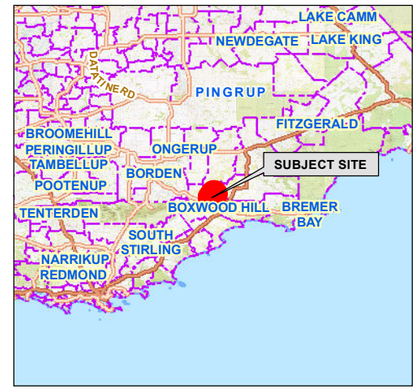
- Nature Reserve
- National Park

DBCA Lands of Interest

- Crown Freehold - Dept Interest

0 2 4 6 8 10
Kilometres

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



Aerial Imagery : Google Earth

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 15/03/2023
Map updated by: Ian 15/03/2023
A3 Scale 1:250,000

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2023\230065 - 1287 Boxwood Hill-Ongerup Road Boxwood Hill - Greening Australia (BMP)\Mapping\MXD\230065_Fig1-1_LOC_1287 Boxwood Hill.mxd

Figure 1.2

Bushfire Prone Area

Lot 1854 on Plan 209447, Area : 1066.8849 ha
1287 Boxwood Hill-Ongerup Road,
BOXWOOD HILL 6338
SHIRE OF JERRAMUNGUP

BOXWOOD HILL-ONGERUP RD
NORMANS RD
MONJEBUP RD
Monjebup Creek
Corackerup Creek
SUBJECT SITE
Chingerup Brook
BORDEN-BREMER BAY RD
CHILLINUP RD
Fallinup River

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

Subject Site
Other Lots

Bush Fire Prone Areas

Bushfire Prone Areas (2021)

0 1 2 3
Kilometres

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

Aerial Imagery : Landgate/SLIP
Image Date : 2014

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 15/03/2023
Map updated by: Ian 15/03/2023
A3 Scale 1:50,000

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2023\230065 - 1287 Boxwood Hill-Ongerup Road Boxwood Hill - Greening Australia (BMP)\Mapping\MXD\230065_Fig1-2_BPA_1287 Boxwood Hill.mxd

1.2 The Bushfire Management Plan (BMP)

1.2.1 Commissioning and Purpose

Landowner / proponent:	Bush Heritage Australia PO Box 329 Flinders Lane, Vic 8009 Level 1, 395 Collins Street Melbourne Vic 3000
Bushfire Prone Planning commissioned to produce the BMP by:	Canopy Nature-based Solutions Greening Australia Level 4, 50 Pirie Street Adelaide SA 5000
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 Jerramungup

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 Bush Heritage Australia Plantation Management 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 Bush Heritage Australia Plantation Management (recognising that bushfire risk management is a responsibility of the Bush Heritage Australia Plantation Management).

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

Bush Heritage Australia Plantation Management 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

Indicative Planting Cells

Lot 1854 on Plan 209447, Area : 1066.8849 ha
1287 Boxwood Hill-Ongerup Road,
BOXWOOD HILL 6338
SHIRE OF JERRAMUNGUP

BOXWOOD HILL-ONGERUP RD

Lot 1854

Corackerup Creek

50 kl Water Tank

A
B
C
D
E
F
G

2.2504 ha
6.0042 ha
4.4216 ha
0.2399 ha
3.9278 ha
6.3615 ha
2.3388 ha
15.9981 ha
1.8408 ha
21.9831 ha
2.5619 ha

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

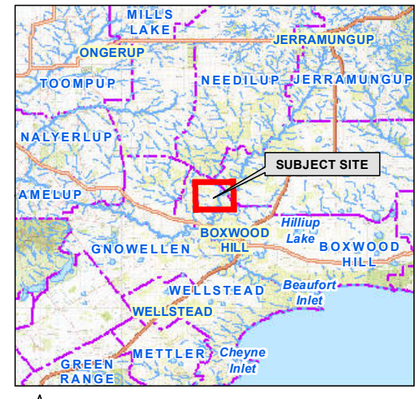
- Subject Site
- Ediegarrup Project Area
- 2023 Planting Area
- Other Planting Areas
- 50 kl Water Tank
- Dam

Firebreaks

- 6m Firebreak
- 10m Firebreak
- 15m Firebreak

0 200 400 600 800 1,000
Metres

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



Aerial Imagery : Landgate/SLIP
Image Date : 2014

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 17/03/2023
Map updated by: Ian Ross 17/03/2023
A3 Scale 1:22,500

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2023\230065 - 1287 Boxwood Hill-Ongerup Road Boxwood Hill - Greening Australia (BMP)\Mapping\MXD\230065_Fig2_PLANT_1287 Boxwood Hill-Ongerup Rd.mxd

1.5 Risk Management (basic)

Bush Heritage Australia Plantation Management 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. Bush Heritage Australia Plantation Management 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.

Bush Heritage Australia Plantation Management 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. Bush Heritage Australia Plantation Management 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. Bush Heritage Australia Plantation Management 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

Bush Heritage Australia Plantation Management are to implement a defined "initial attack" capability for bushfire response within the plantation site to be defined and established in accordance with the Bush Heritage Australia Plantation Management risk-based approach. The approach should incorporate a daily readiness and preparedness guideline which is informed by the fire danger rating and levels of fire activity on any given day. Preparedness guideline should include:

- A Pre-Incident Plan, revised annually, which identifies resources and procedures for daily activities and requirements for fire preparedness and response;
- A Fuel Management Plan, revised annually, with scheduled mitigation activities that reduce the risk of bushfire or support operational activities in terms of detection and response.

1.6.8 Staff

The "initial attack" capability requirements for the plantation site defines the number of fire operations and support staff that are necessary to fill rosters and provide initial attack to multiple fires on site at different locations at any given time. Plantation 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 "initial attack" numbers.

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

1.6.9 Training

Bushfire training is an essential component of safe, efficient and effective fire management operations. Bush Heritage Australia Plantation Management 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

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

As a minimum, it is recommended the plantation site is to ensure 1 x Light Tanker and 1 x Heavy Tanker (or other suitably constructed trailer mounted fire pump/water tank unit/s to ensure sufficient mobile water capacities and fire-fighting ability), is available for responding to bushfire within the plantation site boundaries.

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, Bush Heritage Australia Plantation Management 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 Fire Act 1954 and Bush Fire 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 Fire 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.

Radio Communications and Technology:

Bush Heritage Australia Plantation Management 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

Bush Heritage Australia Plantation Management 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

Bush Heritage Australia Plantation Management 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 Jerramungup Fire Control Information (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. (this should be undertaken in accordance with state fire legislation and local fire permit requirements.

1.8.2 Planning and Preparedness

Bush Heritage Australia Plantation Management 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 Fire Pre-Incident plans detailing fire suppression strategies and priorities, and
- Annual Fuel Management plans 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 planning is undertaken, and a plan adopted to ensure rapid and 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.

Plans are to contain the following information:

- Fire preparedness guidelines and fire readiness guide;
- First response arrangements;
- Local emergency services contact information;
- Links to weather information.

1.8.4 Pre-Incident Plans Review

Pre-incident Plans are reviewed annually, prior to the commencement of the fire season.

1.8.5 Hazardous Fuel Management Plan

The Fuel Management Plan 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.

- 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 Jerramungup Fire Control Information (Firebreak Notice).

Each plan should identify 6 year rolling targets for prescribed burning or mechanical methods of hazardous fuel reduction areas within the site, including weed management.

