

Figure 3.1.1

### Classified Vegetation & Topography (Post Dev)

Lot 500 on Plan 057971, Area : 15.2ha  
32 Gavour Road  
WATTLE GROVE  
CITY OF KALAMUNDA



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

- Subject Site
- Cadastral
- Hydrants
- Elevation (2m)
- APZ Distance (m)
- APZ
- 100m Assessment Area
- 150m Assessment Area
- Proposed Lots

**Proposed Buildings**

- Admin
- Meeting Place
- Res. Workshop
- VCMT
- Clubhouse
- Wellness Retreat
- Community Facilities

**Classified Vegetation**

- Forest
- Woodland
- Grassland
- Excluded 2,2,3,2 (f)

0 50 100 150 200

Metres

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

**AERIAL IMAGERY:** Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50  
Projection: Universal Transverse Mercator Units: Metre  
Map by: Selina Hutcheon 16-07-2025  
SCALE (A3): 1 : 3000

**BUSHFIRE PRONE PLANNING**

210994\_Fig3-1-1\_POSTVEG -32 Gavour Road Wattle Grove.qgz

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence which may arise from relying on any information depicted.

Figure 3.2  
**BAL Contour Map**

Lot 500 on Plan 057971, Area : 15.2ha  
32 Gavour Road  
WATTLE GROVE  
CITY OF KALAMUNDA

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

- Subject Site
- Cadastral
- Hydrants
- Elevation (2m)
- 100m Assessment Area
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**Proposed Buildings**

- Admin
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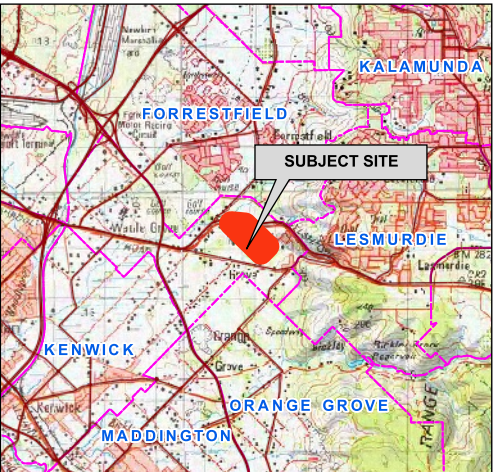
**Bushfire Attack Levels**

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

0 50 100 150 200

Metres

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



AERIAL IMAGERY: Landgate/SLIP



Coordinate System: GDA 1994 MGA Zone 50  
Projection: Universal Transverse Mercator Units: Metre  
Map by: Selina Hutcheon 16-07-2025  
SCALE (A3): 1 : 3000

## 4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

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This section is not required for a development application.

## 5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA (BPC)

### EXPLANATORY INFORMATION

The bushfire protection criteria (BPC) consist of five elements each focussed on a primary set of bushfire protection measures considered by the Department of Planning, Lands and Heritage / the Western Australian Planning Commission, as the most important to be considered in land use planning.

*[Note: the additional primary bushfire protection measure of bushfire construction requirements that are to apply to certain classes of habitable buildings in WA (corresponding to their assessed Bushfire Attack Level) - is implemented through the process of applying the Building Code of Australia (Volumes 1 and 2 of the National Construction Code) in accordance with WA building legislation – not through any planning legislation].*

The elements of the BPC are Location (applicable to strategic and structure plan/subdivision planning stages), and Siting and Design, Vehicular Access and Water Supply (applicable to all planning stages and land uses).

The BPC establish a set of acceptable solutions that are considered a 'deemed to comply' pathway to satisfying intent, objectives and outcomes of State Planning Policy 3.7 Bushfire (SPP 3.7).

When all applicable acceptable solutions cannot be met, the use of the alternative pathway of an outcomes-based approach is available. In brief, this involves the development of a merit based case, specific to the planning proposal, that potentially involves the use of innovative, alternative and or additional bushfire protection measures and addressing the level of risks associated with a bushfire event. This is then presented to the decision-maker for their discretionary decision.

The requirement to prepare a Bushfire Emergency Plan (BEP) for vulnerable land uses is an additional bushfire protection measure established by SPP 3.7. This is to be produced as a separate standalone operational document. However, some requirements identified in the BEP may necessarily incorporated into this BMP and the responsibilities it creates.

### 5.1 Local Government Variations to Apply

#### EXPLANATORY INFORMATION

1. Local governments may add to or modify the acceptable solutions contained within the Guidelines, through regional or local variations that form part of a local planning strategy and/or local planning scheme to recognise special local or regional circumstances that reinforce the SPP 3.7 objectives and outcomes (via a scheme amendment or special control area).

This could include acceptable solutions that address topography, vegetation or climate to the satisfaction of the Western Australian Planning Commission (WAPC) that the modifications comply with the corresponding SPP 3.7 objectives and outcomes. (Planning for Bushfire Guidelines, s. 3.4, 2024).

2. Under the relevant state legislation (LPS Regulations 2015), SPP 3.7 does not apply to hosted or unhosted short-term rental accommodation. However, the local government under its Local Planning framework (i.e. Strategy / Scheme and Policy as applicable), may require that certain bushfire protection measures or variations to the measures (the bushfire protection criteria), established by SPP 3.7 and the Guidelines, are to be applied.

Endorsed regional or local variations to the acceptable solutions apply to the assessments against the Bushfire Protection Criteria for the planning proposal?

None known or identified

The proposed land use for hosted or unhosted short-term rental accommodation, and the local government requires certain bushfire protection measures, contained within the BPC, to be applied, that under the LPS Regulations 2015, would otherwise not be required?

N/A

## 5.2 Assessment Summary

| HOW THE REQUIRED BUSHFIRE PLANNING OUTCOMES OF SPP 3.7 ARE ACHIEVED FOR THE PLANNING PROPOSAL           |                                                                                 |                                                                                    |
|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| DEVELOPMENT - RESIDENTIAL                                                                               |                                                                                 |                                                                                    |
| The Bushfire Protection Criteria (BPC)<br>Elements and Acceptable Solutions                             | Compliance Pathway Applied and Assessment Outcome                               |                                                                                    |
|                                                                                                         | Deemed to Comply                                                                | Outcomes-Based Approach                                                            |
|                                                                                                         | Achieved by Complying with<br>All Applicable Acceptable<br>Solutions of the BPC | Case Presented for<br>Alternative Solutions to<br>Achieve the Required<br>Outcomes |
| E2: SITING AND DESIGN                                                                                   | Fully Compliant                                                                 | N/A                                                                                |
| A2.1a Siting and design                                                                                 | Fully Compliant                                                                 | N/A                                                                                |
| OR                                                                                                      |                                                                                 |                                                                                    |
| A2.1b Siting in an area with a radiant heat impact<br>exceeding 29 kW/m <sup>2</sup> (BAL-40 or BAL-FZ) | Not Applicable                                                                  | N/A                                                                                |
| A2.2 Asset Protection Zone (APZ)                                                                        | Fully Compliant                                                                 | N/A                                                                                |
| A2.3 Clearing of native vegetation                                                                      | Fully Compliant                                                                 | N/A                                                                                |
| E3: VEHICULAR ACCESS                                                                                    | Fully Compliant                                                                 | N/A                                                                                |
| A3.1 Private Driveways                                                                                  | Fully Compliant                                                                 | N/A                                                                                |
| E4: WATER SUPPLY                                                                                        | Fully Compliant                                                                 | N/A                                                                                |
| A4.1 Water supply                                                                                       | Fully Compliant                                                                 | N/A                                                                                |

## 5.3 Development – Residential – BPC 6 Assessment Statements

### 5.3.1 Element 2: Siting and Design

| ELEMENT 2: SITING AND DESIGN (DEVELOPMENT - RESIDENTIAL)                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All details of acceptable solution requirements are established in the Planning for Bushfire Guidelines (Guidelines) – WA Department of Planning, Lands and Heritage (DPLH, as amended). When relevant, the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (DPLH, 2021 Rev B), is also referenced. |                                                                                                                                                                                                                                                                                |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| O2                                                                                                                                                                                                                                                                                                                | State Planning Policy 3.7 Bushfire - Outcomes to be Achieved                                                                                                                                                                                                                   |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                   | <b>SPP 3.7, 6.2: Ensure siting and design solutions:</b> <ul style="list-style-type: none"> <li>Manage or mitigate the bushfire risk to people, property and infrastructure; and</li> <li>Avoid, or where unavoidable, minimises the clearing of native vegetation.</li> </ul> |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| E2                                                                                                                                                                                                                                                                                                                | Statement for Compliance with Element E1 – The Deemed to Comply Pathway                                                                                                                                                                                                        |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                   | The planning proposal is fully compliant with all applicable acceptable solutions and therefore achieves the required outcomes of this element.                                                                                                                                |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                   | Alternative Pathway Applied to Achieve SPP 3.7 Outcomes                                                                                                                                                                                                                        |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                   | N/A                                                                                                                                                                                                                                                                            |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| ACCEPTABLE SOLUTIONS - ASSESSMENT STATEMENTS                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Check Box Legend: <input checked="" type="checkbox"/> Relevant & met <input checked="" type="checkbox"/> Relevant & not met <input type="checkbox"/> Not relevant                                                                                                                                                 |                                                                                                                                                                                                                                                                                |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>A2.1a Siting and design</b>                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                | Applicable:              | <div>Yes</div> <div>Compliant:</div> <div>Yes</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                               | <input type="checkbox"/>                                                                                                                                                                                                                                                       | <input type="checkbox"/> | The residential habitable building achieves a radiant heat impact not exceeding 29 kW/m <sup>2</sup> (BAL-29).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <u>Assessment Supporting Details:</u><br>All proposed habitable buildings are proposed within BAL-29 or below. Lot 28 and 29 include a small portion of BAL-40 which will not be constructed upon, refer to the dwelling design in Figure 1.1.                                                                    |                                                                                                                                                                                                                                                                                |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>A2.1b Siting in an area with a radiant heat impact exceeding 29 kW/m<sup>2</sup> (BAL-40 or BAL-FZ)</b>                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                | Applicable:              | <div>No</div> <div>Compliant:</div> <div>-</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <input type="checkbox"/>                                                                                                                                                                                                                                                                                          | <input type="checkbox"/>                                                                                                                                                                                                                                                       | <input type="checkbox"/> | The residential habitable building(s) is sited with a radiant heat impact exceeding 29 kW/m <sup>2</sup> (BAL-40 or BAL-FZ) i.e. unable to establish an APZ in accordance with A2.2. However, the existence of the following conditions to allow consideration for approval are satisfied: <ul style="list-style-type: none"> <li>The lot was created prior to 2015; and</li> <li>There are demonstrated site characteristics and/or biodiversity or conservation values that prevent the achievement of a radiant heat impact not exceeding 29 kW/m<sup>2</sup> (BAL-29); and</li> <li>It is demonstrated that the reduction of the building footprint or a redesign to manage or mitigate the risk, is not practical or appropriate.</li> </ul> AND<br>The vegetation immediately surrounding the building(s) can and will be managed as defensible space in accordance with Appendix B.2, Table 9 – APZ technical requirements. |

#### Assessment Supporting Details:

A2.1a is complied with, therefore A2.1b is not required.

#### A2.2 Asset Protection Zone (APZ)

Applicable:

Yes

Compliant:

Yes

#### EXPLANATORY INFORMATION

Refer to Appendix B1 for an explanation of what an APZ is and its purpose and the factors determining the dimensions of the 'Planning BAL-29' APZ, the 'BAL Rating' APZ, the 'Local Government' APZ and the 'Required' APZ which is to be established and maintained by the eventual landowner.

The following assessment of the acceptable solution is applying the dimensions of the 'Planning BAL-29' APZ to provide evidence of the planning proposals ability, or not, to achieve the minimum vegetation separation distances considered acceptable by the planning authority.

