



## **Bushfire Assessment**

**Industrial subdivision**

**221-227 Luddenham Road,  
Orchard Hills**

**HBB Property**

**07 May 2024**

**(Ref: 20074)**

---

report by  
**david peterson**

**0455 024 480**

david@petersonbushfire.com.au

po box 391 terrigal nsw 2260

**petersonbushfire.com.au**

FPA AUSTRALIA (NO.BPAD18882)  
BPAD LEVEL 3 ACCREDITED PRACTITIONER

ABN 28 607 444 833

# Contents

<b>1</b>	<b>Introduction .....</b>	<b>3</b>
1.1	Background .....	3
1.2	Location of subject land .....	3
1.3	Development proposal .....	5
1.3	Assessment requirements .....	8
<b>2</b>	<b>Bushfire prone land .....</b>	<b>10</b>
<b>3</b>	<b>Bushfire hazard .....</b>	<b>12</b>
3.1	Predominant vegetation .....	12
3.2	Effective slope .....	12
<b>4</b>	<b>Bushfire protection measures .....</b>	<b>14</b>
4.1	Access .....	16
4.2	Construction standards .....	18
4.3	Landscaping and vegetation management .....	18
4.4	Emergency and evacuation .....	18
4.5	Water supply and other utilities .....	20
4.6	Hazardous materials .....	20
<b>5</b>	<b>Conclusion and recommendations .....</b>	<b>21</b>
	<b>References .....</b>	<b>24</b>
	<b>Appendix A - Photographs .....</b>	<b>25</b>

# 1 Introduction

<b>Street or property name:</b>	221-227 Luddenham Road	
<b>Suburb, town or locality:</b>	Orchard Hills	<b>Postcode:</b> 2748
<b>Lot/DP no:</b>	Lots 1 & 2 DP 1293805	
<b>Local Government Area:</b>	Penrith City Council	
<b>Type of development:</b>	Industrial Subdivision for future warehouse development	

## 1.1 Background

HBB Property commissioned Peterson Bushfire to prepare a Bushfire Assessment Report for a proposed industrial development on a lot identified as 'bushfire prone land'.

This report presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation for development proposals on bushfire prone land.

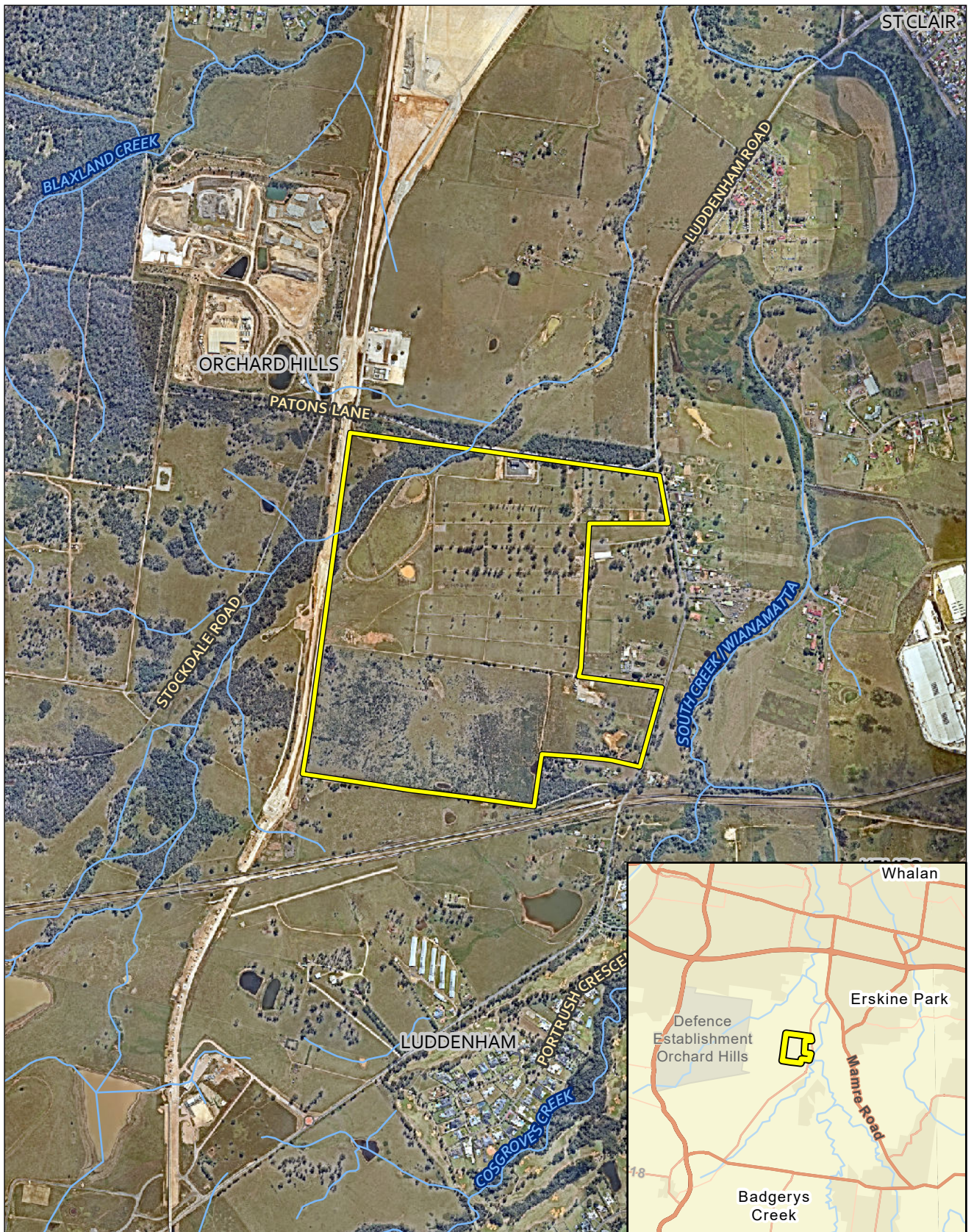
This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

## 1.2 Location of subject land



The subject land is the Alspec Industrial Business Park (AIBP) to be located at 221-227 Luddenham Road, Orchard Hills. Figure 1 shows the location of the subject land.