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.).

1.8.6 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 and prescriptions
- 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 Bush Heritage Australia Plantation Management 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 Bush Heritage Australia Plantation Management 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 3.1.0

Classified Vegetation & Topography (North)

Lot 1854 on Plan 209447, Area : 1066.8849 ha
1287 Boxwood Hill-Ongerup Road,
BOXWOOD HILL 6338
SHIRE OF JERRAMUNGUP

------ **LEGEND** ------

- Subject Site
- Other Lots
- Photo & Direction
- Overhead Powerlines
- 50 kl Water Tank
- Dam

Firebreaks

- 6m Firebreak
- 10m Firebreak
- 15m Firebreak

Classified Vegetation

- Class (A) Forest
- Class (D) Scrub
- Class (G) Grassland
- Exclusion 2.2.3.2

0 200 400 600 800
Metres

------ **LOCALITY** ------

Aerial Imagery : Landgate/SLIP
Image Date : 2014

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 17/03/2023
Map updated by: Ian Ross 17/03/2023
A3 Scale 1:12,500

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2023\230065 - 1287 Boxwood Hill-Ongerup Road Boxwood Hill - Greening Australia (BMP)\Mapping\MXD\230065_Fig3-1-0_VEG_NORTH_1287 Boxwood Hill.mxd

Figure 3.1.1

Classified Vegetation & Topography (South)

Lot 1854 on Plan 209447, Area : 1066.8849 ha
1287 Boxwood Hill-Ongerup Road,
BOXWOOD HILL 6338
SHIRE OF JERRAMUNGUP

------ **LEGEND** ------

- Subject Site
- Other Lots
- Photo & Direction
- Dam

Firebreaks

- 6m Firebreak
- 10m Firebreak
- 15m Firebreak

150m Vegetation Assessment Area

- 150m from Subject Site

Classified Vegetation

- Class (A) Forest
- Class (D) Scrub
- Class (G) Grassland

0 200 400 600 800
Metres

------ **LOCALITY** ------

Aerial Imagery : Landgate/SLIP
Image Date : 2014

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 15/03/2023
Map updated by: Ian 15/03/2023
A3 Scale 1:12,500

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2023\230065 - 1287 Boxwood Hill-Ongerup Road Boxwood Hill - Greening Australia (BMP)\Mapping\MXD\230065_Fig3-1-1_VEG_SOUTH_1287 Boxwood Hill.mxd

Figure 3.2

BAL Assessment Map

Lot 1854 on Plan 209447, Area : 1066.8849 ha
1287 Boxwood Hill-Ongerup Road,
BOXWOOD HILL 6338
SHIRE OF JERRAMUNGUP

------ **LEGEND** ------

Existing Building
- Sheds
- Water Tank

150m Vegetation Assessment Area
- 150m from Subject Site

Asset Protection
- 20m Local Government APZ
- 50m Plantation APZ

Classified Vegetation
- Class (A) Forest
- Class (D) Scrub
- Class (G) Grassland
- Exclusion 2.2.3.2
- APZ Distance

0 20 40 60 80
Metres

------ **LOCALITY** ------

Aerial Imagery : Landgate/SLIP
Image Date : 2014

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 15/03/2023
Map updated by: Ian 15/03/2023
A3 Scale 1:1,500

BUSHFIRE PRONE PLANNING

Map Document Path / Name: K:\Projects\Jobs 2023\230065 - 1287 Boxwood Hill-Ongerup Road Boxwood Hill - Greening Australia (BMP)\Mapping\MXD\230065_Fig3-2_BAL_1287 Boxwood Hill.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)	**N/A**	
Types Identified	Sown pasture G-26 Tussock grassland G-22				
Effective Slope	Measured	-	Applied Range (Method 1)	Downslope >0-5 degrees	
Foliage Cover (all layers)	<10%	Shrub/Heath Height	N/A	Tree Height	N/A
Additional Justification:	Areas of grass/crops patchy and sandy. Large areas of gently undulating grass and cropping/grazing land.				
Post Development Assumptions:	Vegetation is on-site and under the control of the landowner. Classified as grassland as this on-site area is not identified as changing in land use at this time.				

PHOTO ID: 15

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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	-	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	<10%	Shrub/Heath Height	N/A	Tree Height	N/A	
Additional Justification:	Areas of grass/crops patchy and sandy. Large areas of gently undulating grass and cropping/grazing land.					
Post Development Assumptions:	Vegetation is onsite and will have some degree of fuel load management in Cells (<30ha) 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: 19	PHOTO ID: -

VEGETATION AREA 1						
Classification (Existing)	**G. GRASSLAND**		Classification (Post-Development)	**N/A**		
Types Identified	Sown pasture G-26 Tussock grassland G-22					
Effective Slope	Measured	-	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	<10%	Shrub/Heath Height	N/A	Tree Height	N/A	
Additional Justification:	Areas of grass/crops patchy and sandy. Large areas of gently undulating grass and cropping/grazing land.					
Post Development Assumptions:	Vegetation is on-site and under the control of the landowner. Classified as grassland as this on-site area is not identified as changing in land use at this time.					

PHOTO ID: 22

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PHOTO ID: 24

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VEGETATION AREA 1					
Classification (Existing)	**G. GRASSLAND**		Classification (Post-Development)	**N/A**	
Types Identified	Sown pasture G-26 Tussock grassland G-22				
Effective Slope	Measured	-	Applied Range (Method 1)	Downslope >0-5 degrees	
Foliage Cover (all layers)	<10%	Shrub/Heath Height	N/A	Tree Height	N/A
Additional Justification:	Areas of grass/crops patchy and sandy. Large areas of gently undulating grass and cropping/grazing land. (Grassland central background of Photo ID: 27)				
Post Development Assumptions:	Vegetation is off-site and not under the control of the landowner. Classified as grassland as this off-site area is not identified as changing in land use at this time.				

PHOTO ID: 25

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PHOTO ID: 27

PHOTO ID: 28

PHOTO ID: 29

PHOTO ID: 30

VEGETATION AREA 1						
Classification (Existing)	**G. GRASSLAND**		Classification (Post-Development)	**N/A**		
Types Identified	Sown pasture G-26 Tussock grassland G-22					
Effective Slope	Measured	-	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	<10%	Shrub/Heath Height	N/A	Tree Height	N/A	
Additional Justification:	Areas of grass/crops patchy and sandy. Large areas of gently undulating grass and cropping/grazing land. (Grassland of foreground and central background of Photo ID: 31)					
Post Development Assumptions:	Vegetation is off-site and not under the control of the landowner. Classified as grassland as this off-site area is not identified as changing in land use at this time.					

PHOTO ID: 31

PHOTO ID: 32

VEGETATION AREA 2							
Classification (Existing)	**D. SCRUB**			Classification (Post-Development)	**D. SCRUB**		
Types Identified	Closed scrub D-13		Low shrubland C-12		Tussock grassland G-22		
Effective Slope	Measured	-		Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 3m		
Additional Justification:	Mixed species scrub composition including Eucalypts, Banksia and Native Conifers. Understory of unmanaged tall grass. Land is undulating across the broader area.						
Post Development Assumptions:	Vegetation is onsite and will have some degree of fuel load management in Cells (<30ha) 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: 33

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VEGETATION AREA 2						
Classification (Existing)	**D. SCRUB**		Classification (Post-Development)	**D. SCRUB**		
Types Identified	Closed scrub D-13		Low shrubland C-12		Tussock grassland G-22	
Effective Slope	Measured	-	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 3m	
Additional Justification:	Mixed species scrub composition including Eucalypts, Banksia and Native Conifers. Understory of unmanaged tall grass. Land is undulating across the broader area.					
Post Development Assumptions:	Vegetation is onsite and will have some degree of fuel load management in Cells (<30ha) 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.					