The 'Planning BAL-29' APZ is not necessarily the size of the APZ that must be physically implemented and maintained by the eventual landowner surrounding a habitable building.

Where a residential habitable building(s) cannot be wholly within an area with a radiant heat impact not exceeding 29 kW/m<sup>2</sup> (BAL-29) in its pre-development state, an indicative APZ is to be provided and meet the following requirements for width, location and management:

- ☒ ☐ ☐ **APZ Width:** The APZ, when measured from any external wall or supporting post or column, is of sufficient size to ensure the radiant heat impact of a bushfire does not exceed 29 kW/m<sup>2</sup> (BAL-29) to any part of the building, in all circumstances.
- ☐ ☐ ☒ **APZ Location – Option 1:** The indicative 'Planning BAL-29' APZ can be contained solely within the boundaries of the lot.
- ☒ ☐ ☐ **APZ Location – Option 2:** The indicative 'Planning BAL-29' APZ cannot be contained solely within the boundaries of the lot. However, the relevant vegetation on the adjoining land / lot(s) is, and will continue to be, on an ongoing basis in perpetuity, low threat as per:
- Clause 2.2.3.2 of AS 3959 (including non-vegetated land such as a sealed or unsealed road, or a water body); or
  - The requirements of the Guidelines Appendix B.2, Table 9 – APZ technical requirements; or
  - The alternative standard in the local planning scheme (when it exists).
- ☐ ☐ ☒ **APZ Management:** The APZ can and will be managed in accordance with the requirements of Guidelines, Appendix B.2, Table 9 – APZ technical requirements, or the alternative standard in the gazetted local planning scheme (when it exists).

#### Assessment Supporting Details:

The proposal will manage a significant portion of the lot as part of the APZ (Figure 3.1.1.). Offsite low threat areas are also relied upon for BAL ratings including roads and managed backyards.

#### A2.3 Clearing of native vegetation

Applicable:

Yes

Compliant:

Yes

- ☐ ☐ ☒ The development avoids, or where unavoidable, minimises the clearing of native vegetation.

Assessment Supporting Details: Some native vegetation will be retained within the lot. The property is an existing residential lot with significant degradation already having occurred.

### 5.3.2 Element 3: Vehicular Access

| ELEMENT 3: VEHICULAR ACCESS (DEVELOPMENT - RESIDENTIAL)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                             |             |            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| <p>All details of acceptable solution requirements are established in the Planning for Bushfire Guidelines (Guidelines) – WA Department of Planning, Lands and Heritage (DPLH, as amended). When relevant, the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (DPLH, 2021 Rev B), is also referenced.</p> <p>The technical construction requirements for access types and components are established in the Guidelines Appendix B.3, Table 10 (certain information is copied and presented in Appendix C of this BMP). 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 appendix if requested by the local government.</p> |                                                                                                                                                                                                                                                                                                                                                                             |             |            |
| O3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | State Planning Policy 3.7 Bushfire - Outcomes to be Achieved                                                                                                                                                                                                                                                                                                                |             |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p><b>SPP 3.7, 6.3: Ensure the design and capacity of vehicular access and egress provide:</b></p> <ul style="list-style-type: none"> <li>For efficient and effective evacuation to a suitable destination(s) and/or</li> <li>As a contingency measure for vulnerable land uses, an on-site shelter, where demonstrated appropriate, as a last resort option.</li> </ul>    |             |            |
| E3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Statement for Compliance with Element E1 – The Deemed to Comply Pathway                                                                                                                                                                                                                                                                                                     |             |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | The planning proposal is fully compliant with all applicable acceptable solutions and therefore achieves the required outcomes of this element.                                                                                                                                                                                                                             |             |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Alternative Pathway Applied to Achieve SPP 3.7 Outcomes                                                                                                                                                                                                                                                                                                                     |             |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | N/A                                                                                                                                                                                                                                                                                                                                                                         |             |            |
| ACCEPTABLE SOLUTIONS - ASSESSMENT STATEMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                             |             |            |
| Check Box Legend: <input checked="" type="checkbox"/> Relevant & met <input checked="" type="checkbox"/> Relevant & not met <input type="checkbox"/> Not relevant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                             |             |            |
| <b>A3.1 Private driveways</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                             | Applicable: | Compliant: |
| <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | The subject lot is serviced by reticulated water and the private driveway is no greater than 70 metres in length between the most distant external part of the habitable building and the public road. For these conditions, no private driveway technical requirements are prescribed by the Guidelines. All the following established requirements do not need to be met. |             |            |
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | The private driveway meets the technical requirements (Guidelines Appendix B3, Table 10) for minimum horizontal clearance (6 metres) or where not required to comply with the Guidelines width, it meets the requirements of the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.                                                       |             |            |
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | The private driveway meets the technical requirements (Guidelines Appendix B3, Table 10) for minimum vertical clearance (4.5 metres), minimum weight capacity (15 tonnes - includes bridges, culverts) and minimum inner radius of road curves (8.5 metres).                                                                                                                |             |            |
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | The private driveway meets the technical requirements (Guidelines Appendix B3, Table 10) for the gradients of different surfaces and dips.                                                                                                                                                                                                                                  |             |            |

|                                                                                       |                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> | Passing bays can and will be installed every 200 metres with a minimum length of 20 metres and a minimum additional carriageway width of 2 metres i.e. the combined carriageway width of the passing bay and constructed private driveway will be a minimum 6 metres. |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                       |                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | The turnaround area / head requirements (Guidelines, Figure 30) can and will be complied with and will be located within 30 metres of the residential building (Guidelines Figure 38). |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Assessment Supporting Details:

The proposed internal accessways are to be constructed with a trafficable width of 6m, which exceeds the minimum requirements for width + passing bays. Small areas of the road network will be 4m in width and will be one-way roads. These sections are <200m in width and therefore still comply with the passing bay requirements.

All proposed lots and buildings meet the turnaround requirements; the internal road network is a through network providing access from Welshpool Rd East to Gavour Rd. Multiple turnaround options are located within the site including the loop design at the clubhouse, the loop designed roads, roundabouts, and parking areas.

Each proposed lot has a private driveway which will not be required to comply with technical requirements due to the short lengths.

### 5.3.3 Element 4: Water Supply

| ELEMENT 4: WATER SUPPLY (DEVELOPMENT - RESIDENTIAL)                                                                                                                                                                                                                                                               |                                                                                                                                                                            |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| All details of acceptable solution requirements are established in the Planning for Bushfire Guidelines (Guidelines) – WA Department of Planning, Lands and Heritage (DPLH, as amended). When relevant, the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (DPLH, 2021 Rev B), is also referenced. |                                                                                                                                                                            |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
| O4                                                                                                                                                                                                                                                                                                                | State Planning Policy 3.7 Bushfire - Outcomes to be Achieved                                                                                                               |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
|                                                                                                                                                                                                                                                                                                                   | SPP 3.7, 6.4: Ensure that sufficient water is available and accessible for emergency services, to enable people, property and infrastructure to be defended from bushfire. |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
| E4                                                                                                                                                                                                                                                                                                                | Statement for Compliance with Element E1 – The Deemed to Comply Pathway                                                                                                    |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
|                                                                                                                                                                                                                                                                                                                   | The planning proposal is fully compliant with all applicable acceptable solutions and therefore achieves the required outcomes of this element.                            |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
|                                                                                                                                                                                                                                                                                                                   | Alternative Pathway Applied to Achieve SPP 3.7 Outcomes                                                                                                                    |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
|                                                                                                                                                                                                                                                                                                                   | N/A                                                                                                                                                                        |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
| ACCEPTABLE SOLUTIONS - ASSESSMENT STATEMENTS                                                                                                                                                                                                                                                                      |                                                                                                                                                                            |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
| Check Box Legend: <input checked="" type="checkbox"/> Relevant & met <input checked="" type="checkbox"/> Relevant & not met <input type="checkbox"/> Not relevant                                                                                                                                                 |                                                                                                                                                                            |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |     |
| A4.1 Water supply                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                            | Applicable:              | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Compliant: | Yes |
| <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                               | <input type="checkbox"/>                                                                                                                                                   | <input type="checkbox"/> | Evidence is provided that a reticulated water supply, available for firefighting purposes, exists or can be provided. Hydrant connection(s) will be provided in accordance with the specifications established by the relevant water supply authority (refer also to hydrant location information in Appendix D of this BMP).                                                                                                                        |            |     |
| <input type="checkbox"/>                                                                                                                                                                                                                                                                                          | <input type="checkbox"/>                                                                                                                                                   | <input type="checkbox"/> | The subject site will have a reticulated water supply but is in an area designated as Area 2 on the Map of BPA and/or the local government area has known issues with water supply or pressure.<br>The proposed development will adopt the Guidelines recommendation to provide water supply tank(s) and fittings dedicated to firefighting purposes that satisfy the construction and design requirements established in Appendix B4: Water Supply. |            |     |
| <input type="checkbox"/>                                                                                                                                                                                                                                                                                          | <input type="checkbox"/>                                                                                                                                                   | <input type="checkbox"/> | The subject site is serviced by reticulated water. However, the distance from the public road (along which the fire hydrant is located) to the farthest part of the habitable building is greater than 70 metres, exceeding the reach of a hose reel.<br>A water supply tank will be installed within the lot in accordance with the relevant requirements of Guidelines, Appendix B4: Water Supply.                                                 |            |     |
| <input type="checkbox"/>                                                                                                                                                                                                                                                                                          | <input type="checkbox"/>                                                                                                                                                   | <input type="checkbox"/> | The provision of or the specifications of a reticulated water supply cannot be met. Evidence is provided that a sufficient, sustainable and accessible non-reticulated water supply, dedicated to firefighting purposes, can and will be provided in accordance with the specifications established in the Guidelines, Appendix B4: Water Supply.                                                                                                    |            |     |
| <input type="checkbox"/>                                                                                                                                                                                                                                                                                          | <input type="checkbox"/>                                                                                                                                                   | <input type="checkbox"/> | A 10,000 litre water supply tank per habitable building, dedicated to firefighting purposes, will be installed within each lot.                                                                                                                                                                                                                                                                                                                      |            |     |

- |                          |                          |                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|--------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>The above ground water supply tank(s), dedicated to firefighting purposes (and tank stand(s) when applicable), will be constructed of non-combustible material and as necessary, will comply with AS/NZS 3500.1 (as amended).</p> <p>This includes not using the same water supply for both domestic use and firefighting purposes. If a combined use tank(s) is to be used, it will separate the storage compartments in accordance with the provisions of the standard (i.e. internal installation of double partition walls).</p>                                       |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>The outlet connection fitting for the water supply tank(s), dedicated to firefighting purposes, will have a full flow valve and a 50 mm male camlock coupling.</p>                                                                                                                                                                                                                                                                                                                                                                                                         |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>All above-ground, exposed water supply pipes and fittings will be metal and positioned facing away from the source of bushfire hazard and/or shielded against potential bushfire impact – to allow access by emergency services.</p>                                                                                                                                                                                                                                                                                                                                       |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>The planned provision of the water supply tank(s) will consider locations relative to the bushfire hazard. Location of the tank(s) and management of vegetation will ensure vegetation will not exist over or against the tank(s) and that sufficient separation exists to limit the potential bushfire impact.</p> <p>Due consideration will also be given to the provision of sufficient separation from vegetation and/or shielding for the protection of firefighters accessing the water supply.</p>                                                                  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>An unobstructed, hardened ground surface, for emergency services vehicle access, can and will be installed within 4 metres of the water supply outlet (refer to Figure 39, Guidelines).</p>                                                                                                                                                                                                                                                                                                                                                                                |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>It is proposed for a water supply tank outlet(s) is to be remote from the tank, the local government and DFES will have been consulted regarding the application and location. The determined requirements are presented as an Addendum in this BMP.</p>                                                                                                                                                                                                                                                                                                                   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Planned below ground water supply tank(s), dedicated to firefighting purposes, will have at least a 200 mm diameter access hole – or a suitable inspection opening - to allow tankers or emergency services vehicles to refill direct from the tank, with the outlet location clearly marked on the surface. As necessary, the tanks(s) will comply with AS/NZS 3500.1 (as amended).</p>                                                                                                                                                                                   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>The subject site is in a non-reticulated area. The planning proposal adopts the recommendation contained in Guidelines, Appendix B4: Water supply, that where pumping equipment is installed it will be powered by means other than the electricity network such as an appropriately powered and capacity petrol/diesel or onsite generator/electricity, driven pump, and be shielded against potential bushfire impact.</p>                                                                                                                                               |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>The planning proposal intends that a suitable static water supply is to be provided by a dam or river that complies with the DFES guidelines for acceptable sources of water for firefighting purposes.</p> <p>Evidence is provided that:</p> <ul style="list-style-type: none"> <li>• Demonstrates that the water level will be maintained above the top of the highest fire brigade suction point; and</li> <li>• Approval has been obtained from the decision maker in consultation with the emergency services and is presented as an Addendum in this BMP.</li> </ul> |

#### Assessment Supporting Details:

The site is located in a reticulated area. Hydrants are to be installed along the internal roads.

