

FIRE MANAGEMENT PLAN

Lot 9500 Helena Valley Road

Helena Valley

Shire of Mundaring



FirePlan WA

January 2014

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Fire Management Plan Lot 9500 Helena Valley Road, Helena Valley**Prepared For****Benchmark Projects**

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Version 1		BWH	8.08.13
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Disclaimer: The measures contained in this fire management plan are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bush fire. All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith on the basis of information available to FirePlan WA at the time; and achievement of the level of implementation of fire precautions will depend among other things on the actions of the landowners or occupiers over which FirePlan WA has no control. Notwithstanding anything contained therein, FirePlan WA will not, except as the law may require, be liable for any loss or other consequences (whether or not due to the negligence of the consultants, their servants or agents) arising out of the services rendered by the consultants.

1.0 INTRODUCTION

The purpose of this Fire Management Plan is to detail the fire management methods and requirements that will be implemented for the subdivision of part of Lot 9500 Helena Valley Road, Helena Valley – “Site”. The “Site” is located between Old Helena Valley Road (northern boundary), Old Commonwealth Rifle Range (southern boundary) and Kadina Brook (eastern boundary). Refer Figure 1: Location Plan.

This fire Management Plan replaces the previous report of September 2009 for this Site.

This Fire Management Plan satisfies the requirements of the Shire of Mundaring and the Western Australian Planning Commission (WAPC) via Planning for Bush Fire Protection Edition 2 (WAPC and Department of Fire and Emergency Services 2010).

This Fire Management Plan will likewise outline the responsibility and timing for implementing and maintaining the fire protection measures and strategies contained within, allocating these responsibilities between individual land owners, the developers and the Shire of Mundaring.

As fire management strategies may require altering to meet changing weather, environment and land use needs, it must be advised that the provisions of the *Bush Fires Act 1954* and Regulations may still be enforced, in addition to this Fire Management Plan.

The Shire of Mundaring will be responsible for initiating a review of this Fire Management Plan as it may deem necessary to do so.

In the event of large bushfires it is essential that landowners understand that fire appliances may not be available to protect each dwelling/building so it is in the Landowners best interest to provide adequate fire protection to their assets, the minimum requirements are detailed in this Fire Management Plan.

The recommendations made within this Plan relating to the clearing or modification of vegetation to meet setback requirements does not constitute approval or authority to modify or remove vegetation. All such approvals must be undertaken in consultation with the relevant authorities.

In the Foreword of AS 3959- 2009 it states that “It should be borne in mind that the measures contained in this standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behavior of fire and extreme weather conditions.” This Fire Management Plan has been prepared in accordance with the acceptable solutions detailed in the Planning for Bush Fire Protection Edition 2 Guidelines.

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Figure 2 Development Layout



2.0 AIM

The aim of the Fire Management Plan is to reduce the occurrence of and minimise the impact of bush fires thereby reducing the threat to life, property and the environment.

The Fire Management Plan sets out to reduce this threat by:

- Identifying the objectives of this Fire Management Plan (Section 3)
- Providing a description as to, topography, cultural features and land use (Section 4);
- Identifying the potential bush fire issues within the Site (Section 5); and
- Outlining the fire mitigation strategies for the Site that will reduce the risk of bush fires impacting on the proposed subdivision including the potential threat and impact of bushfire to residents, fire fighters and environmental values, including identifying the parties responsible for undertaking these fire mitigation strategies (Section 6).
- Allow easy access and egress of fire fighters and residents if a fire does occur.

The Shire of Mundaring has the responsibility and powers under the Town Planning Scheme and the *Bush Fires Act 1954* to ensure that this Fire Management Plan, Shire of Mundaring Fire Control Notice and any Special orders issued under the *Bush Fires Act 1954* are complied with.

3.0 OBJECTIVES

The objectives of this Fire Management Plan are to:-

- Identify bushfire hazards and propose bush fire prevention measures for the Site;
- Identify access and egress for firefighting operations and residents;
- Identify and respond to bushfire hazards to special residential land use of the Site.
- Define the building construction standards where lots interface with vegetation within the Site;
- Identify current and future landowner, developer and Shire of Mundaring responsibilities for various components of this fire management plan; and
- Document in the Appendices section of this Fire Management Plan, the acceptable solutions adopted for the subdivision.

4.0 DESCRIPTION OF THE AREA

4.1 GENERAL

This Fire Management Plan applies to Lot 9500 Helena Valley Rd, Helena Valley which is to be subdivided into urban residential and an area of Public Open Space - Kadina Brook.

“The Site” is bounded by Old Helena Valley Road to the north, Kadina Brook to the east and Lot 911 Midland Road – Bushmead Rifle Range to the south.

The west side of Kadina Brook is proposed to be urban residential. The area to the east of Kadina Brook is urban residential, on the northern side of Helena Valley Road is urban residential and the area to the south (Lot 911 Bushmead Rifle Range- Located in the City of Swan) will be partially developed into urban residential and partly a Conservation Area. Along the southern boundary (between the Site and Lot 911) a 20 metre cleared reserve is located- within the City of Swan.

The area for urban residential is cleared and the Public Open Space (POS) located as the eastern end of the Site is to be landscape by the Developer and handed over to and managed by the Shire of Mundaring. A road will separate the residential area from the Public Open Space. See Section 4.4 for landscaping details.

Dwellings within 100 metres adjoining the POS and the Bushmead Rifle Range will be required to have their construction standard increased in accordance with the current adopted Australian Standard AS 3959 “Construction of Buildings in a Bush Fire Prone Area”.

4.2 CLIMATE

The Mediterranean climate experienced by the area in which Lot 9500 is located is characterized by hot dry summers and mild wet winters with the majority of rain falling in late autumn through to late spring. This rainfall supports substantial vegetation growth which dries off in Summer/Autumn. The bush fire season is generally from October to the following May, but is subject to seasonal changes and drought conditions.