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VEGETATION AREA 2						
Classification (Existing)	**D. SCRUB**		Classification (Post-Development)		**D. SCRUB**	
Types Identified	Closed scrub D-13		Low woodland B-07		Tussock grassland G-22	
Effective Slope	Measured	-	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 3m	
Additional Justification:	Mixed species scrub composition including Eucalypts, Banksia and Native Conifers. Understory of unmanaged tall grass. Land is undulating in the broader area.					
Post Development Assumptions:	Vegetation onsite will have some degree of fuel load management in Cells (<30ha) 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.					

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VEGETATION AREA 2						
Classification (Existing)	**D. SCRUB**		Classification (Post-Development)		**D. SCRUB**	
Types Identified	Closed scrub D-13		Low woodland B-07		Tussock grassland G-22	
Effective Slope	Measured	-	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 3m	
Additional Justification:	Mixed species scrub composition including Eucalypts, Banksia and Native Conifers. Understory of unmanaged tall grass. Land is undulating in the broader area.					
Post Development Assumptions:	Vegetation onsite will have some degree of fuel load management in Cells (<30ha) 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.					

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VEGETATION AREA 2						
Classification (Existing)	**D. SCRUB**		Classification (Post-Development)		**D. SCRUB**	
Types Identified	Closed scrub D-13		Low woodland B-07		Tussock grassland G-22	
Effective Slope	Measured	-	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 3m	
Additional Justification:	Mixed species scrub composition including Eucalypts, Banksia and Native Conifers. Understory of unmanaged tall grass. Land is undulating in the broader area.					
Post Development Assumptions:	Vegetation onsite will have some degree of fuel load management in Cells (<30ha) 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.					

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VEGETATION AREA 2						
Classification (Existing)	**D. SCRUB**		Classification (Post-Development)		**D. SCRUB**	
Types Identified	Closed scrub D-13		Low shrubland C-12		Tussock grassland G-22	
Effective Slope	Measured	-	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 3m	
Additional Justification:	Mixed species scrub composition including Eucalypts, Banksia and Native Conifers. Understory of unmanaged tall grass. Land is undulating in the broader area.					
Post Development Assumptions:	Vegetation is off-site and classified in its current state.					

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VEGETATION AREA 2						
Classification (Existing)	**D. SCRUB**		Classification (Post-Development)		**D. SCRUB**	
Types Identified	Closed scrub D-13		Low shrubland C-12		Tussock grassland G-22	
Effective Slope	Measured	-	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	>30%	Shrub/Heath Height	1-2m	Tree Height	Up to 3m	
Additional Justification:	Mixed species scrub composition including Eucalypts, Banksia and Native Conifers. Understory of unmanaged tall grass. Land is undulating in the broader area.					
Post Development Assumptions:	Vegetation is off-site and classified in its current state.					

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VEGETATION AREA 3						
Classification (Existing)	**A. FOREST**			Classification (Post-Development)	**A. FOREST**	
Types Identified	Open forest A-03			Open tussock G-23	Tussock grassland G-22	
Effective Slope	Measured	-		Applied Range (Method 1)	Downslope >0-5 degrees	
Foliage Cover (all layers)	30-70%	Shrub/Heath Height	-	Tree Height	Up to 30m	
Additional Justification:	Large areas of gently undulating grass and cropping land interface with Eucalypts plantation trees. Areas of grass/crops patchy and sandy. Plantation default classification Class A – Forest.					
Post Development Assumptions:	Vegetation is onsite. Class A Forest mix plantation, and therefore classification on worst case scenario must be applied to the revegetated condition.					

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VEGETATION AREA 3						
Classification (Existing)	**A. FOREST**		Classification (Post-Development)	**A. FOREST**		
Types Identified	Open forest A-03		Tussock grassland G-22		Sparse open tussock G-24	
Effective Slope	Measured	-	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	30-70%	Shrub/Heath Height	-	Tree Height	Up to 30m	
Additional Justification:	Large areas of gently undulating grass and cropping land interface with Eucalypts plantation trees. Areas of grass/crops patchy and sandy. Plantation default classification Class A – Forest.					
Post Development Assumptions:	Vegetation is onsite. Class A Forest mix plantation, and therefore classification on worst case scenario must be applied to the revegetated condition.					

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VEGETATION AREA 3							
Classification (Existing)	**A. FOREST**			Classification (Post-Development)		**A. FOREST**	
Types Identified	Open forest A-03		Open tussock G-23			Tussock grassland G-22	
Effective Slope	Measured	-		Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	30-70%	Shrub/Heath Height	-		Tree Height	Up to 30m	
Additional Justification:	Large areas of gently undulating grass and cropping land interface with Eucalypts plantation trees. Areas of grass/crops patchy and sandy. Plantation default classification Class A – Forest.						
Post Development Assumptions:	Vegetation is onsite. Class A Forest mix plantation, and therefore classification on worst case scenario must be applied to the revegetated condition.						

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VEGETATION AREA 3						
Classification (Existing)	**A. FOREST**		Classification (Post-Development)		**A. FOREST**	
Types Identified	Open forest A-03		Open tussock G-23		Tussock grassland G-22	
Effective Slope	Measured	-	Applied Range (Method 1)		Downslope >0-5 degrees	
Foliage Cover (all layers)	30-70%	Shrub/Heath Height	-	Tree Height	Up to 30m	
Additional Justification:	Large areas of gently undulating grass and cropping land interface with Eucalypts plantation trees. Areas of grass/crops patchy and sandy. Plantation default classification Class A – Forest.					
Post Development Assumptions:	Vegetation is onsite. Class A Forest mix plantation, and therefore classification on worst case scenario must be applied to the revegetated condition.					

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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 located within close proximity to the existing sheds will incorporate the required apparatus for fire appliance connection. 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. Dams on the site identified as a secondary firefighting water source. Dams identified for use for fire fighting operations are to include provision for: • Hard standing to provide safe access to fire appliances to draft from the dams at summer low water line; • A fixed suction point where it is not possible to provide hard standing to the waters edge. 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.

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PHOTO ID: *Water Point Site

*A strategic water supply point will be located at the existing shed site. A minimum of 50,000ltrs of water will be permanently available for initial use during bushfire response. Tank/s will be surrounded by an asset protection zone to limit radiant heat exposure to the tank. Tank/s will be supplied from a dam, with water pumped to the tank to ensure a permanent supply of water (in addition to rain harvesting from the shed). Refer Appendix G for technical standards.

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/m^2, 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 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 proposed. The existing local road network services the property.					
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/m^2).
Supporting Assessment Details: Boxwood Hill-Ongerup 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 (upgraded where required) 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.	

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.

The required couplings, access, turn-around and hardstand area will be provided.

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

Dams on the site identified as a secondary firefighting water source can provide additional water. The associated required infrastructure and apparatus will be provided where identified as an additional requirement.

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 Jerramungup Fire Control 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	The tank strategic water point site and the secondary water supply dams will be sign posted as identified water sources for fire fighting operations.
7	Implement the bushfire protection measures that have been established within this BMP as measures additional to those established by the acceptable solutions.