[Refer to additional technical requirement information contained in Appendix D]

## 6 RESPONSIBILITY CHECKLISTS – IMPLEMENTATION AND ONGOING MANAGEMENT

### RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF BUSHFIRE PROTECTION MEASURES

The following sections and their associated tables establish:

- The bushfire protection measures that shall be initially implemented and those requiring ongoing maintenance to the stated requirements;
- The persons responsible for the implementation and maintenance of the required bushfire protection measures; and
- The persons responsible and the timing for compliance certification when required.

The necessity for the BMP to contain this information is established by the *Guidelines for Planning in Bushfire Prone Areas* (Version 1.4, WAPC 2021) in Appendices 3 and 5.

## 6.1 Checklists for Implementation of Bushfire Protection Measures

### 6.1.1 Developer Responsibilities Prior to Issue of Certificates of Title for New Lots

**TABLE 6.1(A)**  
**DEVELOPER RESPONSIBILITIES PRIOR TO OCCUPANCY**

| No. | Bushfire Protection Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Construct the internal roads to comply with the technical requirements stated and/or referenced in the BMP at Element 3: Vehicular access, A3.1 Public roads.                                                                                                                                                                                                                                                                                                                           |
| 2   | To facilitate the staging arrangements, install and construct the temporary access way identified in the BMP as an interim second access route until the required second access route is constructed as a public road in a subsequent stage.<br>The temporary emergency access way and associated signage and gates is to comply with the length restrictions and technical requirements stated and/or referenced in the BMP at Element 3: Vehicular access, A3.4 Emergency access way. |
| 3   | Install the reticulated firefighting water supply and hydrants to comply with the technical requirements stated and/or referenced in the BMP at Element 4: Water supply and Appendix D.                                                                                                                                                                                                                                                                                                 |
| 4   | Establish the planned communal green spaces. Ensure all retained and planned vegetation can be regarded as 'low threat' when considering the relevant parameters of extent, connectivity, flammability, moisture or fuel load.                                                                                                                                                                                                                                                          |
| 5   | Clearing and/or vegetation modification to be undertaken in accordance with requirements established by the BMP.<br>If native vegetation is required to be modified or removed, ensure that approval has been received from the relevant authority (refer to the applicable local government for advice).                                                                                                                                                                               |

## 6.1.2 Landowner Responsibilities Prior to Occupancy

| <b>TABLE 6.2(A)</b><br><b>REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS</b><br><b>(SUBJECT TO COMPLIANCE CHECK TO BE CONDUCTED BY A BUSHFIRE CONSULTANT)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                                                                                                                             | <p>Prior to occupancy establish the 'Required' Asset Protection Zone (APZ) around habitable buildings (and other structures as required) to satisfy:</p> <ul style="list-style-type: none"> <li>• The minimum required dimensions established in Appendix B1; and</li> <li>• The standards established by the <i>Guidelines for planning in bushfire prone areas</i>, DPLH, 2021 v1.4, Schedule 1; or</li> <li>• The standards established for an Asset Protection Zone (APZ) by the relevant local government's requirements set out in a section 33 notice under the Bush Fires Act 1954 (annual firebreak/fuel load notice); or</li> <li>• An alternative standard in a gazetted local planning scheme; or</li> <li>• A Landscape Management Plan.</li> </ul> <p>If native vegetation is required to be modified or removed, ensure that approval has been received from the relevant authority (refer to the applicable local government for advice).</p> |
| 2                                                                                                                                                                             | <p>To facilitate the staging arrangements, ongoing management of vegetation to a minimal fuel, condition and presenting a low threat, is required on land that is part of a subsequent stage.</p> <p>Prior to occupancy, and until the subsequent stage is developed, the required vegetation removal and/or modification identified in the BMP must be carried out.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 3                                                                                                                                                                             | <p>Prior to occupancy, for the 'vulnerable' land use, there is an outstanding obligation, created by this Bushfire Management Plan, for a Bushfire Emergency Plan for proposed occupants to be developed and approved.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4                                                                                                                                                                             | <p>Prior to occupancy, signage must be prominently displayed within the site that informs the actions of those persons onsite in the event of a bushfire. This will include evacuation route information, site procedures – as per the instructions within the Bushfire Emergency Plan developed for the site and use. This includes providing occupants with a copy of the Bushfire Emergency Information Poster and assembly area signage.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 5                                                                                                                                                                             | <p>Prior to occupancy, all actions contained within the 'Pre-Season Preparation Procedure' established by the Bushfire Emergency Plan, must be completed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**TABLE 6.2(B)**  
**REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS**  
**(NOT SUBJECT TO COMPLIANCE CHECK)**

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <p>Prior to relevant building work, inform the builder 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.</p> <p>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 these construction requirements when established by the relevant authority or if identified as an additional bushfire protection measure within the BMP.</p> <p>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).</p> |
| 2 | <p>Each occupant is provided with a copy of the BMP and informed of their responsibilities.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 3 | <p>Prior to occupancy, a copy of the Bushfire Emergency Plan (BEP) must be provided to occupants, and they are to be informed that it contains responsibilities that must be actioned due to the use of the land being defined as a 'Vulnerable Land Use' for the reasons identified in Section 1.1.</p> <p>The 'Pre-Season Preparation Procedure' instructions must be complied with.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### 6.1.3 Landowner Responsibilities – Ongoing Management

| <b>TABLE 6.3</b><br><b>REQUIRED BUSHFIRE PROTECTION MEASURES – ONGOING MANAGEMENT ACTIONS</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                                                             | <p>Maintain the 'Required' Asset Protection Zone (APZ) around habitable buildings (and other structures as required) to satisfy:</p> <ul style="list-style-type: none"> <li>• The minimum required dimensions established in Appendix B1; and</li> <li>• The standards established by the <i>Guidelines for planning in bushfire prone areas</i>, DPLH, 2021 v1.4, Schedule 1; or</li> <li>• The standards established for an Asset Protection Zone (APZ) by the relevant local government's requirements set out in a section 33 notice under the Bush Fires Act 1954 (annual firebreak/fuel load notice); or</li> <li>• An alternative standard in a gazetted local planning scheme; or</li> <li>• A Landscape Management Plan.</li> </ul> |
| 2                                                                                             | Maintain any areas nominated to be revegetated in accordance with the vegetation classification and management standards as specified in the BMP and/or Landscape Management Plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3                                                                                             | Comply with the City of Kalamunda Fire Hazard Reduction Notice issued under s33 of the Bush Fires Act 1954. Check the notice annually for any changes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4                                                                                             | Maintain vehicular access routes within the facility to comply with the technical requirements referenced in the BMP and the relevant local government's annual firebreak / hazard reduction notice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5                                                                                             | Ensure all future buildings 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).                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 6                                                                                             | Annually review the Bushfire Emergency Plan and complete all actions contained within the 'Pre-Season Preparation Procedure' and the 'In-Season Preparation Procedure' at the appropriate times of the year.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 7                                                                                             | Ensure the ongoing implementation of the BMP, including providing successive management with a copy of the BMP and making them aware of the responsibilities it contains.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## APPENDIX A: DETAILED BAL ASSESSMENT DATA AND SUPPORTING INFORMATION

### A1: BAL Assessment Inputs Common to the Method 1 and Method 2 Procedures

#### A1.1: FIRE DANGER INDICES (FDI/FDI/GFDI)

When using Method 1 the relevant FDI value required to be applied for each state and region is established by AS 3959:2018, Table 2.1. Each FDI value applied in Tables 2.4 – 2.7 represents both the Forest Fire Danger Index (FFDI) and a deemed equivalent for the Grassland Fire Danger Index (GFDI), as per Table B2 in Appendix B. When using Method 2, the relevant FFDI and GFDI are applied.

The values may be able to be refined within a jurisdiction, where sufficient climatological data is available and in consultation with the relevant authority.

|                        |    |         |             |          |               |     |
|------------------------|----|---------|-------------|----------|---------------|-----|
| Relevant Jurisdiction: | WA | Region: | Whole State | Method 1 | Applied FDI:  | 80  |
|                        |    |         |             | Method 2 | Applied FFDI: | N/A |
|                        |    |         |             |          | Applied GFDI: | N/A |

#### A1.2: 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 Clause 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 (refer to Appendix B) and that any required active management can be expected to continue in perpetuity, and this can be adequately justified.

##### 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                                                                                                                                                                                                                                                                                                           | G. GRASSLAND                                                                                                                                              |                    |                          |  |                           |     |
| Types Identified                                                                                                                                                                                                                                                                                                         | Tussock grassland G-22                                                                                                                                    |                    |                          |  |                           |     |
| Exclusion Clause                                                                                                                                                                                                                                                                                                         | N/A                                                                                                                                                       |                    |                          |  |                           |     |
| Effective Slope                                                                                                                                                                                                                                                                                                          | Measured                                                                                                                                                  | flat 0 degrees     | Applied Range (Method 1) |  | Upslope or flat 0 degrees |     |
| Foliage Cover (all layers)                                                                                                                                                                                                                                                                                               | <10%                                                                                                                                                      | Shrub/Heath Height | N/A                      |  | Tree Height               | N/A |
| Dominant & Sub-Dominant Layers                                                                                                                                                                                                                                                                                           | Grassland within the subject lot.                                                                                                                         |                    |                          |  |                           |     |
| Justification Comments:                                                                                                                                                                                                                                                                                                  | Classified as worst case scenario.                                                                                                                        |                    |                          |  |                           |     |
| Post Development Assumptions:                                                                                                                                                                                                                                                                                            | To be altered to non-vegetated elements such as roads and buildings. Some small gardens and POS areas will remain and must be maintained <10cm in height. |                    |                          |  |                           |     |
| <div><div></div><div></div></div>   |                                                                                                                                                           |                    |                          |  |                           |     |
| PHOTO ID: 1                                                                                                                                                                                                                                                                                                              |                                                                                                                                                           |                    | PHOTO ID: 2              |  |                           |     |
| <div><div></div><div></div></div> |                                                                                                                                                           |                    |                          |  |                           |     |
| PHOTO ID: 3                                                                                                                                                                                                                                                                                                              |                                                                                                                                                           |                    | PHOTO ID: 4              |  |                           |     |