In summer the area has strong easterly winds in the morning that ease off around midday and in the afternoon on most days a southwesterly wind occurs in the afternoon reducing the temperature by as much as ten degrees. See Figure 4 for a sample of the summer wind direction and strength that would be similar to this development site. January is typical wind direction and strength for the January to end of March each year.

The weather data for Perth Airport has been used as it is the nearest weather station with a complete set of data and is indicative of the weather at this site.

Table 1 Weather Data for Perth Airport – 1944-2013 (BOM Website August 2013)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Max Temperature (°C)	31.7	31.9	29.7	25.5	21.8	18.9	17.9	18.5	20.1	22.6	25.8	28.9	
Mean 3pm Temperature (°C)	29.9	30.2	28.1	24.2	20.6	17.8	16.8	17.3	18.8	21.1	24.2	27.1	
Mean 9am Relative Humidity (%)	51	53	57	66	74	81	82	78	71	62	55	52	
Mean 3pm Relative Humidity (%)	37	37	39	46	53	60	60	56	54	49	44	41	
Mean Monthly Rainfall (mm)	9.7	14.4	16.3	40.9	99.4	160.1	156.6	117.3	72.2	44.3	26.9	11.4	772

Figure 3 Sample of wind roses for January Observations from Perth Airport for 9.00AM & 3.00PM

Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 30 Sep 2010)

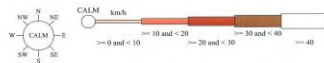
Custom times selected, refer to attached notes for details

PERTH AIRPORT

Site No: 009021 - Opened Jan 1944 - Still Open - Latitude: -31.9275° - Longitude: 115.9764° - Elevation 15.m

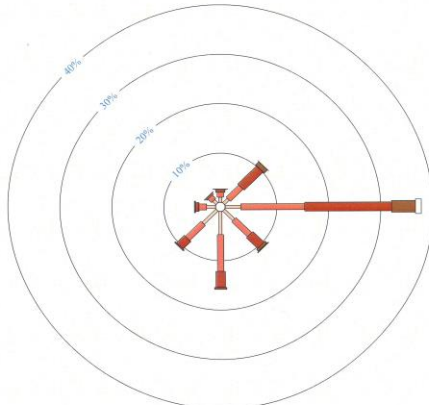
An asterisk (*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



9 am Jan
2045 Total Observations

Calm 5%



Rose of Wind direction versus Wind speed in km/h (01 May 1944 to 30 Sep 2010)

Custom times selected, refer to attached notes for details

PERTH AIRPORT

Site No: 009021 - Opened Jan 1944 - Still Open - Latitude: -31.9275° - Longitude: 115.9764° - Elevation 15.m

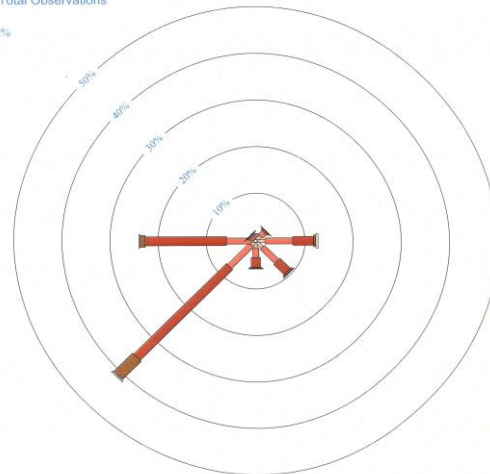
An asterisk (*) indicates that calm is less than 0.5%.

Other important info about this analysis is available in the accompanying notes.



3 pm Jan
2041 Total Observations

Calm 2%



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4.3 TOPOGRAPHY

The slope of the site is within the 0°-5° range and is from the southwest to the northeast. 0°-5° will be used as a factor in determining setbacks of the development from retained vegetation and the construction standard of dwellings in accordance with AS 3959 "Construction of Buildings in Bush Fire Prone Areas" (detailed in Section 7.2).

4.4 BUSH FIRE FUELS

The "Site" consists of Grassland (Class G) and Woodlands (Class B) in the south east corner of the Site and Shrubland (Class C) and areas of turf in the proposed POS. The adjoining area to the south Bushmead Rifle Range is Low Open Forest.

Bush fire fuel loads in accordance with Table B2 of AS 3959 - Woodland would vary between 15-25 tonnes/ha, Shrubland-POS (Class C) would be 15 tonnes/ha, Grassland (Class G) would be approximately 4 tonnes/ha and Low Open Forest would be between 25-35 tonnes/ha. The Woodland in the south east corner will be partly cleared with the remainder being included in the Kadina Brook Reserve. Some areas of the proposed POS will be planted with Turf and reticulated. See Figure 4.

The vegetation within the Bushmead Rifle Range and Kadina Brook will be a factor in determining the construction standards of dwelling within 100 metres of the vegetation See Section 7.2.

4.5 LAND USE

The “Site” will be developed into Residential and POS/drainage (Kadina Brook) located at the eastern boundary of the “Site” and a Reserve 27688 located along the southern boundary vested in the City of Swan.

4.6 LOCAL ASSETS

The local assets of the site and adjoining areas rural residential lots to the east, power lines, residential areas, proposed residential buildings and POS/drainage areas – Kadina Brook and the Conservation Zone retained as part of the proposed Bushmead Project .

4.7 ACCESS

Access will be via 3 access points off the Old Helena Valley Road which will link into Helena Valley Road.

4.8 WATER SUPPLIES

Mains reticulated water will be supplied to the site.

4.8.1 Water for Fire Fighting

Fire hydrants and Road/Pole markings will be installed by the Developer in accordance with the “*Water Corporations No. 63 Water Reticulation Standard*”.

4.8.2 Domestic Water Supply

Each lot will be supplied with mains reticulated water.

Figure 4 Proposed Landscape Plan A of Kadina Brook POS South



Proposed Landscape Plan B of Kadina Brook POS North



5.0 BUSH FIRE ASSESSMENT

5.1 BUSH FIRE HISTORY

The Developer has no recorded bush fire history for the site.