8	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.
9	Prior to occupancy, all actions contained within the 'Pre-Season Preparation Procedure' established by the Bushfire Management Plan, must be completed.
10	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 infrastructure, supply tanks, dams 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	Prepare operational plans to implement the bushfire protection measures that have been established within this BMP as measures additional to those established by the acceptable solutions: 1. Prescribed Burning Plan; 2. Annual Fuel Management Plan; 3. Pre Incident Plan.

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 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

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.	Moderate Hazard
	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.	
e.g. Plantation 6 to 10 years after planting	Planting format will result in canopy closure within plantation.	Moderate to High Hazard unless fuel loads are reduced
	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 < 8t/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	Fine fuels may re-accumulated rapidly in the first four years after fire. At 6 years, fuel weight can stabilize at about 6-8 tonnes per hectare. Live scrub contributes to about 50% to the total fuel weight, with dead suspended scrub and ground litter making up the balance. The amount of fuel accumulated 4 years after a fire (~5 tonnes per hectare) is sufficient to support an intense and fast moving fire under extreme fire weather conditions, particularly where wind driven. This rapid initial accumulation of fuel means that buffers burnt for bushfire control purposes will only remain effective for about 3-4 years.	High Hazard

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 of Calculation input variables applied to the Determination of Separation Distances Corresponding to BAL'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	3.0								
2	(D) Scrub		Upslope or flat 0	0								
2	(D) Scrub		Downslope >0-5	3.5								
3	(A) Forest		Upslope or flat 0	0								
3	(A) Forest		Downslope >0-5	2.0								

[1] All data and information supporting the determination of the classifications and values stated in this table and any associated justification, is presented in Figure 3.1.

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 – undulating land <5 degrees slope

Table A1.3: Vegetation separation distances corresponding to radiant heat levels and illustrated as BAL Separation Distances 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 (Downslope >0 to 5)	<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 (Downslope >0 to 5)	<11	11-<15	15-<22	22-<31	31-<100	>100		
3	(A) Forest (Flat of Upslope)	<16	16-<21	21-<31	31-<42	42-<100	>100	-	-
3	(A) Forest (Downslope >0 to 5)	<20	20-<27	27-<37	37-<50	50-<100	>100		
[1] All calculation input variables are presented in Table A1.2.									

1. The Shire of Jerramungup 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 Figure 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)	No greater than 30 hectares for each 'Cell' (Can be considered up to 100 hectares depending on local conditions, plantation species, if endorsed by the Shire of Jerramungup).		
Firebreaks & Access	15 metre bare earth immediately inside all external boundaries of the plantation areas. A minimum width of 6 metres of bare earth for all internal firebreaks for compartments (Cells) not larger than 30 hectares. A minimum 10 metre wide bare earth firebreak between compartments where one or both of the compartments exceed 30 ha in area. Maintained in a trafficable condition for emergency vehicles (fire appliances) with a vertical axis clearance of 5 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 50,000ltrs. Water sources are required to be positioned to provide a maximum 20 minute refill turnaround from anywhere within the plantation. (No further than 5 kilometres from the plantation area). 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

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:	
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	
		Offsite	TBC prior to operation / Name	Phone
		Offsite	TBC prior to operation / Name	Phone
		Offsite	TBC prior to operation / Name	Phone

UTILITIES / MEDICAL / ASSISTANCE

AGENCY/ORGANISATION	SERVICES	CONTACT
Plantagenet Hospital	Medical services	(08) 9892 1222
Albany Health Campus	Medical services	(08) 9892 2222
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.

APPENDIX E: ONSITE VEGETATION MANAGEMENT - THE APZ

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:

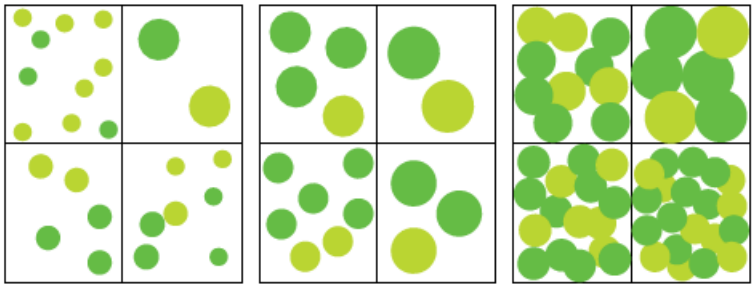
- Schedule 1: Standards for Asset Protection Zones (see extract below) established by the Guidelines; and
- The associated explanatory notes (Guidelines E2) that address (a) managing an asset protection zone (APZ) to a low threat state (b) landscaping and design of an asset protection zone and (c) plant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

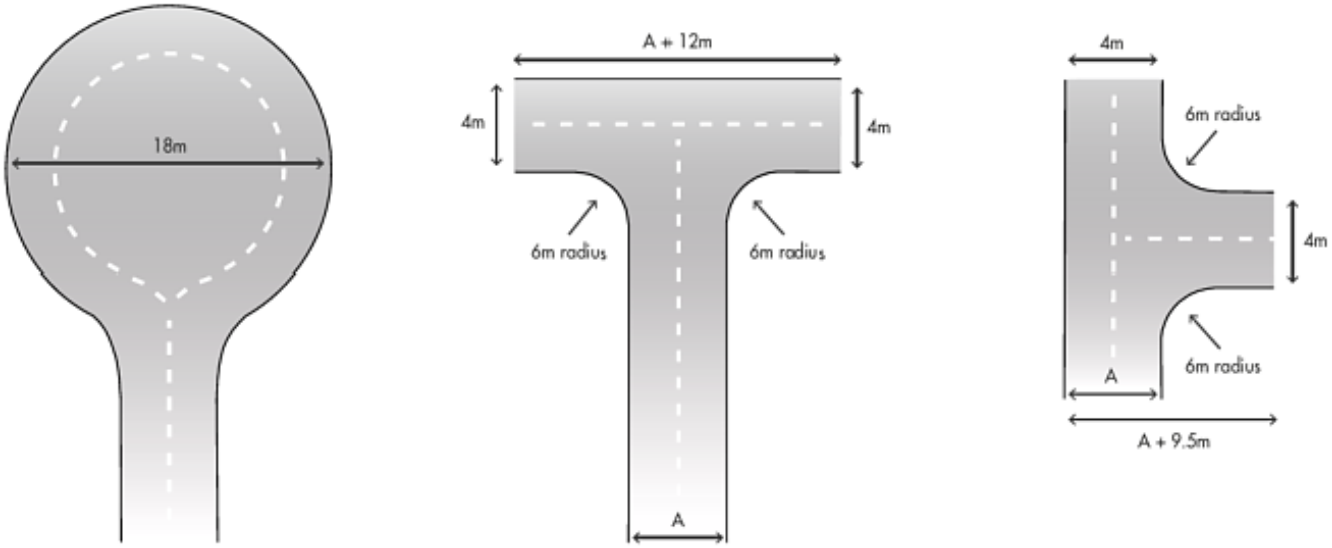
APPENDIX F: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

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.

APPENDIX G: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER SUPPLY

G1: 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

APPENDIX H: BUSHFIRE WARNINGS – WHEN A BUSHFIRE IS IDENTIFIED

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.

Moderate: Plan and prepare.
Most fires can be controlled. Stay up to date and be alert for fires in your area.