PHOTO ID: 5



PHOTO ID: 6

| VEGETATION AREA 2                                                                                                                                                                                                                                                                                                                                    |                                                                                                 |                    |                          |  |                           |           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------|--------------------------|--|---------------------------|-----------|
| Classification                                                                                                                                                                                                                                                                                                                                       | A. FOREST                                                                                       |                    |                          |  |                           |           |
| Types Identified                                                                                                                                                                                                                                                                                                                                     | Open forest A-03                                                                                |                    |                          |  |                           |           |
| Exclusion Clause                                                                                                                                                                                                                                                                                                                                     | N/A                                                                                             |                    |                          |  |                           |           |
| Effective Slope                                                                                                                                                                                                                                                                                                                                      | Measured                                                                                        | flat 0 degrees     | Applied Range (Method 1) |  | Upslope or flat 0 degrees |           |
| Foliage Cover (all layers)                                                                                                                                                                                                                                                                                                                           | 30-70%                                                                                          | Shrub/Heath Height | N/A                      |  | Tree Height               | Up to 30m |
| Dominant & Sub-Dominant Layers                                                                                                                                                                                                                                                                                                                       | Eucalypt forest                                                                                 |                    |                          |  |                           |           |
| Understorey                                                                                                                                                                                                                                                                                                                                          | Unmanaged grasses and shrubs, dense surface fuels.                                              |                    |                          |  |                           |           |
| Justification Comments:                                                                                                                                                                                                                                                                                                                              | Not Required.                                                                                   |                    |                          |  |                           |           |
| Post Development Assumptions:                                                                                                                                                                                                                                                                                                                        | Onsite vegetation to be managed to low threat in perpetuity where the forest is within the APZ. |                    |                          |  |                           |           |
| <div><div></div><div></div></div>           |                                                                                                 |                    |                          |  |                           |           |
| PHOTO ID: 7                                                                                                                                                                                                                                                                                                                                          |                                                                                                 |                    | PHOTO ID: 8              |  |                           |           |
| <div><div></div><div></div></div> |                                                                                                 |                    |                          |  |                           |           |
| PHOTO ID: 9                                                                                                                                                                                                                                                                                                                                          |                                                                                                 |                    | PHOTO ID: 10             |  |                           |           |



PHOTO ID: 11



PHOTO ID: 12



PHOTO ID: 13



PHOTO ID: 14

| VEGETATION AREA 3                                                                                                                                      |                                  |                    |                                                                                                                                                         |  |                           |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------|-----------|
| Classification                                                                                                                                         | B. WOODLAND                      |                    |                                                                                                                                                         |  |                           |           |
| Types Identified                                                                                                                                       | Woodland B-05                    |                    |                                                                                                                                                         |  |                           |           |
| Exclusion Clause                                                                                                                                       | N/A                              |                    |                                                                                                                                                         |  |                           |           |
| Effective Slope                                                                                                                                        | Measured                         | flat 0 degrees     | Applied Range (Method 1)                                                                                                                                |  | Upslope or flat 0 degrees |           |
| Foliage Cover (all layers)                                                                                                                             | 10-30%                           | Shrub/Heath Height | N/A                                                                                                                                                     |  | Tree Height               | Up to 30m |
| Dominant & Sub-Dominant Layers                                                                                                                         | Majority Eucalypt trees, usually |                    |                                                                                                                                                         |  |                           |           |
| Understorey                                                                                                                                            | Occasional shrubs,               |                    |                                                                                                                                                         |  |                           |           |
| Justification Comments:                                                                                                                                | Onsite vegetation                |                    |                                                                                                                                                         |  |                           |           |
| Post Development Assumptions:                                                                                                                          | None required.                   |                    |                                                                                                                                                         |  |                           |           |
|  <div>32°0'32", 116°1'7", 27.7m, 92°<br/>27/11/2024 10:39:23</div>   |                                  |                    |                                                                                                                                                         |  |                           |           |
| PHOTO ID: 15                                                                                                                                           |                                  |                    |  <div>32°0'33", 116°1'8", 27.4m, 360°<br/>27/11/2024 09:45:17</div>  |  |                           |           |
| PHOTO ID: 16                                                                                                                                           |                                  |                    |                                                                                                                                                         |  |                           |           |
|  <div>32°0'31", 116°1'9", 39.1m, 238°<br/>27/11/2024 09:49:20</div> |                                  |                    |                                                                                                                                                         |  |                           |           |
| PHOTO ID: 17                                                                                                                                           |                                  |                    |  <div>32°0'30", 116°1'8", 27.6m, 312°<br/>27/11/2024 09:50:20</div> |  |                           |           |
| PHOTO ID: 18                                                                                                                                           |                                  |                    |                                                                                                                                                         |  |                           |           |



PHOTO ID: 19



PHOTO ID: 20



PHOTO ID: 21



PHOTO ID: 22



PHOTO ID: 23



PHOTO ID: 24

| VEGETATION AREA 4                                                                                                                                                                 |                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Classification                                                                                                                                                                    | N/A                                                              |
| Exclusion Clause                                                                                                                                                                  | 2.2.3.2 (f) Low threat vegetation - minimal fuel condition.      |
| Justification Comments:                                                                                                                                                           | Low threat area surrounding the existing dwelling.               |
| Post Development Assumptions:                                                                                                                                                     | Will be maintained to low threat by the landowner in perpetuity. |
| <div>  </div>  |                                                                  |
| PHOTO ID: 25                                                                                                                                                                      |                                                                  |
| <div>  </div>  |                                                                  |
| PHOTO ID: 26                                                                                                                                                                      |                                                                  |
| <div>  </div> |                                                                  |
| PHOTO ID: 27                                                                                                                                                                      |                                                                  |
| <div>  </div> |                                                                  |
| PHOTO ID: 28                                                                                                                                                                      |                                                                  |

| VEGETATION AREA 5                                                                                                                                                                                                                                                                                                                      |                                                                                                                              |                |                    |                          |     |                           |             |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------|--------------------------|-----|---------------------------|-------------|-----|
| Classification                                                                                                                                                                                                                                                                                                                         | G. GRASSLAND                                                                                                                 |                |                    |                          |     |                           |             |     |
| Types Identified                                                                                                                                                                                                                                                                                                                       | Tussock grassland G-22                                                                                                       |                |                    |                          |     |                           |             |     |
| Exclusion Clause                                                                                                                                                                                                                                                                                                                       | N/A                                                                                                                          |                |                    |                          |     |                           |             |     |
| Effective Slope                                                                                                                                                                                                                                                                                                                        | Measured                                                                                                                     | flat 0 degrees |                    | Applied Range (Method 1) |     | Upslope or flat 0 degrees |             |     |
| Foliage Cover (all layers)                                                                                                                                                                                                                                                                                                             | <10%                                                                                                                         |                | Shrub/Heath Height |                          | N/A |                           | Tree Height | N/A |
| Dominant & Sub-Dominant Layers                                                                                                                                                                                                                                                                                                         | Grassland.                                                                                                                   |                |                    |                          |     |                           |             |     |
| Justification Comments:                                                                                                                                                                                                                                                                                                                | Large areas of grassland on neighbouring properties. Cannot be guaranteed to be maintained to <10cm in height in perpetuity. |                |                    |                          |     |                           |             |     |
| Post Development Assumptions:                                                                                                                                                                                                                                                                                                          | Likely to experience occasional management by the landowner.                                                                 |                |                    |                          |     |                           |             |     |
| <div><div><div>-32°0'36", 116°1'6", 25.5m, 96°<br/>27/11/2024 10:51:52</div></div><div><div>-31°59'43", 116°0'45", 107°<br/>27/11/2024 10:52:34</div></div></div> |                                                                                                                              |                |                    |                          |     |                           |             |     |
| PHOTO ID: 29                                                                                                                                                                                                                                                                                                                           |                                                                                                                              |                |                    | PHOTO ID: 30             |     |                           |             |     |

| VEGETATION AREA 6              |                                                       |                    |                          |  |                           |           |
|--------------------------------|-------------------------------------------------------|--------------------|--------------------------|--|---------------------------|-----------|
| Classification                 | A. FOREST                                             |                    |                          |  |                           |           |
| Types Identified               | Open forest A-03                                      |                    |                          |  |                           |           |
| Exclusion Clause               | N/A                                                   |                    |                          |  |                           |           |
| Effective Slope                | Measured                                              | flat 0 degrees     | Applied Range (Method 1) |  | Upslope or flat 0 degrees |           |
| Foliage Cover (all layers)     | 30-70%                                                | Shrub/Heath Height | N/A                      |  | Tree Height               | Up to 30m |
| Dominant & Sub-Dominant Layers | Eucalypt forest.                                      |                    |                          |  |                           |           |
| Understorey                    | Unmanaged shrubs and grasses.                         |                    |                          |  |                           |           |
| Justification Comments:        | Offsite unmanaged areas, verge areas and creek areas. |                    |                          |  |                           |           |
| Post Development Assumptions:  | None required.                                        |                    |                          |  |                           |           |



32°0'34" 116°1'7", 25.1m, 331°  
27/11/2024 10:52:49

PHOTO ID: 31



32°0'34" 116°1'31.9m, 210°  
27/11/2024 09:47:56

PHOTO ID: 32



32°0'30" 116°1'11", 10.5m, 275°  
27/11/2024 10:56:32

PHOTO ID: 33



32°0'30" 116°1'38", 67.9m, 117°  
27/11/2024 10:56:45

PHOTO ID: 34



PHOTO ID: 35



PHOTO ID: 36



PHOTO ID: 37

| VEGETATION AREA 7                                                                                                                                                                                                                                                  |                                                                                                                                                                                     |                |                    |                          |  |                           |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------|--------------------------|--|---------------------------|-----------|
| Classification                                                                                                                                                                                                                                                     | A. FOREST                                                                                                                                                                           |                |                    |                          |  |                           |           |
| Types Identified                                                                                                                                                                                                                                                   | Open forest A-03                                                                                                                                                                    |                |                    |                          |  |                           |           |
| Exclusion Clause                                                                                                                                                                                                                                                   | N/A                                                                                                                                                                                 |                |                    |                          |  |                           |           |
| Effective Slope                                                                                                                                                                                                                                                    | Measured                                                                                                                                                                            | flat 0 degrees |                    | Applied Range (Method 1) |  | Upslope or flat 0 degrees |           |
| Foliage Cover (all layers)                                                                                                                                                                                                                                         | 30-70%                                                                                                                                                                              |                | Shrub/Heath Height | N/A                      |  | Tree Height               | Up to 30m |
| Dominant & Sub-Dominant Layers                                                                                                                                                                                                                                     | Eucalypt forest, high tree density.                                                                                                                                                 |                |                    |                          |  |                           |           |
| Understorey                                                                                                                                                                                                                                                        | Unmanaged grasses and shrubs                                                                                                                                                        |                |                    |                          |  |                           |           |
| Justification Comments:                                                                                                                                                                                                                                            | Vegetation on neighbouring properties to the west. Cannot be seen entirely from the property due to the density of the vegetation, assumed to be forest as the worst-case scenario. |                |                    |                          |  |                           |           |
| Post Development Assumptions:                                                                                                                                                                                                                                      | Offsite vegetation which cannot be managed by the facility.                                                                                                                         |                |                    |                          |  |                           |           |
| <div><div></div><div>PHOTO ID: 38</div></div> <div><div></div><div>PHOTO ID: 39</div></div>   |                                                                                                                                                                                     |                |                    |                          |  |                           |           |
| <div><div></div><div>PHOTO ID: 40</div></div> <div><div></div><div>PHOTO ID: 41</div></div> |                                                                                                                                                                                     |                |                    |                          |  |                           |           |