5.2 BUSH FIRE RISK

As most bushfires are caused by human activity, either by deliberate actions or carelessness, risk can be aligned with human activity and available fuel sources. The combination of people, property and infrastructure systems (transport, communications etc.) is components of the “risk” for the site. As people cause the majority of wildfires in this general area and have the assets in some way, shape or form, the table below rates the risk for the site based on the Department of Fire & Emergency Services (DFES) Rural Urban Bush Fire Threat Analysis tool.

Table 2 Bush fire Risk Assessment

Hazard Assessment

Scoring: High or Yes = 1 Low or No = 0

Ratings: Extreme = 6 High = 4 – 5 Medium = 2 – 3 Low = 0 – 1

Hazard Component	High or Yes	Low or No
<i>Likelihood of occurrence (risk of ignition)</i>		0
<i>Fuel load (vegetation) > standard (intensity)</i>	1	
<i>Vegetation assessment area with fire hazard (manageability)</i>	1	
<i>Hazard reduction <80% of assessment zone</i>	1	
<i>High visitor usage in area</i>		0
<i>Recent or proposed residential and industrial developments</i>	1	

Total 4 = high bush fire risk

Management Assessment

Scoring: High or Yes = 1 Low or No = 0

Ratings: Extreme = 4 High = 3 Medium = 2 Low = 1

Management Component	High or Yes	Low or No
<i>Easily accessible (access roads and trails)</i>	1	
<i>Fire agency response time > 30 minutes</i>		0
<i>Inadequate water supply</i>		0
<i>Inadequate resources</i>	1	

Total 2 = Medium management risk

Although the site indicates a high bush fire risk, the Fire Management Plan in conjunction with agency and Local Government requirements, aims at reducing this risk through mitigation works (Section 6) and sound response protocols. This will be achieved by setbacks from Bushmead Rifle Range and Public Open Space with management of setbacks to the Building Protection Zone standard.

5.3 BUSH FIRE HAZARD

In the WA Planning Commission's publication *Planning for Bush Fire Protection* Edition 2 (2010) (the "Guidelines") at Appendix 1 the methodology for classifying bush fire levels is detailed. The methodology rates bush fire hazard using vegetation type. The methodology is also based on the underlying assumption that land in Western Australia is predominantly undulating. The methodology specifies three bush fire hazard levels "Low", "Moderate" and "Extreme".

This methodology has been used in this Fire Management Plan.

The assessment of fire risk takes into account existing site conditions which include:

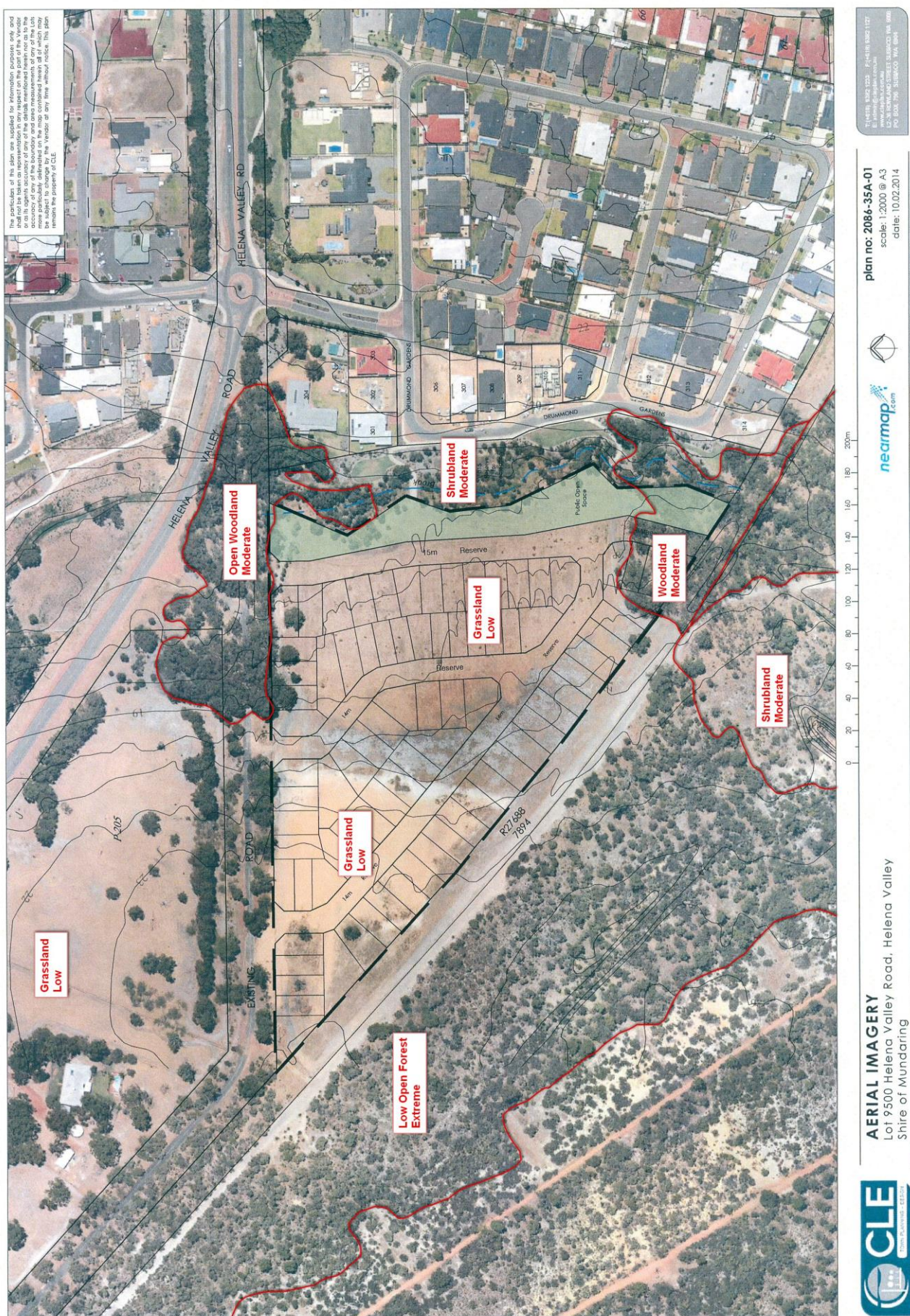
- Topography with particular reference to ground slopes and accessibility;
- Vegetation cover – both remnant and likely revegetation; and
- Relationship to surrounding development.