High: Be ready to act.
Fires can be dangerous. Decide what you will do if a fire starts.
Leave bushfire risk areas if necessary.

Extreme: Take action now to protect your life and property.
Fires will spread quickly and be extremely dangerous. Put your bushfire plan into action.
If you and your property are not prepared to the highest level, plan to leave early.

Catastrophic: For your survival, **leave bushfire risk areas.**
These are the most dangerous conditions for a fire. If a fire starts and takes hold, lives are likely to be lost. Homes cannot withstand fires in these conditions.

When there is minimal risk, Fire Danger Ratings will be set to **'No Rating'**. On these days you still need to remain alert and abide by local seasonal laws and regulations.

Monitor conditions and emergency.wa.gov.au for ratings and bushfire warnings. If a fire starts near you, take action immediately to protect your life. Do not wait for a warning.

Your life may depend on the decisions you make, even before there is a fire. Create or review your bushfire plan at mybushfireplan.wa.gov.au

GOVERNMENT OF WESTERN AUSTRALIA | DFES Department of Fire & Emergency Services | HOW FIREPROOF IS YOUR PLAN? | AFDRS

APPENDIX J: BUSHFIRE RISKS AND DANGERS

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**

APPENDIX K: GUIDELINES FOR TRAVELLING IN CARS DURING A BUSHFIRE

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

November/2021/V1.0

GOVERNMENT OF WESTERN AUSTRALIA
DFES Department of Fire & Emergency Services

HOW FIREPROOF IS YOUR PLAN?

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.

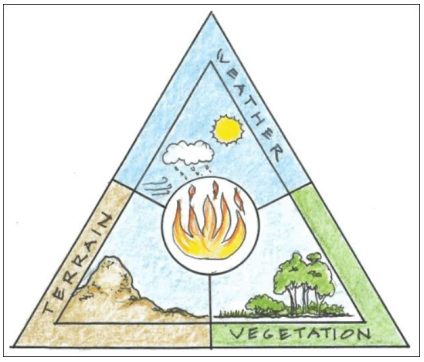
The information establishes the key factors to be considered in understanding the types and scale of key bushfire behaviours that can be expected to impact the site on a given day. These factors are the type of vegetation that exists on the land surrounding the subject premises/facility, the relevant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



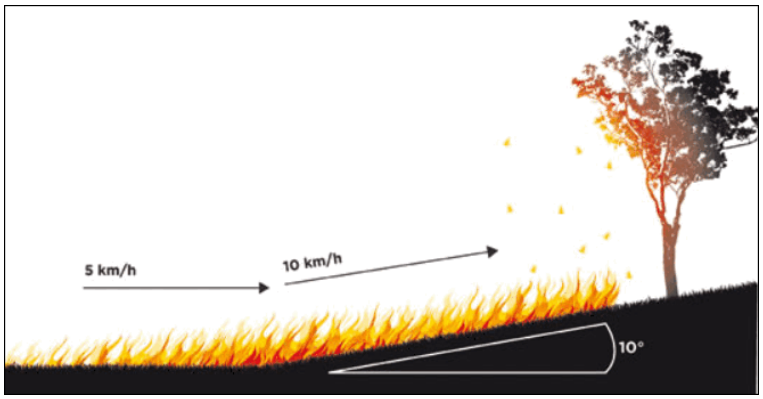
This is known as the fire behaviour triangle – because all three factors combine to shape the characteristics of the bushfire (source: CSIRO 'Bushfire best practice guide' at … research.csiro.au/bushfire/).

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.



(source: Country Fire Authority, Victoria).

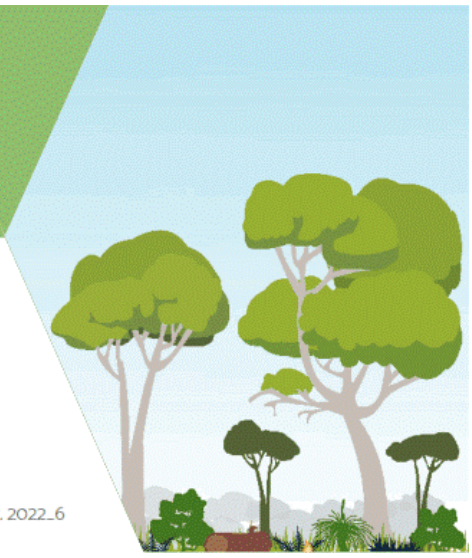
For every 10˚ slope, the fire will double its speed. For example, if a fire is travelling at 5 km per hour along flat ground and it hits a 10˚ slope it will double in speed to 10 km per hour up the hill. By increasing in speed the fire also increases in intensity, becoming even hotter.

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

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. Some forest exists as plantation within the site.
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. Forest areas are not prevalent in the surrounding area.
Spinifex	Woodland and shrubland with a hummock grass understorey. Includes mallee if spinifex understorey.	N/A
Pine	Pine plantations	N/A

FOREST



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

Source: AFDRS v. 2022_6

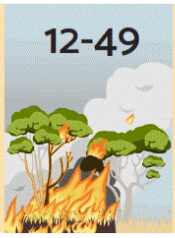
FDR	INDICATIVE BUSHFIRE BEHAVIOUR			
NO RATING	MAX FLAME HEIGHT <1 m	0-5	RATE OF SPREAD 0-40 m/hr	Fire difficult to ignite and sustain. Fires generally unlikely to spread and likely to self-extinguish.
	<4 m	6-11	20-110 m/hr	Slow spreading fires, typically involving surface and near-surface fuels and sometimes bark and elevated fuels. Spotting is sporadic and limited to short-distances.
MODERATE	2-8 m	12-23	60-600 m/hr	Actively spreading fires typically involving surface, near-surface, elevated and bark fuel layers and occasionally canopy fuels. Low-moderate spotting frequency; isolated medium range spotting can occur.
HIGH	7-14 m	24-49	0.3-1 km/hr	Rapidly spreading fires with potential for development into large burn areas within burning period. Fires typically involving most fuel layers. Short-range spotting is prevalent, with possibility of medium range and occasional long-range distance spotting.
EXTREME	11 m - approx. double forest	50-99	0.7-3 km/hr	Fires likely to quickly transition to crowning. Possibility for fire behaviour to become erratic and plume driven. Strong convective column formation. Wind speed and direction likely to be erratic at times.
CATASTROPHIC	>30 m (approx. double forest height)	100+	>2 km/hr can be expected, possibly >3 km/hr	Fires likely to quickly transition to crowning. Possibility for fire behaviour to become erratic and plume driven. Strong convective column formation. Wind speed and direction likely to be erratic at times.