| VEGETATION AREA 8                                                                                                                                                                                                                                                                                                                                                        |                                   |                |                    |                          |  |                           |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------|--------------------|--------------------------|--|---------------------------|-----------|
| Classification                                                                                                                                                                                                                                                                                                                                                           | B. WOODLAND                       |                |                    |                          |  |                           |           |
| Types Identified                                                                                                                                                                                                                                                                                                                                                         | Woodland B-05                     |                |                    |                          |  |                           |           |
| Exclusion Clause                                                                                                                                                                                                                                                                                                                                                         | N/A                               |                |                    |                          |  |                           |           |
| Effective Slope                                                                                                                                                                                                                                                                                                                                                          | Measured                          | flat 0 degrees |                    | Applied Range (Method 1) |  | Upslope or flat 0 degrees |           |
| Foliage Cover (all layers)                                                                                                                                                                                                                                                                                                                                               | 10-30%                            |                | Shrub/Heath Height | N/A                      |  | Tree Height               | Up to 30m |
| Dominant & Sub-Dominant Layers                                                                                                                                                                                                                                                                                                                                           | Smooth bark Eucalypt trees.       |                |                    |                          |  |                           |           |
| Understorey                                                                                                                                                                                                                                                                                                                                                              | Unmanaged grasses                 |                |                    |                          |  |                           |           |
| Justification Comments:                                                                                                                                                                                                                                                                                                                                                  | Small offsite area of vegetation. |                |                    |                          |  |                           |           |
| Post Development Assumptions:                                                                                                                                                                                                                                                                                                                                            | None required.                    |                |                    |                          |  |                           |           |
| <div><div></div><div></div></div> |                                   |                |                    |                          |  |                           |           |
| PHOTO ID: 42                                                                                                                                                                                                                                                                                                                                                             |                                   |                |                    | PHOTO ID: 43             |  |                           |           |
| <div><div></div><div></div></div>                                                                                                                                                                    |                                   |                |                    |                          |  |                           |           |
| PHOTO ID: 44                                                                                                                                                                                                                                                                                                                                                             |                                   |                |                    |                          |  |                           |           |

| VEGETATION AREA 9                                                                                                                                      |                                                                               |                |                    |                                                                                                                                                          |  |                           |           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------|-----------|
| Classification                                                                                                                                         | A. FOREST                                                                     |                |                    |                                                                                                                                                          |  |                           |           |
| Types Identified                                                                                                                                       | Open forest A-03                                                              |                |                    |                                                                                                                                                          |  |                           |           |
| Exclusion Clause                                                                                                                                       | N/A                                                                           |                |                    |                                                                                                                                                          |  |                           |           |
| Effective Slope                                                                                                                                        | Measured                                                                      | flat 0 degrees |                    | Applied Range (Method 1)                                                                                                                                 |  | Upslope or flat 0 degrees |           |
| Foliage Cover (all layers)                                                                                                                             | 30-70%                                                                        |                | Shrub/Heath Height | N/A                                                                                                                                                      |  | Tree Height               | Up to 30m |
| Dominant & Sub-Dominant Layers                                                                                                                         | Eucalypt trees with occasional Casuarina trees.                               |                |                    |                                                                                                                                                          |  |                           |           |
| Understorey                                                                                                                                            | Unmanaged grasses and shrubs.                                                 |                |                    |                                                                                                                                                          |  |                           |           |
| Justification Comments:                                                                                                                                | Located along the verge and a large area of vegetation across Welshpool road. |                |                    |                                                                                                                                                          |  |                           |           |
| Post Development Assumptions:                                                                                                                          | Not likely to be changed.                                                     |                |                    |                                                                                                                                                          |  |                           |           |
|  <div>-32°0'16", 116°0'43", 19.1m, 54°<br/>27/11/2024 10:15:39</div> |                                                                               |                |                    |                                                                                                                                                          |  |                           |           |
| PHOTO ID: 45                                                                                                                                           |                                                                               |                |                    |  <div>-32°0'16", 116°0'51", 20.1m, 328°<br/>27/11/2024 10:21:13</div> |  |                           |           |
| PHOTO ID: 45                                                                                                                                           |                                                                               |                |                    | PHOTO ID: 46                                                                                                                                             |  |                           |           |
|  <div>-32°0'16", 116°0'52", 19.2m, 3°<br/>27/11/2024 10:21:31</div> |                                                                               |                |                    |                                                                                                                                                          |  |                           |           |
| PHOTO ID: 47                                                                                                                                           |                                                                               |                |                    |  <div>-32°0'17", 116°0'54", 18.1m, 60°<br/>27/11/2024 10:22:42</div> |  |                           |           |
| PHOTO ID: 47                                                                                                                                           |                                                                               |                |                    | PHOTO ID: 48                                                                                                                                             |  |                           |           |

| VEGETATION AREA 10                                                                         |                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Classification                                                                             | N/A                                                                                                                                                                                                                                                                                                                 |
| Exclusion Clause                                                                           | 2.2.3.2 (f) Low threat vegetation - minimal fuel condition.                                                                                                                                                                                                                                                         |
| Justification Comments:                                                                    | Garden areas maintained to low threat on neighbouring properties in close proximity to the dwellings and therefore are likely to be maintained in perpetuity.<br>Photo ID's 49-52, 57/58 include vegetation onsite which has been classified or small areas of grassland excluded where it has grown along a fence. |
| Post Development Assumptions:                                                              | Reasonably can be assumed to be maintained in perpetuity. Will be maintained as part of the APZ where within the lot.                                                                                                                                                                                               |
|          |                                                                                                                                                                                                                                                                                                                     |
| <p style="text-align: right;">-32°0'30", 116°0'58", 5.9m, 273°<br/>27/11/2024 10:00:35</p> |                                                                                                                                                                                                                                                                                                                     |
| <p style="text-align: center;">PHOTO ID: 49</p>                                            |                                                                                                                                                                                                                                                                                                                     |
|         |                                                                                                                                                                                                                                                                                                                     |
| <p style="text-align: right;">32°0'19", 116°0'47", 4.1m, 270°<br/>27/11/2024 10:11:47</p>  |                                                                                                                                                                                                                                                                                                                     |
| <p style="text-align: center;">PHOTO ID: 50</p>                                            |                                                                                                                                                                                                                                                                                                                     |
|         |                                                                                                                                                                                                                                                                                                                     |
| <p style="text-align: right;">32°0'18", 116°0'45", 0.9m, 262°<br/>27/11/2024 10:12:43</p>  |                                                                                                                                                                                                                                                                                                                     |
| <p style="text-align: center;">PHOTO ID: 51</p>                                            |                                                                                                                                                                                                                                                                                                                     |
|        |                                                                                                                                                                                                                                                                                                                     |
| <p style="text-align: right;">32°0'16", 116°0'43", 8.3m, 185°<br/>27/11/2024 10:14:55</p>  |                                                                                                                                                                                                                                                                                                                     |
| <p style="text-align: center;">PHOTO ID: 52</p>                                            |                                                                                                                                                                                                                                                                                                                     |



PHOTO ID: 53



PHOTO ID: 54



PHOTO ID: 55



PHOTO ID: 56



PHOTO ID: 57



PHOTO ID: 58



PHOTO ID: 59



PHOTO ID: 60



PHOTO ID: 61



PHOTO ID: 62



PHOTO ID: 63



PHOTO ID: 64



PHOTO ID: 65



PHOTO ID: 66



PHOTO ID: 67

## A1.3: EFFECTIVE SLOPE

### EXPLAINING THE ASSESSMENT METHODOLOGY APPLIED BY BUSHFIRE PRONE PLANNING

**DEFINITION:** Effective slope is "the slope under that classified vegetation which most influences the bushfire attack" (AS 3959:2018, Clause 1.5.11).

"The effective slope under the classified vegetation is not the same as the average slope for the land surrounding the site of the proposed building. The effective slope is that slope which most significantly influences bushfire behaviour" (AS 3959:2018, Clause CB4).

The slope is described as upslope, flat or downslope when viewed from an exposed element (e.g., building) and looking towards the vegetation. It is measured in degrees.

[Note: Additional relevant guidance provided by AS 3959:2018 and NSW RFS, Planning for Bushfire Protection (2019) is incorporated into the applied assessment methodology and is presented at the end of this explanation.]

### COMPOUND SLOPES UNDER VEGETATION AND DETERMINING SLOPE SIGNIFICANCE

**Non-Linear Slopes:** When the slope of ground under the vegetation out to the distance to be assessed (100 m or further if necessary), is not a straight line or nearly straight line slope, then it is made up of several different slopes i.e., it is a compound slope. The different slope angles and lengths must be factored into the determination of the effective slope value to be applied. Different slopes will potentially influence the bushfire rate of spread and intensity, both increasing and decreasing it.

**Significant Slope:** The AS 3959:2018 bushfire attack level determination methodology, with default inputs, models a fully developed bushfire. Therefore, a 'significant' slope is one that will significantly influence bushfire behaviour. To be 'significant' the length of the slope must be 'sufficient' to support a fully developed fire on that slope. The angle of a significant slope could be the determined effective slope for the area of classified vegetation if it is the one that 'most influences the bushfire attack'.

**Sufficient Slope Length:** Is a slope that will, as a minimum, allow the entire flame depth (flaming zone) of a fully developed fire (100m flame width) to exist on that slope.

The expected flame depth of a fully developed bushfire is a function of the length of time the flaming phase will exist on a section of the fuel bed (the 'residence time') and the bushfire's 'rate of spread'. For a given rate of spread, longer residence times result in greater flame depths. Greater flame depths are correlated with greater flame temperatures and greater flows of radiant heat.

The primary factors that will increase the residence time are:

- Heavier fine fuel loads of grass, leaf litter, twigs, bark etc less than 6mm in width and existing within the surface and near surface layers (and elevated fuel layers when contiguous with the base layers); and
- A greater percentage of larger fine fuels within the fuel load.

The primary factors that increase the rate of spread (apart from fire weather factors), include finer fuels, drier fuels, horizontal continuity of fuel and steeper upward ground slope in the direction of fire travel.

Example values:

- Residence Time: Grassfire 5 – 15 seconds, Forest fire 25 -50 seconds.
- Rate of Spread: Grassfires of a few km/hr are considered fast moving, 5-10 km/hr is common and fastest in the order of 25km/hr. Forest fire typically recorded in metres/hour with 1-1.5 km/hr being considered fast moving and fastest in the order of 3-4 km/hr.
- Flame Depth: More typically, a few metres for grasses to tens of metres for forest fires.

**An Isolated Slope:** For scenarios where there is a single significant slope (based on the above criteria) additional consideration would need to be given to the time and distance consumed by a bushfire still in its 'developing' phase. This will require due consideration be given to how it is potentially ignited i.e., from a single or multiple points, as this will influence the time and distance required to fully develop. For such scenarios, a normally significant slope may not be sufficiently long. It may be necessary to determine the potential bushfire impact more accurately by

justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width (using short fire run modelling).

**Determined Effective Slope:** Only a 'significant' slope can potentially be the effective slope by itself. In which case, for a defined area of classified vegetation area, the worst significant slope under that vegetation is to apply.

The table below presents Bushfire Prone Planning's considerations applied to assessing short and/or compound slopes in determining the effective slope.

| Slope Length (m) | Considered a Significant Slope | Considerations in Determining the Effective Slope                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| < 5              | No                             | Where these short slopes exist as part of a compound slope under an area of classified vegetation, they can be ignored as they will not influence the fire behaviour in that vegetation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 5-20             | No                             | These slopes will have a range of influence on fire behaviour from very little to a degree of influence that must be accounted for to some extent by the determined effective slope that is applied (i.e., with a greater length apply to a greater extent). But the actual slope of these shorter slopes is likely not to be applied as it is not a 'significant' length.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 20-30            | Maybe                          | <p>The same considerations applied to the 5-20m slope lengths should be applied here. However, more justification would need to be presented to support their assessment as not being 'significant' slopes.</p> <p>For these slope lengths, consideration must be given more broadly to the potential level of risks associated with a bushfire event in this location. The risk level will be a function of the bushfire hazard threat levels (direct attack mechanisms) within the immediate and broader assessment area as influenced by local topography, vegetation extents and types and the exposure and vulnerability of persons and/or buildings/structures to these threats. Higher risk levels require greater precaution meaning these slopes should be considered 'significant', and vice versa.</p> <p>Consider the potential for a bushfire on adjoining or nearby land be a source of ignition and/or pre-heating to vegetation on the subject slope.</p> <p>Consider if vegetation on the slope is likely be ignited by a single ignition point or is multipoint ignition possible from bushfire on adjoining slopes or the surrounding area. Single point ignition will require a fire to travel further before being fully developed (DFES considers less than 100m fire runs may be considered a short fire run for forest, woodland and scrub vegetation classifications, RFS NSW applies 150m).</p> <p>Isolated slopes of this length are less likely to be considered significant as compared to when part of a compound slope.</p> |
| >30              | Yes                            | Likely to always be a significant slope unless isolated (i.e., exists alone) – in which case, justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width, are approaches that may need to be applied.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

#### **BPP Approach - Slope Variation Within Areas of Vegetation**

When multiple 'significant' slope lengths with large differences in degrees of effective slope (or different applicable slope ranges when AS 3959:2018 Method 1 is applied), exists under a single vegetation classification, these will be delineated as separate vegetation areas of classified vegetation to account for the difference in potential bushfire behaviour and impact, in accordance with AS 3959:2018 clauses 2.2.5 and C2.2.5.