The Bush Fire Hazard for the site is based on the vegetation types for the site. (Refer to Figure 4)

- The Scrub is rated as "Moderate"
- The Woodland is rated as "Moderate"
- The Grassland is rated as "Low"
- Low Open Forest is rated as "Extreme"

Bushmead Rifle Range-(located in the City of Swan) and outside the "Site" is Low Open Forest is rated as "Extreme"

Figure 5 Bush Fire Hazard Assessment



5.4 BUSH FIRE THREAT

The site is identified as one being areas exposed to a high level of threat and there is a likelihood of a fire originating on the development site and from the surrounding properties.

The main threat to this development will be from the Bushmead Conservation Zone although this will be reduced once part of the Bushmead site is developed into urban development.

The Fire Management Plan is structured to reduce threats to residents and fire fighters in the event of a bushfire within or near the site. It has been developed to incorporate fire management methods including:-

- Adhering to the Shire of Mundaring annual firebreak notice;
- Setbacks from retained vegetation within and adjoining the site;
- Setbacks to be managed as Building Protection Zones.
- Access to link into the proposed development of the Bushmead site.
- Reticulated water to all Lots and installation of Fire Hydrants along the internal road system.

5.5 SUMMARY OF BUSH FIRE POTENTIAL ISSUES

The potential bush fire issues that have been identified for the Site are:-

- The reluctance for fire mitigation measures and access within Public Open Space areas;
- Requirement for setbacks from retained vegetation to proposed buildings;
- Construction of Dwellings within 100 metres of retained vegetation to be constructed in accordance with current AS 3959.

6.0 FIRE MITIGATION

6.1 HAZARD MANAGEMENT

Hazard Management on the lots will be controlled by:-

- The road reserve adjoining the Kadina Brook and the Old Helena Valley road is to be maintained initially by the developer then by the Shire of Mundaring to the BPZ standards detailed in Section 7.2 in perpetuity.
- An area of 4 metres wide consisting of turf must be installed along the western edge of the Kadina Brook POS so as to achieve the required setback from the retained vegetation in the Kadina Brook reserve.
- Compliance with the annual Notice issued by the Shire of Mundaring under the Act. Under the Bush Fires Act, compliance with a Notice is a landowner/occupier responsibility.
- To achieve a BAL 29 a setback of 20 metres from the landscaped area in Kadina Brook is required.

6.2 BUSH FIRE RISK MANAGEMENT

6.2.1 Total Fire Ban Days

A Total Fire Ban is declared because of the extreme weather conditions or when fires are seriously stretching fire fighting resources. A Total Fire Ban is declared by Department of Fire and Emergency Services (DFES) following consultation with Local Governments.

When a Total Fire Ban is declared it prohibits the lighting of any fires in the open air and any activities that might start a fire.

The ban includes all open fires for the purpose of cooking or camping. It also includes incinerators, welding, grinding soldering and gas cutting.

The Department of Fire and Emergency Service and the Shire of Mundaring are to continue to educate the public on what a Total Fire Ban means and what actions the public need to take.

6.2.2 Public Education Program

The Shire of Mundaring is to continue to provide the community with advice on bush fire prevention and preparedness through brochures, newspaper articles (relevant information set out on their web site) and the requirement for compliance with any Firebreak Notice and/or Hazard Reduction Notice issued to any owner or occupier under the Bush Fires Act.

The Developer is to provide a copy of the current

- Shire of Mundaring Firebreak Notice;
- *The Homeowners Survival Manual* and *Prepare Act Survive* brochure; and
- This Fire Management Plan at the time of sale of a Lot.

It is essential that the Real Estate agent handling the sale of lots on behalf of the subdivider advises potential landowners that a Fire Management Plan exists and that the modification of vegetation and on going fuel reduction will be required within this subdivision.

Other Public Safety and Community information on Bush Fires is available on the Department of Fire and Emergency Services web site www.dfes.wa.gov.au and the Shire of Mundaring website www.mundaring.wa.gov.au

6.2.3 Public Open Space.

There will be a 4 metre wide strip of turf and/or a footpath will be installed by the developer to be maintained as part of the setback from the retained vegetation in the Kadina Brook reserve and proposed dwellings. This is required to achieve the 23 metre setback required to achieve a BAL 19 construction standard. This setback is made up of a 4metre setback from the front of the Lots, 15metre wide road reserve and 4 metre low fuel area along the western edge of Kadina Brook reserve.

6.2.4 Bushmead Rifle Range.

Currently Reserve 27688 vested in the City of Swan and is cleared. With the 4 metre setback at the rear of adjoining Lots, the 20 metre wide reserve and the 4 metre wide firebreak in the Bushmead Rifle Range site a total setback of 28 metres is achieved from the retained vegetation and proposed dwellings. This equates to the dwellings along the southern edge of the development being constructed to AS 3959-2009 BAL 29.

With the addition of a non-flammable fence along the southern boundary of the lots, a reduction in the BAL rating due to shielding from direct flame contact or radiant heat may apply. A bushfire consultant will need to determine this as part of the building permit application. The 28 metre setback allows for open swimming pool style fencing (to 1.8 m high) however if this was replaced with a colour bond 1.8 metre high fence the BAL 29 would be reduced to BAL 19.