SPOTTING POTENTIAL
Potential for any spotting is very limited and likely **<150 m**
Potential for spotting is limited with short distance spotting possible up to **400 m**
Short distance spotting occurring with increasing frequency with possible medium distance spotting up to **2 km**
Short and medium distance spotting occurring with increasing frequency with possible long distance spotting up to **4 km**
High ember density in short and medium range with possible long distance spotting up to **12 km**
High ember density in short and medium range with possible long distance spotting occurring **20-30 km** ahead of the main fire front

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.
NO RATING	<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

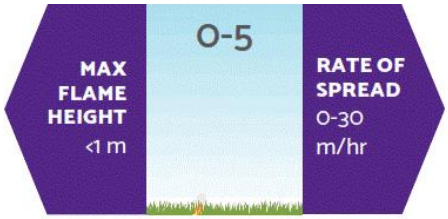
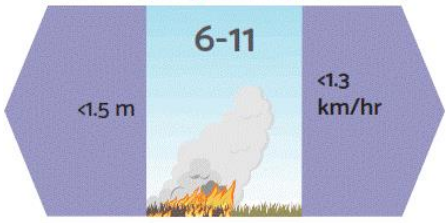
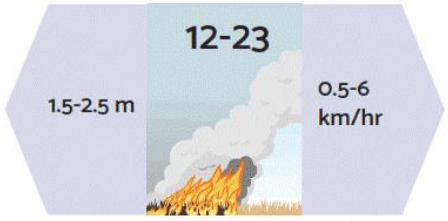
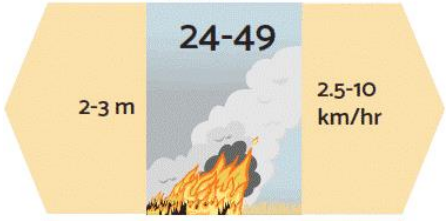
FDR	INDICATIVE BUSHFIRE BEHAVIOUR			
NO RATING	MAX FLAME HEIGHT <0.5 m	0-5	RATE OF SPREAD 0-20 m/hr	Flame dimensions are generally insufficient to breach sparse and discontinuous fuels or inter-hummock gaps.
	<0.5-1.5 m	6-11	20-150 m/hr	Sustained spread of fire.
MODERATE	1-4 m	12-23	150-1300 m/hr	Fast 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

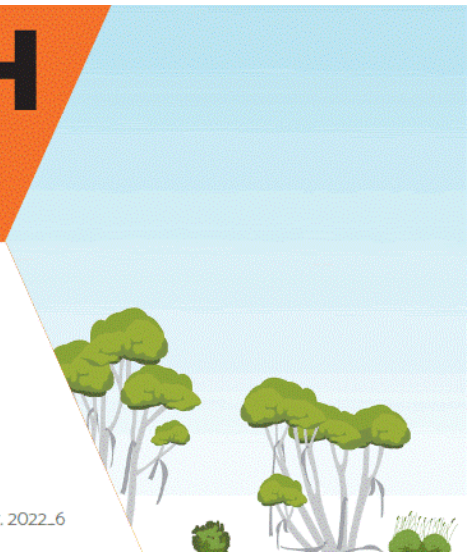
THE INDICATIVE FIRE BEHAVIOUR CORRESPONDING TO THE FIRE BEHAVIOUR INDEX (0-100) AND THE ASSOCIATED FIRE DANGER RATING (FDR)

Source: AFDRS v. 2022_6

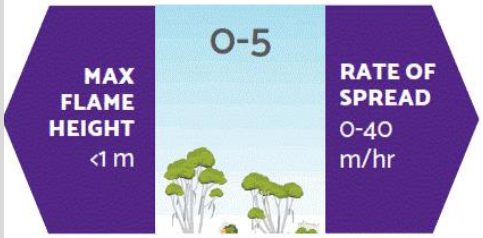
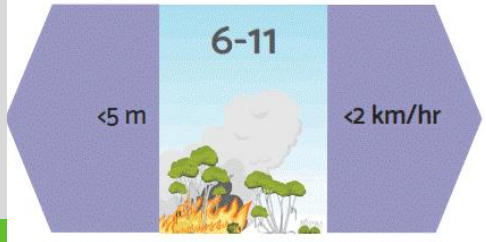
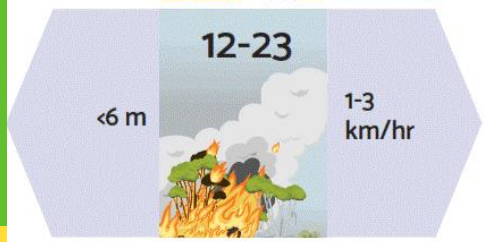
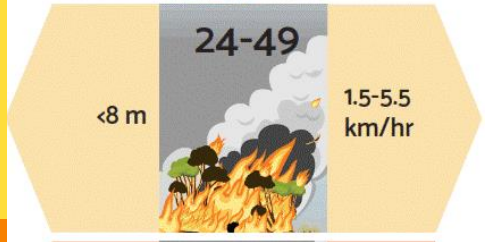
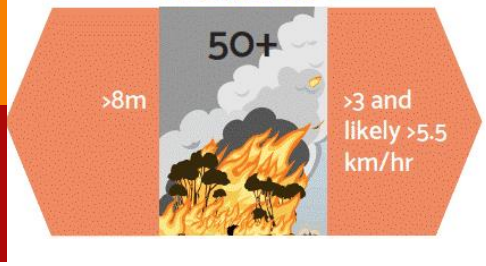
FDR	INDICATIVE BUSHFIRE BEHAVIOUR			
NO RATING		Fire difficult to ignite and sustain. Fires generally unlikely to spread and likely to self-extinguish.	**SPOTTING POTENTIAL** Potential for any spotting is very limited.
		Fire easily sustained. Typically wind driven fires that can spread quickly.	Potential 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.

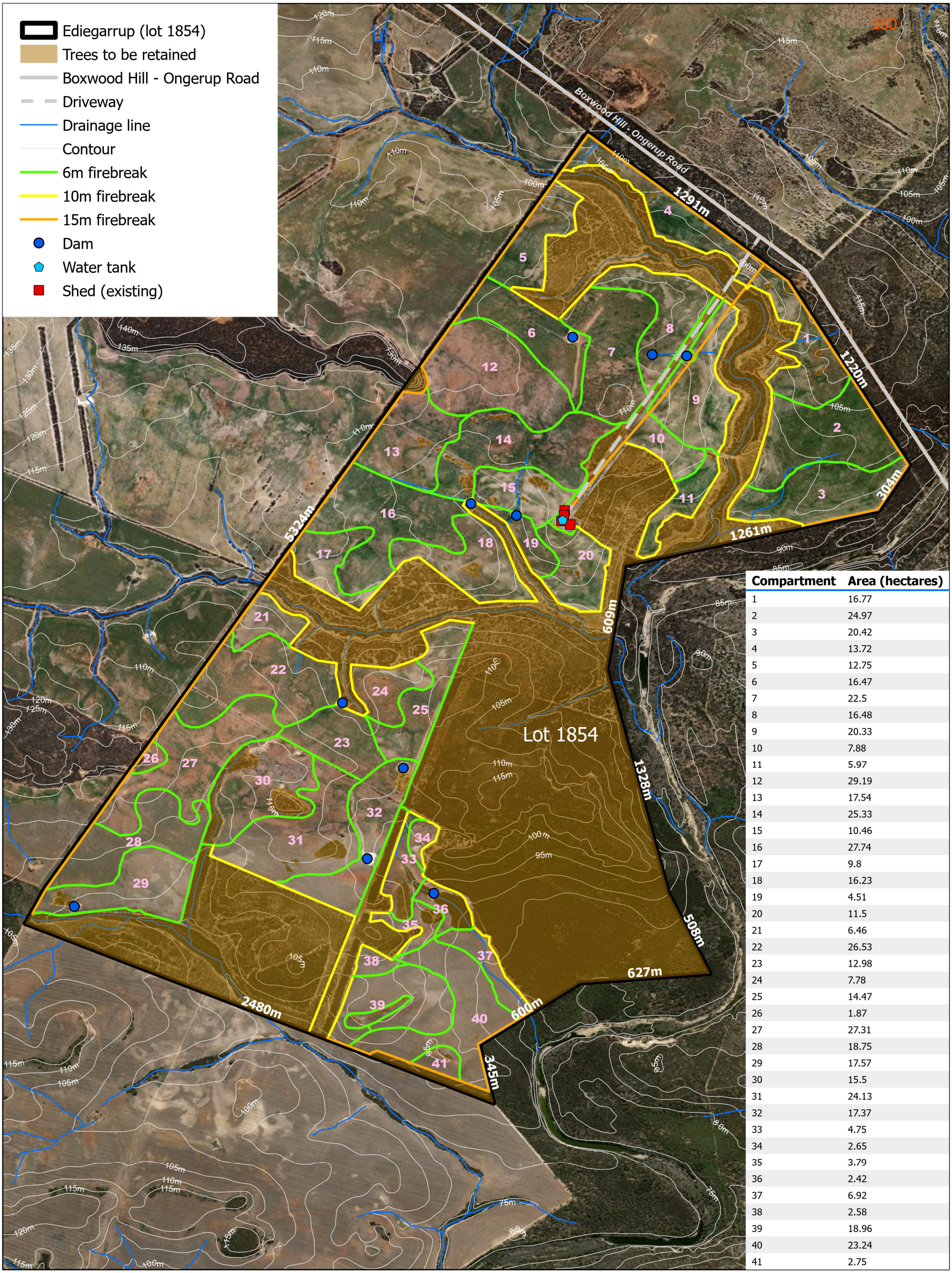
These barriers should be constructed using appropriate fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period.