#### **Effective Slope Variation Due to Multiple Development Sites**

When the effective slope, under a single area of bushfire prone vegetation, will vary significantly relative to multiple proposed development sites (exposed elements), then the effective slopes corresponding to each of the different

locations, are separately identified. The relevant (worst case) effective slope is determined in the direction corresponding to the potential directions of fire spread towards the subject building(s).

#### **AS 3959:2018 EFFECTIVE SLOPE DETERMINATION - GUIDANCE**

The Standard presents a broad set of guidance statements that indicate the intent of deriving an effective slope value for use in calculations, rather than detailing the 'in the field' determination process. These include:

- Highlighting the importance of the value by stating "The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the severity of the fire and the ultimate level of radiant heat flux" (Clause C2.2.5). [Note: A common rule of thumb is that for every 10 degrees of upslope, a fire will double its rate of spread if moving in the direction of the prevailing wind].
- It may be necessary to consider the slope under the classified vegetation for distances greater than 100 m in order to determine the effective slope for that vegetation classification.
- "Where there is more than one slope within the classified vegetation, each slope shall be individually assessed, and the worst case Bushfire Attack Level shall apply" (Clause 2.2.5).

#### **NSW RFS 2019, PLANNING FOR BUSHFIRE PROTECTION - APPENDIX A1.5 - ADDITIONAL DETERMINATION GUIDANCE**

- "In identifying the effective slope - it may be found that there are a variety of slopes covering different distances within the vegetation. The effective slope is considered to be the slope under the vegetation which will most significantly influence the bushfire behaviour for each aspect. This is usually the steepest slope. In situations where this is not the case, the proposed approach must be justified".
- "Vegetation located closest to an asset may not necessarily be located on the effective slope".

#### **SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION**

The effective slopes determined from the site assessment are recorded in Table 3.2 of this Bushfire Management Plan.

Explanation and justification of their determination is presented below.

None required. No significant slopes were identified during the site visit.

## A1.4: SEPARATION DISTANCE

### Measuring

The separation distance is the distance in the horizontal plane between the receiver (building/structure or area of land being considered) and the edge of the classified vegetation (AS 3959:2018, clause 2.2.4)

The relevant parts of a building/structure from which the measurement is taken is the nearest part of an external wall or where a wall does not exist, the supporting posts or columns. Certain parts of buildings are excluded including eaves and roof overhangs.

The edge of the vegetation, for forests and woodlands, will be determined by the unmanaged understorey rather than either the canopy (drip line) or the trunk (AS 3959:2018, clause C2.2.5).

### Measured Separation Distance as a Calculation Input

If a separation distance can be measured because the location of the building/structure relative to the edge of the relevant classified vegetation is known, this figure can be entered into the BAL calculation. The result is a determined BAL rating.

### Assumed Separation Distance as a Calculation Input

When the building/structure location within the lot is not known, an assumed building location may be applied that would establish the closest positioning of the building/structure relative to the relevant area of vegetation.

The assumed location would be based on a factor that puts a restriction on a building location such as:

- An established setback from the boundary of a lot, such as a residential design code setback or a restrictive covenant; or
- Within an established building envelope.

The resultant BAL rating would be indicative and require later confirmation (via a Compliance Report) of the building/structure actual location relative to the vegetation to establish the determined BAL rating.

### Separation Distance as a Calculation Output

With the necessary site specific assessment inputs and using the AS 3959:2018 bushfire modelling equations, the range of separation distances that will correspond to each BAL rating (each of which represents a range of radiant heat flux), can be calculated. This has application for bushfire planning scenarios such as:

- When the separation distance cannot be measured because the exact location of the exposed element (i.e., the building, structure or area), relative to classified vegetation, is yet to be determined.

In this scenario, the required information is the identification of building locations onsite that will correspond to each BAL rating. That is, indicative BAL ratings can be derived for a variety of potential building/structure locations; or

- The separation distance is known for a given building, structure or area (and a determined BAL rating can be derived), but additional information is required regarding the exposure levels (to the transfer of radiant heat from a bushfire), of buildings or persons, that will exist at different points within the subject site.

The calculated range of separation distances corresponding to each BAL rating can be presented in a table and/or illustrated as a BAL Contour Map – whichever is determined to best fit the purpose of the assessment.

For additional information refer to the information boxes in Section 3 'Bushfire Attack Levels (BAL) - Understanding the Results and Section 3.2. 'Interpretation of the BAL Contour Map'.

## SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

For the subject development/use the applicable separation distances values are derived from calculations applying the assessed site data. They are an output value, not an input value and therefore are not presented or justified in this appendix.

The derived values are presented in Section 3, Table 3.1 and illustrated as a BAL contour map in Figure 3.2.

## APPENDIX B: ADVICE - ONSITE VEGETATION MANAGEMENT - THE APZ

### THE ASSET PROTECTION ZONE (APZ)

The APZ is an area surrounding a building/structure that is not vegetated and/or the retained or planted vegetation can be considered low threat based on flammability or moisture content characteristics or is actively managed to maintain minimal fuel loads. The primary objectives of establishing an APZ are:

1. Ensure a reduction in the exposure of the building/structure to bushfire direct attack mechanisms (threats) of flame contact, radiant heat transfer and ember attack, by establishing appropriate separation from the bushfire prone vegetation. The required APZ dimensions will be dependent on site specific conditions and the use of the site;
2. Ensure a reduction in the exposure of the building/structure to bushfire indirect attack mechanisms (threats) by:
  - Preventing surface fire spreading to the building/structure;
  - Minimising the potential for tree strike; and
  - Limiting the potential for consequential fire to impact the building/structure by eliminating, reducing and/or shielding consequential fire fuels. These fuels include accumulated debris, stored combustible/flammable items and constructed combustible items. Consequential fire, typically ignited by embers, is the primary cause of building loss in a bushfire event; and
3. To provide a defensible space for firefighting activities.

The Appendix B2 of the Guidelines provide guidance and requirements for meeting these objectives might be met (also refer to Appendix B2 in this BMP).

### B1: The Asset Protection Zone (APZ) - Dimension and Location Requirements

#### PLANNING APPLICATION REQUIREMENTS VERSUS LANDOWNER IMPLEMENTATION REQUIREMENTS

**ONE IDENTIFIES THE ABILITY OF DEVELOPMENT TO LIMIT EXPOSURE TO CERTAIN BUSHFIRE THREATS TO AN ACCEPTABLE LIMIT AND THE OTHER ESTABLISHES WHAT IS TO BE PHYSICALLY IMPLEMENTED SURROUNDING BUILDINGS/STRUCTURES**

#### THE 'PLANNING BAL-29' APZ

For planning approval purposes, an assessment against the Bushfire Protection Criteria (Guidelines) is conducted. Element 2: Siting and design, essentially establishes that the APZ must be of sufficient size to ensure the radiant heat impact of a bushfire on existing or future habitable buildings (as applicable) does not exceed 29kW/m<sup>2</sup> (BAL-29).

The APZ must be able to be maintained in a low threat state and satisfy the following:

**Dimensions:** The minimum dimensions of the 'Planning BAL-29' APZ are those that will ensure the potential radiant heat impact on the relevant buildings does not exceed 29 kW/m<sup>2</sup>. These dimensions will vary dependent on the site specific conditions.

**Location:** The 'Planning BAL-29' APZ dimensions must not extend past lot boundaries onto land the landowner has no responsibility for or control over. Limited exceptions include:

- When adjoining land is not vegetated (e.g., built out, roads, carparks, drainage systems, rock, water body etc.);
- When adjoining land does or will contain low threat vegetation (refer to Appendix B) and it can be justified that enforceable mechanisms are in place to ensure the APZ status of this land will exist in perpetuity. Such areas of land include:
  - Publicly managed areas of vegetation (e.g., public open space, recreation grounds/areas and services installed in a common section of land). For certain situations, evidence of an entity's

enforceable requirement to manage these areas to the required standard would be included in either the BAL Assessment Report or Bushfire Management Plan;

- o Land on a neighbouring lot that is/will be part of the required APZ surrounding buildings/structures on that lot, and/or required firebreak, and for which the owner of that lot has a recognised responsibility to implement and maintain.
- o Adjoining land for which a formalised and enforceable authority and responsibility is created for the owner of the lot on which development is proposed, or another third party, to manage vegetation in perpetuity, on land they do not own. This is not common, and the necessary evidence of the responsibility would be included in the BAL Assessment Report or Bushfire Management Plan.

#### KEY POINT

*The 'Planning BAL-29' APZ dimensions are not necessarily those that must be physically implemented and maintained by a landowner. Implementation requirements may be different (see 'Determined BAL Rating APZ' below).*

*The purpose of identifying the ability of proposed development to apply the 'Planning BAL-29' APZ dimensions is solely to inform decision makers as to the ability of the proposed building works to limit exposure to certain bushfire threats (flame contact, radiant heat transfer and ember attack), to the extent represented by a BAL-29 rating.*

*Note for certain vulnerable land uses, evidence of the ability to implement a larger APZ may be required to inform planning decisions. These include dimensions corresponding to radiant heat impact levels of 10 kW/m<sup>2</sup> and/or 2 kW/m<sup>2</sup> and calculated using a flame temperature of 1200 K – rather than 29kW/m<sup>2</sup> at 1090 K.*

#### THE 'DETERMINED BAL RATING' APZ

The dimensions associated with the 'Determined BAL Rating APZ' are derived for the specific site conditions and are to be physically implemented and maintained by the landowner. The rating also establishes the bushfire construction requirements for any new building works which results in the built resilience to bushfire threats corresponding to their distance from the bushfire hazard. Variations of these dimensions will only exist as the result of either:

- A requirement presented within an associated Bushfire Management Plan to increase the size of the APZ as part of an alternative solution, and which is subsequently approved by the decision maker; or
- A directive of the relevant Local Government through their annual Firebreak/Hazard Reduction Notice (see below) that results in a larger dimension.

The applicable 'determined' BAL rating is stated in the BAL Assessment Data section of the BAL Assessment Report or Bushfire Management Plan (when it is possible to be a 'determined' rather than 'indicative' value).

If an 'indicative' or 'conditional' rather than a 'determined' BAL rating is stated, the corresponding separation distances (dimensions) are just informative. Confirmation that the stated BAL rating (or a different rating) will apply, is still subject to either certain physical requirements being met or approval from relevant authorities for native vegetation removal is obtained (refer to explanatory information in Section 3).

**Dimensions:** The minimum dimensions of the 'BAL Rating APZ' will be those associated with the 'determined' BAL rating for the relevant buildings/structures and stated in the following Table B1.

*Note for certain vulnerable land uses and relevant buildings/areas, the 'BAL Rating' APZ dimensions may be replaced with dimensions corresponding to the specific radiant heat impact levels of 10 kW/m<sup>2</sup> and 2 kW/m<sup>2</sup> and calculated using a flame temperature of 1200K – rather than 29kW/m<sup>2</sup> at 1090 K.*

**Location:** As for the 'Planning BAL-29' APZ.

### THE 'LOCAL GOVERNMENT' APZ

Certain Local Government's state the dimensions of the APZ that must be established surrounding buildings in their annual Firebreak/Hazard Reduction Notice. For certain vegetation/sites, based on environmental considerations, they may also establish a maximum allowable dimension, typically that corresponding to a BAL-29 rating.