Alternatively if the setback was 31 metres or more then the BAL would be reduced to BAL 19.

6.2.5 Old Helena Valley Road.

The vegetation along the Old Helena Valley Road is mainly trees with some patches of shrub /scrub under the trees but ground cover is mainly grassland. As the road reserve is to be managed to the Building Protection Zone standards the developer is to thin out some of the smaller trees and remove dead wood within any trees and on the ground and to prune the lower branches of retained trees up to 2 metres high. This will allow the grass to be mowed to a maximum height of 50 mm during the October to May bush fire period. The road reserve is to be maintained to this standard by the Shire of Mundaring in perpetuity.

The landowner is to maintain the verge adjoining their lot to the Building Protection Zone Standard. The Shire of Mundaring is to maintain the northern verge and all verges if the landowner is not carrying out the maintenance.

6.3 FUTURE DEVELOPMENT

This Fire Management Plan has been prepared on the basis of the site being subdivided in accordance with the plan layout detailed in Figure 2. Any future proposed subdivision or development that results in a variation to this subdivision plan and would impact on the Bush Fire Risk Management will require approval from Western Australian Planning Commission and/or Local Government and may result in the need to review the provisions of this Fire Management Plan.

6.4 ACCESS AND FIREBREAKS

6.4.1 Road System

Access into the site will be via three entrances/exits off Old Helena Valley Road. A Link from the proposed road along the western boundary of Kadina Brook POS to link in with the road system within the development in the Bushmead Rifle Range to the south (located in the City of Swan) of the site providing two points of access/egress and complies with acceptable solution A2.1 and constructed to acceptable solution A2.2. Further subdivision of the adjoining Lots to the north and northeast of the site into residential areas may occur and this will provide additional access to Helena Valley Road. A road separates the Public Open Space and the residential area. All internal roads will comply with acceptable solution A2.2.

6.4.2 Firebreak Notice

Notwithstanding the provisions of this Fire Management Plan, all lots within the site must comply with the requirements of any Notice issued by the Shire of Mundaring, and as published in the Government Gazette annually, under the provisions of the Act (s.33). Complies with Acceptable Solution A 2.9

6.4.3 Fire Service access Across Kadina Brook

There is a requirement for fire service access across Kadina Brook at a location agreed to by the Shire of Mundaring. This access is to be installed by the Developer and maintained by the Shire of Mundaring. Fire Service access is to comply with acceptable solution A2.7.

The cost of construction and the approval process for a new crossing may prove difficult. There is an existing crossing within the Bushmead Rifle range area that with some maintenance to bring it up to the required standard may well be a satisfactory solution for both pieces of land. The alternative crossing which is proposed in lieu of a new crossing is shown on the map below and the accompanying photos.

Figure 6 Alternative Location of a Kadina Brook Crossing



**Photograph 1****Photograph 2**

The access shown in Figure 6 would need to be brought up to the fire service access way standard.

There is a development proposal for the Bushmead Rifle Range area in which the existing crossing is located, coordination between the two development sites will be required to implement this proposed crossing

6.4.4 Driveways.

Driveways within each residential Lot and will comply with the Shire of Mundaring standards.

6.5 FIRE SAFER AREAS

In the event of a bush fire, the Incident Controller of Fire Fighting Operations will advise if an evacuation is necessary and, in conjunction with the Shire of Mundaring Emergency Services, direct residents to Safer Refuge Areas.

6.6 ASSESSMENT OF FIRE MANAGEMENT STRATEGIES

All the actions and recommendations in this Fire Management Plan meet the requirements of the Bush Fires Act and the Planning for Bush Fire Protection Guidelines and are sound, measurable and practical having been used and proven over time. These recommendations take into account the various costs, alternatives available, benefits for protection of residents and the wider community, the environment and biodiversity protection.

This Fire Management Plan will be implemented as condition of subdivision for the site.

It will be the responsibility of the subdivider to implement the provisions of this Fire Management Plan (detailed in Section 6.7.2) in order to seek clearance of those conditions of subdivision.

Likewise it is the responsibility of the Shire of Mundaring to ensure that all standards required in this Fire Management Plan are met by the subdivider prior to the City recommending to the WA Planning Commission clearing any conditions of subdivision relating to this Fire Management Plan.

After any major fires that may occur during or once the subdivision of the Site has been completed, the Shire of Mundaring may conduct a Post Incident Analysis of the fire, which may include identifying and implementing any changes that may be needed to improve the performance of fire prevention strategies.

6.7 IMPLEMENTATION OF THE FIRE MANAGEMENT PLAN.

This Fire Management Plan becomes operational as a condition of subdivision.

In implementing this Fire Management Plan, the following responsibilities have been determined.

6.7.1 Property Owner's Responsibilities

To maintain the reduced level of risk and threat of fire, the owners/occupiers of all lots created by this proposal will be responsible for undertaking, complying and implementing measures protecting their own assets from the threat and risk of bush fire:

- Maintaining the property in good order to minimize potential bushfire fuels to mitigate the risk of fire on the property;
- Ensuring that the lot complies with any Firebreak Notice issued by the Shire of Mundaring. To be carried out annually;
- Private driveways are to be installed by the landowner to the requirements and standards of the Shire of Mundaring;
- Maintaining Building Protection Zones at the rear of the dwelling within their Lot that interfaces with the Bushmead Development (southern boundary of the site) along the western boundary of the Public Open Space and Lots along Old Helena Valley Road;
- Complying with the Section 70A notification placed on the Certificate of Title for each Lot advising that a Fire Management Plan has been prepared for each lot. Refer to Section 7.2;
- Complying with the instructions of DFES Fire Services, the Shire of Mundaring and/or volunteer fire services as may be issued under the Act for the purposes of maintaining the property or during the event of a bushfire;
- Ensuring that in the event an evaporative air conditioner is installed at the property, suitable external ember screens are installed to roof mounted units and that they comply with AS 3959, and that the screens are checked annually