- ☐ **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.



Compartment	Area (hectares)
1	16.77
2	24.97
3	20.42
4	13.72
5	12.75
6	16.47
7	22.5
8	16.48
9	20.33
10	7.88
11	5.97
12	29.19
13	17.54
14	25.33
15	10.46
16	27.74
17	9.8
18	16.23
19	4.51
20	11.5
21	6.46
22	26.53
23	12.98
24	7.78
25	14.47
26	1.87
27	27.31
28	18.75
29	17.57
30	15.5
31	24.13
32	17.37
33	4.75
34	2.65
35	3.79
36	2.42
37	6.92
38	2.58
39	18.96
40	23.24
41	2.75

Ediegarrup revegetation development application site plan

0 400 800 1,200 1,600

Metres

1:20,000 @ A3

N

Created by Paul Young 04/04/2023
Imagery credit: Maxar. Some data layers supplied by Bushfire Prone Planning
Path: \\bha-csc-svr-arc\GIS\Data\Workspaces\West\Reserves\WA\FSTR_Ediegarrup\Reveg_plan_2023\ArcGISPro_project\Ediegarrup_reveg_plan.aprx

Tuesday, 7 March 2023

Mr Martin Cuthbert
CEO
Shire of Jerramungup
PO Box
JERRAMUNGUP WA 6337

Dear Martin,

RE: Bush Heritage Australia – Ediegarrup proposed restoration.

South Coast NRM is writing to express our support for Bush Heritage Australia's proposed restoration works on Ediegarrup and the corresponding Development Application to the Shire of Jerramungup.

South Coast NRM understand that over the past year, in partnership with Greening Australia, Bush Heritage Australia have been developing a plan to restore the cleared portions of Ediegarrup using a biodiverse selection of local native plants utilising best practice restoration techniques. These works, if approved, will develop a critical connective corridor between Red Moort Reserve and other large remnant bush areas including Corackerup Creek reserve, Chingarrup Sanctuary and North to Nowanup and Corackerup Nature Reserve.

Ediegarrup is a priority site with a land holder working to maximise and enhance the biodiversity assets of the property in an important part of the landscape. The property lies within the Fitz-Stirling Priority Place designation under the Australian Government's Threatened Species Action Plan, whereby Priority Places recognise that some threatened species share the same habitat, and that place-based action can support protection and recovery of more than one species. Further, the work proposed will support the implementation of the Fitzgerald Biosphere Recovery Plan and the Fitzgerald Biosphere Action Plan, an initiative which Bush Heritage Australia, Shire of Jerramungup and South Coast NRM are a part of through their involvement with the Fitzgerald Biosphere Community Collective.

We consider that the Bush Heritage Australia proposal is well considered and well planned. It represents an approach to preserving, improving, and actively managing habitat in the South Coast region is critical if we are to reverse the biodiversity decline across the region. South Coast NRM acknowledges Bush Heritage Australia as leaders in their field and support the Development Application.

South Coast NRM also acknowledges the productive and positive relationships Bush Heritage Australia holds with the local community and industry and is pleased that there has been significant investment into the conservation projects within the Shire of Jerramungup region over the past 15 years.

South Coast NRM understands that this project plans to achieve the following outcomes:

- Revegetate approximately 600ha of cleared farmland in a strategically located area with a biodiverse mix of species based on local vegetation complexes and matched to soil types;
- Develop a connective corridor between important parcels of bushland and conservation estate.
- Create habitat for a range of species including the threatened Malleefowl, Carnaby's Cockatoo and Western Whipbird amongst others.
- Work alongside Aboriginal partners to deliver the revegetation program; and
- Provide ongoing management of the reserve to address weeds, fire, and feral animals.

Please do not hesitate to contact me if you would like more information.

Regards

Luke Bayley
Chief Executive Officer

Mr Alex Hams
Healthy Landscapes Manager
Bush Heritage Australia
88 Stead Rd, ALBANY WA 6330
alex.hams@bushheritage.org.au

Fitzgerald biosphere
WESTERN AUSTRALIA
Community Collective

Dear Mr Hams,

On behalf of the Fitzgerald Biosphere Community Collective (FBCC), I would like to endorse our support for Bush Heritage Australia (BHA) and their operations within the Fitz-Stirling region, in particular their plans for a 600 ha conservation connection project on their Ediegarrup property.

The FBCC is a group of organisations and individuals located in and/or with an interest in the conservation of biodiversity and sustainable management of resources (land, sea and water) in Fitzgerald Biosphere, and how this can support sustaining vibrant communities.

The Fitz- Stirling region is one of the most important areas of biodiversity in Australia, with a rich diversity of flora and fauna that has experienced widespread habitat fragmentation since the 1960's. BHA's vision is to contribute to conservation by developing connective corridors between biologically important parcels of privately-owned bushland and the State conservation estate to ensure future biodiversity protection in such a precious part of the world.

BHA's Ediegarrup 600ha revegetation project aims to repair fragmented habitat, it's strategically located for best connectivity conservation outcomes, using a biodiverse mix of plant species based on local provenance that corresponds to project area soil types. These elements will help to develop suitable connective corridors as habitat and important refugia for many vulnerable species, including but not limited to Malleefowl, Carnaby's Cockatoo, Western Whipbird, and Pygmy and Honey possums.

Leveraging restoration and connectivity frameworks developed at BHA properties such as Red Moort and Monjebup allows for tried and tested methods for collaborations with local communities, stakeholders and Noongar partners to deliver conservation outcomes at a landscape scale alongside the ability to research and address threats such as fire, weeds and feral predators into the future.

The work of BHA in the Fitz-Stirling corridor also brings in new nature-based and cultural interest revenue streams, which contribute to the local economy and well-being of our community. As such, the FBCC wishes to express support for the revegetation project and the ecological, cultural, economic and reputational benefits it will bring.

I can be contacted by mobile on 0439 936 591 if you would like any further information.