### THE 'REQUIRED' APZ

The dimensions associated with the 'Required' APZ are to be established and maintained by the landowner within the subject lot and surrounding the subject buildings/structures. The 'Required APZ' will be appropriately depicted in Reports and Plans on the Property Bushfire Management Statement when it is required to be included.

**Dimensions:** The 'Required APZ' dimensions are the minimum distances away from the subject building/structure that the APZ must extend towards each relevant area of classified vegetation (note: a distance may also be a maximum distance when relevant as an environmental constraint). These distances are stated in the following Table B1.

The dimensions to implement are determined by:

- A. Those associated with the 'Determined BAL APZ' for the subject building(s) when distances are greater than 'B' below (except when 'B' has established a maximum distance); or
- B. The 'Local Government' APZ' derived from their 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' as they may apply to different areas of classified vegetation.

**Location:** As for the 'Planning BAL-29' APZ.

Table B1: The APZ dimensions required to be implemented and maintained by the landowner.

| ESTABLISHING THE 'REQUIRED' APZ DIMENSIONS TO BE IMPLEMENTED AND MAINTAINED BY LANDOWNER WITHIN THEIR LOT                                                                                                                                                           |                           |               |                                                                                                             |          |            |                     |                                                       |                 |                                            |                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------|-------------------------------------------------------------------------------------------------------------|----------|------------|---------------------|-------------------------------------------------------|-----------------|--------------------------------------------|-------------------------------|
| Relevant Buildings(s)                                                                                                                                                                                                                                               | Vegetation Classification |               | MINIMUM REQUIRED SEPARATION DISTANCES BETWEEN BUILDING/STRUCTURE AND BUSHFIRE PRONE VEGETATION <sup>1</sup> |          |            |                     |                                                       |                 |                                            |                               |
|                                                                                                                                                                                                                                                                     |                           |               | Dimensions Associated with the 'BAL Rating' APZ                                                             |          |            |                     | Dimensions Associated with the 'Local Government' APZ |                 | The 'Required' APZ Dimensions <sup>3</sup> | Existing Separation Distances |
|                                                                                                                                                                                                                                                                     |                           |               | Potential Bushfire Impact <sup>2</sup>                                                                      |          |            | Separation Distance | Firebreak / Hazard Reduction Notice                   | Maximum Allowed |                                            |                               |
|                                                                                                                                                                                                                                                                     | Area                      | Class         | Stated As                                                                                                   | Value    | Status     |                     |                                                       | metres          | metres                                     | metres                        |
|                                                                                                                                                                                                                                                                     |                           |               |                                                                                                             |          |            |                     |                                                       |                 |                                            |                               |
| Lots:<br>112, 117-119,<br>135-138, 139, 140,<br>155, 156, 157, 172,<br>173, 185, 186                                                                                                                                                                                | 1                         | (G) Grassland | BAL Rating                                                                                                  | BAL-LOW  | Indicative | 50                  | 20m                                                   | -               | 50                                         | -                             |
|                                                                                                                                                                                                                                                                     | 2                         | (A) Forest    |                                                                                                             |          |            | 100                 |                                                       | -               | 100                                        | -                             |
|                                                                                                                                                                                                                                                                     | 3                         | (B) Woodland  |                                                                                                             |          |            | 100                 |                                                       | -               | 100                                        | -                             |
| Lots:<br>1,2, 4, 5, 8-14,<br>18-22, 25-27, 31-40,<br>42-52, 55-64, 66-76,<br>81-102, 107-111,<br>113-116 121 – 125<br>130-134, 141-145,<br>150-154, 158-162,<br>167-171, 174-177,<br>180-184, 187-190<br><br>Buildings:<br>Community Facilities<br>Wellness Retreat | 1                         | (G) Grassland | BAL Rating                                                                                                  | BAL-12.5 | Indicative | 17                  |                                                       | -               | 20                                         | -                             |
|                                                                                                                                                                                                                                                                     | 2                         | (A) Forest    |                                                                                                             |          |            | 42                  |                                                       | -               | 42                                         | -                             |
|                                                                                                                                                                                                                                                                     | 3                         | (B) Woodland  |                                                                                                             |          |            | 29                  |                                                       | -               | 29                                         | -                             |

|                                                                                                                                                                       |   |               |            |        |            |    |  |   |    |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------|------------|--------|------------|----|--|---|----|---|
| Lots:<br>6, 17, 23, 65, 77, 80,<br>103, 106 126, 129,<br>146, 149, 163, 166,<br>178, 179<br>Buildings:<br>Residential<br>Workshop<br>VCMT (northwest)                 | 1 | (G) Grassland | BAL Rating | BAL-19 | Indicative | 12 |  | - | 20 | - |
|                                                                                                                                                                       | 2 | (A) Forest    |            |        |            | 31 |  | - | 31 | - |
|                                                                                                                                                                       | 3 | (B) Woodland  |            |        |            | 20 |  | - | 20 | - |
| Lots:<br>3, 7, 15, 16, 24, 28,<br>29, 30, 41, 53, 54,<br>78, 79, 104, 105,<br>127, 128, 147, 148,<br>164, 165<br>Buildings:<br>Clubhouse<br>Admin<br>VCMT (Southeast) | 1 | (G) Grassland | BAL Rating | BAL-29 | Indicative | 8  |  | - | 20 | - |
|                                                                                                                                                                       | 2 | (A) Forest    |            |        |            | 21 |  | - | 21 | - |
|                                                                                                                                                                       | 3 | (B) Woodland  |            |        |            | 14 |  | - | 20 | - |

**Note 1:** Refer to all explanatory information on the preceding pages.

**Note 2:** For the bushfire direct attack mechanisms of flame contact, radiant heat transfer and, to some extent, ember attack.

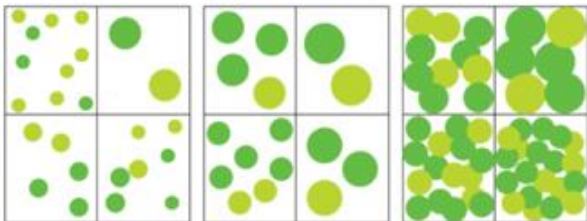
**Note 3:** These are minimum distances unless a maximum is being applied by a local government.

**Comments:** The City of Kalamunda Fire Hazard Reduction Notice states that all properties >5000m<sup>2</sup> must maintain firebreaks (to include the internal accessways). A 20m APZ is to be installed around all buildings or assets. Grass must be maintained within the APZ and within 10m of firebreaks.

## B2: APZ Technical Requirements Established by the Guidelines (DPLH/WAPC)

Within the Guidelines the APZ requirements are established in Appendix B2: Siting and Design. This includes Table 9 reproduced below.

**Table 9:** Asset Protection Zone (APZ) technical requirements

| 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 less than 6 mm in thickness)                                | <ul style="list-style-type: none"> <li>Should be managed and removed on a regular basis to be maintained as low threat vegetation</li> <li>Should be maintained at less than two tonnes per hectare (on average)</li> <li>Mulches should be non-combustible such as stone, gravel, shells, rock or crushed mineral earth or wood mulch more than five millimetres in thickness.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Trees* (more than 6 m in height)                                                                                | <ul style="list-style-type: none"> <li>Trunks at maturity should be a minimum distance of six metres from all elevations of the building</li> <li>Branches at maturity should not touch or overhang a building or powerline</li> <li>Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation.</li> <li>Canopy cover within the APZ should be less than 15 per cent of the total APZ area</li> <li>Tree canopies at maturity should be at least 5 m apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided the total canopy cover within the APZ does not exceed 15 per cent and is not connected to the tree canopy outside the APZ.</li> </ul> <p style="text-align: center;">Tree canopy cover – ranging from 15 to 70 per cent at maturity</p>  <p style="text-align: center;">15%                      30%                      70%</p> |
| Shrub* and scrub* (0.5 m to 6 m in height). Shrub and scrub more than 6 m in height are to be treated as trees. | <ul style="list-style-type: none"> <li>Should not be located under trees or within three metres of buildings</li> <li>Should not be planted in clumps more than five square metres in area</li> <li>Clumps should be separated from each other and any exposed window or door by at least 10 metres.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Ground cover* (less than 0.5 m in height. Ground cover more than 0.5 m in height is to be treated as shrub)     | <ul style="list-style-type: none"> <li>Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above</li> <li>Can be located within two metres of a structure but three metres from windows or doors if more than 100 mm in height.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Grass                                                                                                           | <ul style="list-style-type: none"> <li>Grass should be maintained at a height of 100 mm or less, at all times</li> <li>Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 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 cover, grass and non-combustible mulches as prescribed above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Liquid petroleum gas cylinders                                                                                  | <ul style="list-style-type: none"> <li>Should be located on the side of a building farthest 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</li> <li>The pressure relief valve should point away from the house</li> <li>No flammable material within six metres from the front of the valve</li> <li>Must sit on a firm, level and non-combustible base and be secured to a solid structure.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Notes:

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

**Fine fuel load is the combustible, dead or dry vegetation matter on the ground, near ground, or elevated. Fine fuel includes grass, leaves, bark and twigs less than six millimetres in diameter that ignite readily and are burnt rapidly when dry.**

**Fine fuel should be maintained at less than 2t/ha. 100gm/m<sup>2</sup> equates to 1t/ha. To estimate a fuel load (in t/ha), collect the dry fine fuel from a representative one square meter and weigh (in grams using kitchen scales) and multiply the weight by 0.01.**

|                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees. | <ul style="list-style-type: none"> <li>• Should not be located under trees or within three metres of buildings.</li> <li>• Should not be planted in clumps &gt;5 square metres in area.</li> <li>• Clumps should be separated from each other and any exposed window or door by at least 10 metres.</li> </ul>                                                                                                                                                                                                                                      |
| Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)                 | <ul style="list-style-type: none"> <li>• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above.</li> <li>• Can be located within two metres of a structure, but three metres from windows or doors if &gt;100 millimetres in height.</li> </ul>                                                                                                                                                                                                                                  |
| Grass                                                                                                                   | <ul style="list-style-type: none"> <li>• Grass should be maintained at a height of 100 millimetres or less, at all times.</li> <li>• Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.</li> </ul>                                                                                                                                                                                                                                                          |
| Defendable space                                                                                                        | <ul style="list-style-type: none"> <li>• 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.</li> </ul>                                                                                                                                                                                                                                                                                       |
| LP Gas Cylinders                                                                                                        | <ul style="list-style-type: none"> <li>• 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.</li> <li>• The pressure relief valve should point away from the house.</li> <li>• No flammable material within six metres from the front of the valve.</li> <li>• Must sit on a firm, level and non-combustible base and be secured to a solid structure.</li> </ul> |

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

### **B3: APZ Technical Requirements Established by the Local Government**

Refer to the firebreak / hazard reduction 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 in accordance with Section 3.4 of the Guidelines.

A copy of the applicable 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.

## B4: Vegetation Excluded from Classification & Ensuring Continued Low Threat Status

### EXPLANATORY NOTES

When applying AS 3959:2018 BAL determination methodology, vegetation adjoining or adjacent to the subject site can be excluded from classification based on being 'low threat'. To maintain this status, certain requirements must continue to be met in accordance with the below extract from AS3959:2018. Refer to the 'Classified Vegetation and Topography Map' for the relevant low threat areas associated with the subject site.

Determination of 'low threat' vegetation is based on factors such as:

- Proximity to the subject site
- Small areas of vegetation
- Low flammability
- High moisture content
- Low fuel load

Aside from a naturally occurring low fuel load, vegetation maintained in a minimal fuel condition through active management can be excluded. The associated key requisite is that the active management can be expected to continue in perpetuity, and this can be adequately justified.