6.7.2 Subdivider's Responsibilities

As a condition of subdivision the subdivider shall be required to carry out works described in Section 6 of this Fire Management Plan to the satisfaction of the Shire of Mundaring and the Western Australian Planning Commission:

- Install internal road system, Firebreaks and Fire service access across Kadina Brook as detailed in Section 6.4 to the specification detailed in Section 7.2;
- The Shire of Mundaring is to negotiate with the City of Swan a suitable site for the future access link into the Bushmead Site as detailed in Section 6.2.
- Thin out the trees along the Old Helena Valley Road as detailed in Section 6.2
- Each lot is to comply with any Notice issued by the Shire of Mundaring under the Act and as gazetted/issued annually. Firebreaks are to be maintained by the subdivider for each lot until each lot is sold;

- Install fire hydrants and road/pole markings in accordance with *Water Corporation No. 63 Water Reticulation standard*.
- Supply a copy of this Fire Management Plan and *The Homeowners Bush Fire Survival Manual, Prepare Act Survive (or similar suitable documentation)* and the annual Firebreak Notice issued by the Shire of Mundaring to each affected property purchaser requiring an increased building construction standard upon sale of the lot;
- Place a Section 70A notification on the Certificate of Title to each lot, advising landowners of the existence of this Fire Management Plan.

6.7.3 Shire of Mundaring

The responsibility for compliance with the law rests with individual property owners and occupiers and the following conditions are not intended to unnecessarily transfer these responsibilities to the Shire of Mundaring.

The Shire of Mundaring shall be responsible for:

- Maintain low fuel areas compliant with BPZ standards in the Road along and within the western boundary of the Public Open Space area and the Old Helena Valley road reserve;
- Enforcing any Notice issued by the Shire of Mundaring under the Act;
- Maintain the Public Open Space – Kadina Brook so as not to increase the bush fire risk to adjoining properties.;
- Providing fire prevention and preparedness advice to landowners upon request; and
- Ensuring compliance with this Fire Management Plan prior to clearance of conditions of subdivision.

6.7.4 City of Swan

Maintain reserve 27688 to the Building Protection Zone standard as detailed in Section 7.2.

7.0 APPENDICES

7.1 WORKS PROGRAM

The works detailed in Section 6.7.2 in this Fire Management Plan must be implemented by the subdivider as a condition of subdivision approval.

Landowners will be responsible for the annual maintenance required in any Notice issued by the Shire of Mundaring under the Act, the carrying out of any annual works associated with maintaining private driveways, Gates, BPZ's and HSZ's as detailed in this Fire Management Plan.

Prior to issue of Titles and Ongoing Maintenance

Activity	Responsibility	Maintenance	Responsibility
Installation of access, roads Standards Section 7.2	Developer	Checking of quality of Roads	Shire of Mundaring
Negotiate with the City of Swan the position of the access link into the future Bushmead development.	Developer	Shire of Mundaring to ensure this is completed and maintain portion with the Shire of Mundaring,	Shire of Mundaring
Implement fire protection measures as detailed in Sections 6.6.2	Developer	Annually maintenance required until Lots sold.	Developer
Compliance with Firebreak Notice. Details Section 6.4.	Initially Developer	Compliance with Firebreak Notice annually	Landowner
Installation of Fire Hydrants, pole and rod markings to Water Corporation Standards	Developer	Water Corporation Standards	Water Corporation
All residential Lots to be cleared of all vegetation	Developer	Annually Maintain front portions of Lots interfacing with retained vegetation BPZ until Lot is sold.	Initially Developer then landowner
Install Landscaping and fire service access in POS prior to the land release of Lots adjoin the POS	Developer	Annual maintenance to POS.	Shire of Mundaring
Section 70 A notification on Title of each Lot advising FMP applies to each Lot	Developer	Maintain Lot in accordance with Landowners responsibilities	Landowner
Provide a copy of following a sale of Lot:- Fire Management Plan Home Owners Survival Manual Prepare Act Survive Fire Control Notice	Developer	Landowners to familiarise themselves and annually update actions in the event of fire and annual maintenance of the above	Landowner

7.2 GUIDELINES SPECIFICATIONS AND MINIMUM STANDARDS

The following section outlines the required specifications and minimum development standards that are required under this Fire Management Plan.

7.2.1 Public Roads A2.2 – Internal Roads

Public roads meet the following requirements:

- minimum trafficable surface: 6 metres
- horizontal clearance: 6 metres
- vertical clearance: 4 metres
- maximum grades: 1 in 8
- maximum grade over <50 metres: 1 in 5
- maximum average grade: 1 in 7
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres

7.2.2 Fire Service Access A2.7– Across Kadina Brook

Fire services access routes, providing links between public road networks for fire fighting purposes, meet the following requirements:

- surface: all weather
- dead end: not permitted
- minimum trafficable surface: 6 metres
- horizontal clearance: 6 metres
- vertical clearance: 4 metres
- maximum grades: 1 in 7
- maximum grade over <50 metres: 1 in 4
- maximum average grade: 1 in 5
- minimum weight capacity: 15 tonnes
- maximum crossfall: 1 in 33
- curves minimum inner radius: 12 metres
- turn around areas designed to accommodate 3.4 appliances and to enable them to turn around safely: every 500 metres
- erosion control measures and long term maintenance arrangements in place
- access to public road network: every 1000 metres
- allow for two way traffic.

7.2.3 Building Protection Zone (BPZ)

The aim of the Building Protection Zones (BPZ) is to reduce bush fire intensity close to buildings, and to minimise the likelihood of flame contact with buildings.

The Building Protection Zone is a low fuel area immediately surrounding a building complying with Acceptable Solution A4.3 of the Guidelines.