Nathan McQuoid
Chairperson
Fitzgerald Biosphere Community Collective

16 March 2023

To whom it may concern
Shire of Jerramungup

Restoration plantings on Kent Location 1854/1287 Boxwood Hill-Ongerup Rd – Ediegarrup

We understand Bush Heritage Australia is lodging a Development Application to enable ecological restoration plantings over some 600ha of this property. We strongly support that proposal, and see it as one of the essential actions needed to restore ecological health and resilience to this very important part of south-western Australia. As Council is no doubt aware, numerous scientific studies have documented the importance of restoration plantings across the southern parts of the Shire. These provide essential habitat for the richness of wildlife and plant species that occur there, improving ecological connectivity in a time of climate change, and strengthening the 'self-managing' ability of ecosystems, by restoring the key ecological functions that underpin ecological health.

We contend that the work being undertaken by Bush Heritage and the other conservation organisations and individuals in that part of the Shire is of national and international significance. In recent decades we have collectively come to understand that the remaining habitats in south-western Australia, and particularly along the south coast, are as biologically rich as the tropical rainforests and other iconic areas on Earth. But much of the area was cleared or damaged before we, as a society, really understood and appreciated their globally significant ecological importance, or learnt what was required to maintain this extraordinary biological richness over time.

We note that the large-scale clearing also occurred at a time when the rights of the Noongar people were disregarded.

Successive national State of the Environment reports have documented ongoing declines in ecological health across Australia, with few initiatives demonstrating progress in reversing that decline. You have one of those positive initiatives here in Jerramungup Shire, and we urge you to both support and be proud of what is being achieved. Bush Heritage's restoration planting at Ediegarrup will form another key element in a connectivity conservation initiative that ultimately stretches from the wet forests of the far south-west to inland Australia. A key immediate objective is restoring ecological connectivity between Stirling Range and Fitzgerald River National Parks.

We note that the proposed plantings will restore approximately 600ha of cleared farmland, using a biodiverse mix of species based on local vegetation complexes and wildlife habitat requirements. We have been assured that the work will be done alongside Noongar partners, including the team

based at Nowanup, who will be part of delivering the restoration and walk trail programs. Bush Heritage has now operated in your Shire for over twenty years, and have demonstrated their diligence in dealing with management concerns such as weeds, fire and feral animals.

While respecting that the Shire of Jerramungup currently has a Local Planning Policy that discourages the planting for conservation of farmlands, we urge Council to both support this current important initiative and consider what is a responsible planning approach to apply to these well identified ecological priority areas in the Shire, and the key role this can play in the Shire's approach to addressing climate change.

We are also keen to explore with Council how the ecological importance of both the area and the ecological initiatives underway can be built on to provide greater social and economic benefits to the Shire,

Perhaps most significantly, we are deeply concerned at the ongoing decline of the rural population base, and consider that the overall ecological program between the two national parks has matured to the point where it can become a source of greater local benefit.

Yours Sincerely

Keith Bradby
Gondwana Link
Chief Executive Officer

Re: Support for Bush Heritage Australia Development Application – Restoration of "Ediegarrup"

Greetings Shire of Jerramungup Staff & Councillors,

I write to you on behalf of North Stirlings Pallinup Natural Resources (NSPNR), in regards to Bush Heritage's proposed restoration of Ediegarrup.

NSPNR is in support of this project to revegetate the 600ha of cleared land. It is an incredible opportunity to create vital habitat for species in our area under threat including the Malleefowl & Carnaby Cockatoo, and connect to other areas of bush & reserve.

NSPNR have worked with Bush Heritage for several years and can attest to the high quality, well planned and executed projects they deliver and the value of their ongoing work in the area (and around the country).

This proposed project aligns with one of the 4 main objectives of NSPNR's Strategic Plan;

1. *Facilitate the protection and regeneration of the North Stirlings-Pallinup sub-region waterways and biodiversity assets.*
    1.5 riparian zone and priority landscape revegetation in the Fitz-Stirling corridor using biodiverse and endemic species within the next five years.

While in support of this project NSPNR acknowledges that projects of this nature lead to loss of agricultural land. Therefore, our support for this specific Bush Heritage project does not in any way reflect a general NSPNR policy on whole farm planting. NSPNR has assessed this project in isolation and any further proposed works of this nature, will continue to be assessed by NSPNR on a case by case basis.

Due to the following reasons we believe this project should be an exception & approved by the Shire;

- Integrity of the work Bush Heritage do & their organisation as a whole
- Integrity of this particular project
- The high value of the proposed project area – being part of the Fitz-Stirling macro corridor (lying within the Southwest Australia Global Biodiversity Hotspot)
- The involvement of indigenous partners and Greening Australia to support in delivering a high quality, culturally & environmentally sensitive project

We look forward to hearing the outcome of this application.

Regards,

Caroline House *(NSPNR Executive Officer)*

Rocky Eades
Director Nowanup Noongar Boodja Ltd.
284 Normans Rd
Gairdner WA 6337

M. +61 460 787 308
E. rocky@nowanup.com.au

To whom it may concern Shire of Jerramungup,

Support for Development Application Local Planning Policy #10 - Agroforestry and Plantations, Bush Heritage 1854/1287 Boxwood Hill-Ongerup Rd Eddiegarrup

We are writing in support of Bush Heritage Australia's lodgement of their proposed Development Application to enable ecological restoration plantings at their Eddiegarup property. We as local custodians strongly support this proposal and see it as a great opportunity to not only restore ecological health and resilience to the Boodja but also enrich the cultural assets within the flora and fauna species that return to healthy country. As Council would know, the importance of restoration plantings across the southern parts of the Shire provide essential habitat for the richness of wildlife and plant species that occur there, improving ecological connectivity in a time of climate change, and strengthening the 'self-managing' ability of ecosystems, by restoring the key ecological functions that underpin ecological health.

Large-scale clearing in Australia occurred at a time when the rights of the Noongar people were disregarded. The Noongar people wholly support the restoration work being undertaken by Bush Heritage and the other conservation organisations and individuals in the Shire as it is of national and international significance. The remaining habitats in south-western Australia, and particularly along the south coast, are biodiversity hotspots. But much of the area was cleared or damaged before the non-indigenous people really understood and

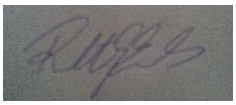
appreciated their globally significant ecological importance, or learnt what was required to maintain this extraordinary biological richness over time.

Bush Heritage's restoration planting at Ediegarrup will form a key element in a connectivity conservation initiative that ultimately stretches from the wet forests of the far south-west to inland Australia. A key immediate objective is restoring ecological connectivity between Stirling Range and Fitzgerald River National Parks which we at Nowanup are a part of.

We note that the proposed plantings will restore approximately 600ha of cleared farmland, using a biodiverse mix of species based on local vegetation complexes and wildlife habitat requirements. We have been assured that the work will be done alongside Noongar partners, including our team based at Nowanup, we will be part of delivering the restoration and walk trail programs. Bush Heritage have a good track record having operated in your Shire for over twenty years, and have demonstrated their diligence in dealing with management concerns such as weeds, fire and feral animals.

While respecting that the Shire of Jerramungup currently has a Local Planning Policy that discourages the planting for conservation of farmlands, we as Noongar people urge Council to both support this current important initiative and consider what is a responsible planning approach to care for Country in these well identified ecological priority areas in the Shire.

Yours Sincerely



Rocky Eades
17/03/2023
Chair of Nowanup Noongar Boodja Ltd