Acceptable forms of justification typically involve supportable evidence or the existence of an enforceable mechanism. Examples of enforceable mechanisms include:

- Requirements established by a Section 33 (Bush Fires Act 1954) notice issued by a local government;
- An appropriate and enforceable agreement between relevant parties (which may involve additions to land titles); and
- For public open space, written evidence that the land manager e.g., local government or State Government Department, agrees to maintain the public open space in a low threat state in perpetuity.

15

AS 3959:2018

#### 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 C: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

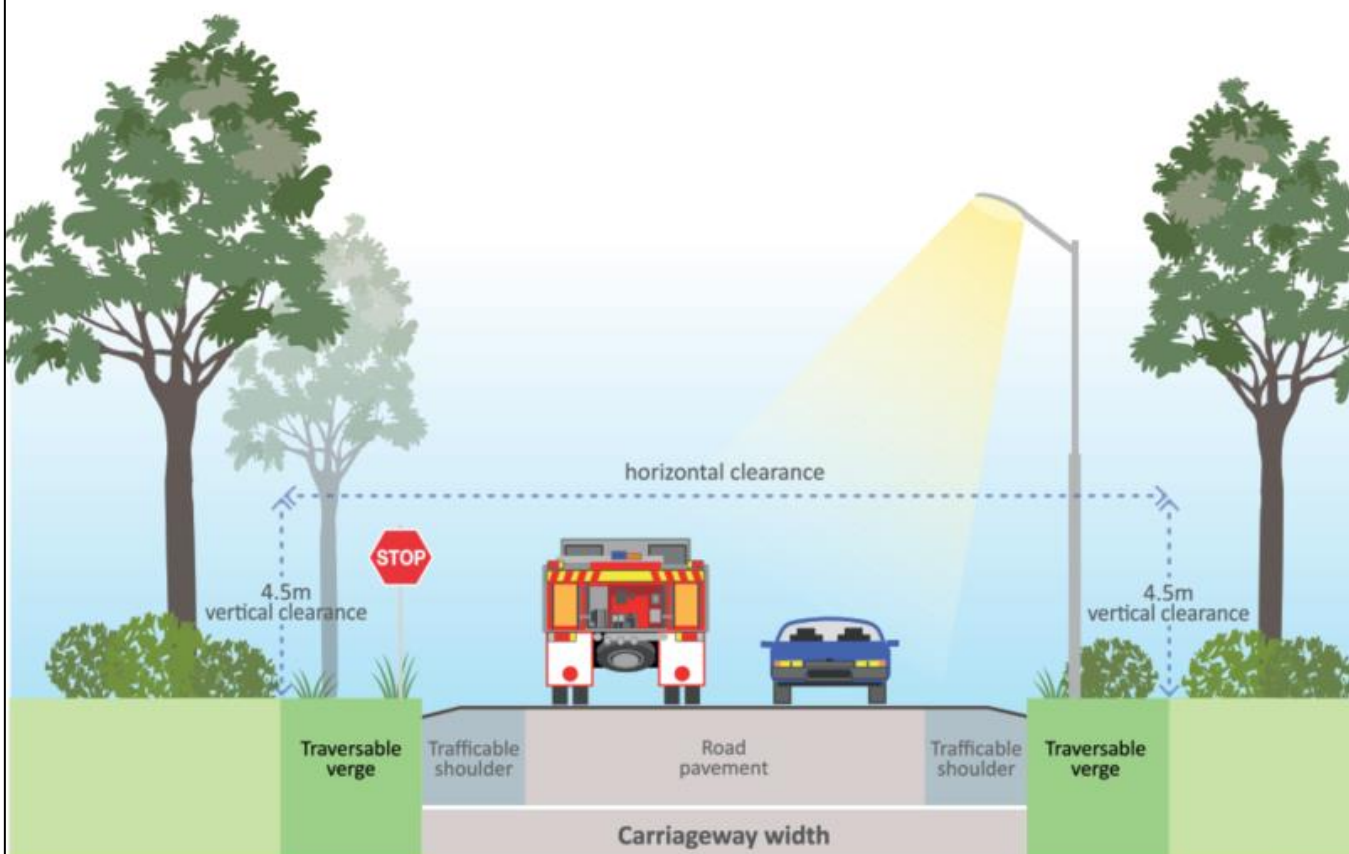
The Planning for Bushfire Guidelines (DPLH/WAPC) (as amended), can be sourced online and establishes:

- In sections 5 to 8, The vehicular access acceptable solutions (corresponding to a planning stage and land use type), that will achieve the required outcomes of State Planning Policy Bushfire 3.7 (SPP 3.7); and
- In Appendix B3, the vehicular access components technical requirements and general considerations.

Common requirements are presented in this appendix. Reference the Guidelines for specific requirements.

### ROAD COMPONENT TERMINOLOGY

**Figure 26:** Area encompassing horizontal clearance and vertical clearance



**Horizontal clearance:** The carriageway width (including the road pavement and trafficable shoulder) and traversable verge that provides for the movement and parking of vehicles and area required by emergency services to operate. Infrastructure and vegetation within the traversable verge should be frangible, however, non-frangible items can occur providing they do not restrict vehicular movement in the event of an emergency.

## VEHICULAR ACCESS TECHNICAL REQUIREMENTS

**Table 10:** Vehicular access technical requirements

|                                              | 1               |        | 2            |        | 3                                 |        | 4                                      |        | 5                                           |        |
|----------------------------------------------|-----------------|--------|--------------|--------|-----------------------------------|--------|----------------------------------------|--------|---------------------------------------------|--------|
| TECHNICAL REQUIREMENTS                       | PERIMETER ROADS |        | PUBLIC ROADS |        | EMERGENCY ACCESS WAY <sup>3</sup> |        | FIRE SERVICE ACCESS ROUTE <sup>3</sup> |        | BATTLE-AXE & PRIVATE DRIVEWAYS <sup>1</sup> |        |
| MAP OF BUSH FIRE PRONE AREAS DESIGNATION     | Area 2          | Area 1 | Area 2       | Area 1 | Area 2                            | Area 1 | Area 2                                 | Area 1 | Area 2                                      | Area 1 |
| Minimum horizontal clearance (metres)        | 12              | 8      | See note 5   |        | 10                                | 6      | 10                                     | 6      | 6                                           |        |
| Minimum vertical clearance (metres)          | 4.5             |        |              |        |                                   |        |                                        |        |                                             |        |
| Minimum weight capacity (tonnes)             | 15              |        |              |        |                                   |        |                                        |        |                                             |        |
| Maximum grade unsealed road <sup>2</sup>     | See note 5      |        | See note 5   |        | 1:10 (10% or 6°)                  |        |                                        |        |                                             |        |
| 1:7 (14.3% or 8°)                            |                 |        |              |        |                                   |        |                                        |        |                                             |        |
| 1:10 (10% or 6°)                             |                 |        |              |        |                                   |        |                                        |        |                                             |        |
| 8.5                                          |                 |        |              |        |                                   |        |                                        |        |                                             |        |
| Maximum grade sealed road <sup>2,4</sup>     |                 |        |              |        |                                   |        |                                        |        |                                             |        |
| Maximum average grade sealed road            |                 |        |              |        |                                   |        |                                        |        |                                             |        |
| Minimum inner radius of road curves (metres) |                 |        |              |        |                                   |        |                                        |        |                                             |        |

### Notes:

<sup>1</sup> Driveways and battle-axe legs to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision where not required to comply with the widths in this Appendix or the Guidelines.

<sup>2</sup> Dips must have no more than a 1 in 8 (12.5% - 7.1 degrees) entry and exit angle.

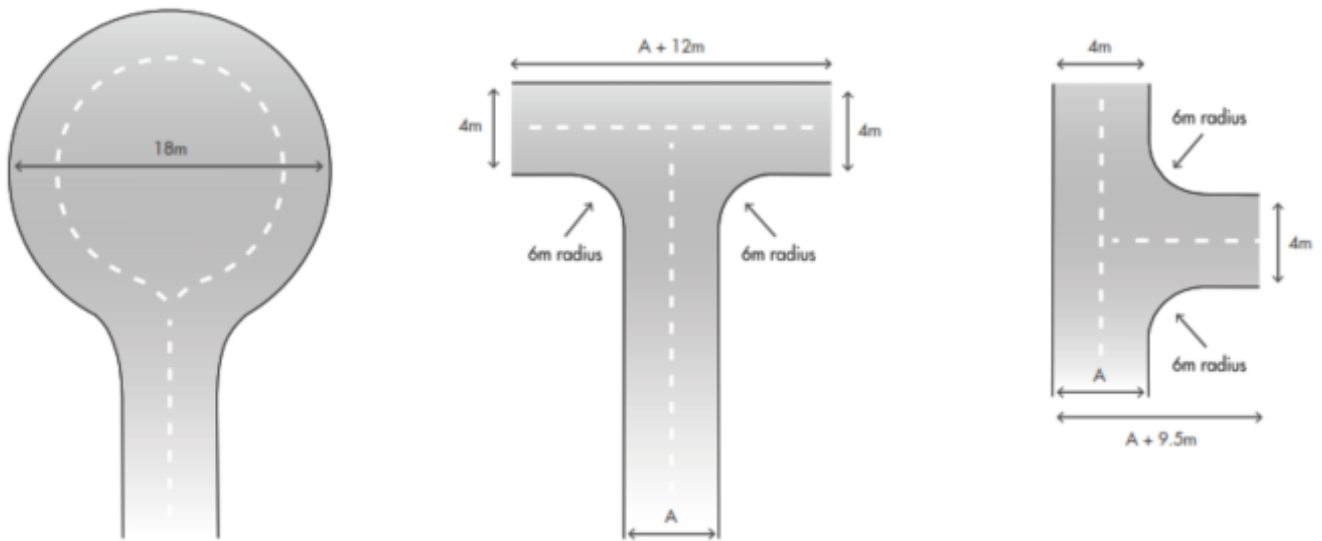
<sup>3</sup> To have crossfalls between 3 per cent and 6 per cent.

<sup>4</sup> For sealed roads only the maximum grade of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50 metres is permissible, except for short constrictions to 3.5 metres for no more than 30 metres in length where an obstruction cannot be reasonably avoided or removed.

<sup>5</sup> As outlined in the Institute of [Public Works Engineering Australasia \(IPWEA\) subdivision guidelines](#), [Liveable Neighbourhoods](#), [Austroads Standards](#) Main Roads standard, supplement, policy or guideline and/or any applicable or relevant local government standard or policy.

## TURN-AROUND AREA – DESIGN REQUIREMENTS

**Figure 30:** Design requirements for a turn-around area



## APPENDIX D: TECHNICAL REQUIREMENTS FOR FIREFIGHTING WATER SUPPLY

The Planning for Bushfire Guidelines (DPLH/WAPC) (as amended), can be sourced online and establishes:

- In sections 5 to 8, The water supply acceptable solutions (corresponding to a planning stage and land use type), that will achieve the required outcomes of State Planning Policy Bushfire 3.7 (SPP 3.7); and
- In Appendix B4, the water supply technical requirements and general considerations.

The information provided in this Appendix is additional to that provided in the Guidelines. It includes:

- For reticulated water supply, the hydrant location specifications established by the WA Water Corporation (Design Standard DS 63), as dependant on land use type and relevant to bushfire planning assessments (highlighted). Note: the maximum distance from a hydrant to the rear of a lot/building is generally interpreted as not applicable to large lot sizes where the maximum distance becomes an impractical limitation i.e., typically rural residential areas; and
- Images of example installations of acceptable water supply tanks and outlet fittings.

### D1: Hydrant Location in Reticulated Areas

Design Standard DS 63  
Water Reticulation Standard



#### 2.2.1.5 Appurtenances

##### c. Hydrants

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

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