A Building Protection Zone is to apply around all dwellings as detailed in Table 3 or to the Lot boundary and must fulfil the following conditions:

- Old Helena Valley road reserve and the road reserve along the western boundary of the Public Open space, 4 metres within the POS and the front of the Lots adjoining those roads and Bushmead Rifle Range will be managed as a Building Protection Zone.
- Loose flammable material within the BPZ should be removed to reduce the fuel load to less than 2 tonnes per hectare and this is to be maintained to this level.
- All dry grasses within the BPZ are to be maintained to a height of a maximum 50mm.
- The crowns of trees within the BPZ should be separated where practical such that there is a clear separation distance between adjoining tree crowns.
- Prune lower branches of trees within the BPZ (up to 2 metres off the ground) to stop a surface fire spreading to the canopy of the trees.
- There are to be no tree crowns or branches overhanging the building or asset and a minimum horizontal clearance of 2 metres is required between tree branches and buildings or assets.
- Do not clump shrubs close to building. Ensure that there is a gap of at least 3 times the height (at maturity) of the shrub away from the building.
- Trees or shrubs in the BPZ are to be cleared of any dead material.
- Fences, sheds and structures within the BPZ should be constructed of non-flammable material and be clear of trees and shrubs as per building requirements.
- Gas Cylinders should be isolated from the Flame Zone and should be stored in an area that is clear of all flammable material. Gas vent valves should face away from the building and anything flammable. Gas cylinders should be securely tethered with non-flammable fastenings to prevent toppling over.
- Fire wood storage should be at least 20 metres from the building unless contained in sealed non-flammable container.
- Driveways and access ways must allow for the safe passage of a fire appliance 2.4 to all buildings and assets on the land.
- Roof gutters should be free of leaves and other combustible material.
- Roof mounted evaporative air coolers should be fitted with ember proof screens to the filter media to reduce the possibility of bushfire embers igniting the air cooler.

It is further recommended that property owners, where possible and practical, further extend the width of the defendable space around assets by reducing fuel loads and fire hazards.

NOTE:

- The purpose of the BPZ is to reduce flammable fuel in the immediate vicinity of structures and other assets to reduce the bushfire attack level in accord with Australian Standard AS3959 section 2.

- The requirements for BPZ within Western Australia for new buildings are specified in the Guidelines.
- Maintained gardens are not classed as flammable for the defensible space.
- Areas such as pathways, drives, lawn, vegetable gardens, pools etc. all serve to reduce fire intensity and will form an integral part of any BPZ. The effectiveness of these in reducing the risk of fire damage to a building is enhanced if these areas are close to the building.

7.2.3 Building Construction

Individual dwellings on all lots shall be designed and built to conform with:

- The Building Code of Australia; and
- AS 3959 *Construction of Buildings in a Bushfire Prone Area*;

The minimum distance of 100 metres (from vegetation rated 'Moderate' or 'Extreme') may be reduced in compliance with AS 3959. Under AS 3959 as the distance from the vegetation is reduced, the construction standard must be increased. Table 2.4.3 AS 3959 sets out this relationship and Section 2 of AS 3959 details the methodology of determining the Bushfire Attack Level (BAL).

Where vegetation of any type is greater than 100 metres from a proposed dwelling the Bush Fire Attack Level (AS 3959 Section 2.2.23.2 Exclusions) shall be classified as BAL – Low. A lot with a BAL-Low classification means that there is insufficient risk to warrant specific construction standards (AS 3959 Table 3.1)

BAL (Bushfire Attack Level) Determination Using Methodology from Section 2.2.1 of current adopted AS 3959- 2009 and Table 2.4.3 which applies to the proposed Lots:

Table 2 Summary of Determination of BAL using Fire Danger Index 80

Vegetation Class	Setback from Vegetation (meters)	Slope	BAL	Construction Standard AS 3959-2009	BPZ (metres)
Open Forest Class A	21-31	Upslope	29	S 3 & 6	All Lots interfacing Bushmead Rifle Range
Woodland Class B	20-29	0°-5°	19	S.3 & 5	All Lots interfacing the POS and Old Helena Valley Road.

With the addition of a non-flammable fence along the southern boundary of the lots (interfacing with the Bushmead Rifle Range), a reduction in the BAL rating due to shielding from direct flame contact or radiant heat may apply. The 28 metre setback allows for open swimming pool style fencing (to 1.8 m high) however if this was replaced with a colour bond 1.8 metre high fence the BAL 29 would be reduced to BAL 19.

Alternatively if the setback was 31 metres or more then the BAL would be reduced to BAL 19.

All dwellings within 100 metres of retained vegetation will be required to constructed in accordance with the current version of AS 3959. A map providing the individual BAL ratings for Lots affected will be provided to the Shire of Mundaring as part of a DAP. This map will also be provided to the Real Estate agent who will make prospective landowners aware of the BAL ratings for Lots within the Estate.

A fire consultant on behalf of the landowner may carry out a new BAL assessment to confirm or determine a new BAL rating for a dwelling within 100 metres of retained vegetation. This assessment report is to be provided to the Shire of Mundaring as part of the Building Permit Application.

As a result of ember attack evaporative air conditioners can be the cause of a fire starting in a building. It is a requirement that the roof unit of an evaporative air conditioner is enclosed in a suitable external ember protection screen. More information is available at www.dfes.wa.gov.au and in AS 3959.

7.3 GLOSSARY

Acceptable Solution

A statement describing an acceptable means of complying with the requirements of corresponding performance criteria.

Appliance or Fire Appliance

A fire fighting appliance (vehicle) with structural, grass and bush fire fighting capabilities, with either a 2000 litres water capacity (2.4 appliance) or a 3000 litre water capacity (3.4 appliance) and four (4) wheel drive.

BAL – (abb) Bushfire Attack Level.

Bushfire Attack Level – an assessed rating of a site's risk to a bushfire, based on vegetation type, slope of the land and its proximity to buildings.

Building Construction Standard Buffer - An area 100 metres wide Including a Building Protection Zone in which an increase in building construction standard in accordance with AS3959 will apply.

Building Protection Zone (BPZ)

Low fuel area immediately surrounding buildings as described in Section 7.2.9. Minimum width 20 metres, increasing with slope. Created as part of the development of any habitable building on a lot and where necessary, extending to the lot boundary. Maintained by the landowner in perpetuity.

Bush

Under the Bush Fires Act 1954 the term bush is defined to include trees, bushes, plants, stubble, scrub and undergrowth of a kind whatsoever whether dead or alive and whether standing or not standing.

Bush Fire or Wildfire

A general term used to describe fire in vegetation that is not under control.

Bush Fire Hazard.

The flammability, arrangement and quantity of vegetation, dead or alive, that can be burnt in a bush fire. Development is to be avoided in extreme bush fire hazard designated areas, unless that hazard is reduced.

Bush fire prone area - for the purposes of this Fire Management Plan, a bush fire prone area is an area that has been declared as such by the relevant local government responsible for an area. Once an area is declared bush fire prone, then AS 3959 applies to new residential development within it.

Bush Fire Risk

The chance of a bush fire starting that will have harmful consequences on life and property. It is measured in terms of consequences and likelihood and arises from the interaction of hazards, communities and the environment.

DFES

Department of Fire and Emergency Service formally FESA

Development Application

An application for approval to carry out a development under either a local planning scheme or regional planning scheme.

Dwelling setback – the horizontal distance between a wall of the dwelling at any point, and an adjacent lot boundary, measured at right angles (90 degrees) to the boundary.

Emergency Access Way

Road not normally open but available to the public (using two wheel drive vehicles) for evacuation during a bush fire emergency.

Fire Break or Firebreak

Any natural or constructed discontinuity in a fuel bed not less than 3m wide and surrounding a lot or section of land used to segregate, stop and control the spread of a bush fire or to provide a fire line from which to suppress a bush fire and cleared to reduce the risk of bush fire damage.

FDI- Fire Danger Index

The chance of a fire starting, its rate of spread, its intensity and the difficulty of its suppression, according to various combinations of air temperature, relative humidity, wind speed and both the long and short- term drought effects.

Fire Protection

A generic term used to describe the range of services and systems used to mitigate the impact of fire on the community. It encompasses both fire prevention and emergency response.

Fire Management Plan

Ongoing, dynamic document that sets out the medium to long term mitigation strategies for fire hazards and risks in particular developments within local government areas.

Fire Services Access Route

Accessible by heavy four wheel drive fire fighting vehicles.

Fuel Reduction also Hazard Reduction

Removal and modification of bush fire fuel, or increase in building construction standards or a combination of the two.

Hazard Separation Zone (HSZ)

The fuel reduction area between an area bush fire hazard and the buildings (and associated building protection zones) of a development.

Low Fuel Area

An area of reduced bush fire fuels that is required to surround a Stage of land release and negates the need to increase the standard of dwelling construction on the edge of the Stage of land release. It complies with the Building Protection Zone standards is temporary until the next stage of land is cleared for release.

Performance Criteria.

Statement which specifies the outcomes required for the protection of life and property from bush fires.

Structural Fire

A fire in a building.

8.0 FIRE MANAGEMENT PLAN COMPLIANCE CHECKLIST FOR PERFORMANCE CRITERIA AND ACCEPTABLE SOLUTIONS

PROPERTY DETAILS: Lot 9500 Helena Valley Road, Helena Valley

Local Government: Shire of Mundaring

Element 1: Location

Does the proposal comply with the performance criteria by applying acceptable solution A1.1?

Yes

☒

No

☐

Increased building construction and appropriate BPZ & HSZ

Element 2: Vehicular Access

Does the proposal comply with the performance criteria by applying acceptable solution A2.1?

Yes

☒

No

☐

Does the proposal comply with performance criteria by applying acceptable solution A2.2?

Yes

☒

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A2.3?

Yes

☐

No

☐

Not applicable

Does the proposal comply with the performance criteria by applying acceptable solution A2.4?

Yes

☐

No

☐

To urban residential standard determined by the Shire of Mundaring

Does the proposal comply with the performance criteria by applying acceptable solution A2.5?

Yes

☐

No

☐

Not Applicable

Does the proposal comply with the performance criteria by applying acceptable solution A2.6?

Yes

☐

No

☐

Not Applicable

Does the proposal comply with the performance criteria by applying acceptable solution A2.7?

Yes

☒

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A2.8?

Yes

☐

No

☐

Not Applicable

Does the proposal comply with the performance criteria by applying acceptable solution A2.9?

Yes

☒

No

☐

Complying with Shire of Mundaring Firebreak Control Notice.

Does the proposal comply with the performance criteria by applying acceptable solution A2.10?

Yes

☐

No

☐

Not Applicable

Element 3: Water

Does the proposal comply with the performance criteria by applying acceptable solution A3.1?

Yes

☒

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A3.2?

Not Applicable

Yes

☐

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A3.3?

Not Applicable

Yes

☐

No

☐

Element 4: Siting of Development

Does the proposal comply with the performance criteria by applying acceptable solution A4.1?

Not Applicable

Yes

☒

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A4.2?

Yes

☐

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A4.3?

Old Helena Valley road along western boundary of POS & adjoining Bushmead Rifle Range.

Yes

☒

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A4.4?

Not Applicable

Yes

☐

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A4.5?

Not Applicable

Yes

☐

No

☐

Element 5: Design of Development

Does the proposal comply with the performance criteria by applying acceptable solution A5.1?

The development uses acceptable solutions as appropriate to meet the requirements under performance criterion P5.

Yes

☒

No

☐

Does the proposal comply with the performance criteria by applying acceptable solution A5.2?

Not Applicable

Yes

☐

No

☐

Applicant Declaration:

I declare that the information provided is true and correct to the best of my knowledge.

Name of Person Preparing the Fire Management Plan:

Full Name: *B.W. Harris* for FirePlan WA

Date: 08/08/2013

Developer:

Full Name: _____ Signature: _____ Date: _____