The AIBP Planning Proposal was lodged to Penrith City Council (PCC) in December 2022 and finalised early 2024. The AIBP Planning Proposal amended the Penrith Local Environmental Plan (PLEP) 2010 through rezoning the central and eastern portions of the AIBP site to E4 General Industrial which permits the development and operation of warehouse and distribution uses.





### Legend

-  Watercourse
-  Subject Land



Date: 1/05/2024

0 125 250 500  
Metres

**Figure 1: Location of the Subject Land**

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap



### 1.3 Development proposal

The development proposal consists of the subdivision of the subject land into nine lots and infrastructure works including:

- Clearing of bio certified vegetation within the development footprint;
- Dam dewatering;
- Bulk earthworks for the entire estate;
- Construction of the main internal estate road, including footpaths, cycleways, street lighting and street landscaping;
- Proposed flood storage basins in the northwest corner of the site;
- Proposed water quality (bioretention) basins, on-site detention basins and water storage basins;
- New services reticulation within the road reserve including water, sewer, electrical and telecommunications; and
- Dedication of the estate road to Council as public road.
- Dedication of land to Council for the future widening of Luddenham Road in accordance with the VPA.




Figure 2 shows the proposed plan of subdivision relating to this proposal and Figure 3 shows the indicative concept masterplan demonstrating what future warehouse development may entail.

The Bushfire Assessment Report prepared by Peterson Bushfire for the AIBP Planning Proposal (12<sup>th</sup> August 2020) presented a summary of findings and recommendations still of relevance to this proposal. Bushfire protection measures recommended within the Bushfire Assessment Report for the Planning Proposal are listed below:

- Provision of defendable space consisting of public roads and 6 m wide fire access roads.
- Bushfire Attack Level (BAL) application for future buildings where necessary.
- Adequate access for emergency response and evacuation consisting of alternate access to the existing road network.
- Compliant road widths and design.
- Appropriate landscaping.
- Adequate water supply to allow fire-fighting operations by fire authorities.



### Legend

-  Watercourse
-  Subject Land
-  Cadastre



Date: 1/05/2024

0 100 200 400  
Metres

**Figure 2: The Proposal**




Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap





### Legend

-  Watercourse
-  Subject Land
-  Cadastre



Date: 1/05/2024

0 100 200 400  
Metres

**Figure 3: Indicative Masterplan**

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap



### 1.3 Assessment requirements

The subject land is identified as bushfire prone land as shown by the bushfire prone land mapping on Figure 4. The future uses does not involve habitable uses (Class 1, 2 or 3) or Special Fire Protection Purpose (SFPP) development as defined by 'Planning for Bush Fire Protection 2019' (PBP). Section 8.3 of PBP prescribes the assessment methodology and bushfire protection measures for other uses that do not involve a habitable dwelling or SFPP development.

In order to comply with PBP, the following conditions must be met:

- *satisfy the aim and objectives of PBP outlined in Chapter 1;*
- *consider any issues listed for the specific purpose for the development set out in this chapter; and*
- *propose an appropriate combination of bushfire protection measures.*

It is also important to ensure that a 'defendable space' is provided for the size and scale of the development.

The aim and objectives of PBP are listed below:

1. *The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.*
2. The objectives are to:
  - a) *afford buildings and their occupants protection from exposure to a bush fire;*
  - b) *provide for a defendable space to be located around buildings;*
  - c) *provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;*
  - d) *ensure that appropriate operational access and egress for emergency service personnel and occupants is available;*
  - e) *provide for ongoing management and maintenance of BPMs; and*
  - f) *ensure that utility services are adequate to meet the needs of firefighters.*

Section 8.3.1 of PBP lists the issues specific to Buildings Class 5-8. As stated in PBP, the NCC does not provide for any bushfire specific performance requirements for these building classes. As such the Asset Protection Zones (APZ) and Bushfire Attack Levels (BAL) do not apply as deemed-to-satisfy provisions for bushfire protection. The general fire safety construction provisions of the NCC are taken as acceptable solutions however construction requirements for bushfire protection (i.e. BALs) are to be considered on a case-by-case basis in order to satisfy the aim and objectives of PBP.

The specific issues to be assessed for Buildings Class 5-8 are in relation to access, water supply and services, and emergency and evacuation planning as follows:

1. *Provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;*
2. *Provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development;*
3. *Provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building; and*
4. *Provide for the storage of hazardous materials away from the hazard wherever possible.*

In addition to the above requirements of PBP, at the time of report preparation, the RFS were drafting policy to clarify the application of bushfire protection measures to industrial buildings such as warehouses. The draft wording of the policy has not been made available, however consultation with the RFS (over telephone) has confirmed that warehouses in Bushfire Attack Level BAL-FZ will be permitted providing the building can be designed and constructed to comply with the BAL-FZ specifications as listed within Australian Standard 'AS 3959-2018 Construction of buildings in bushfire-prone areas'. If compliance with BAL-FZ construction specifications cannot be achieved, then an APZ will be required to prevent BAL-FZ affectation.

## 2 Bushfire prone land

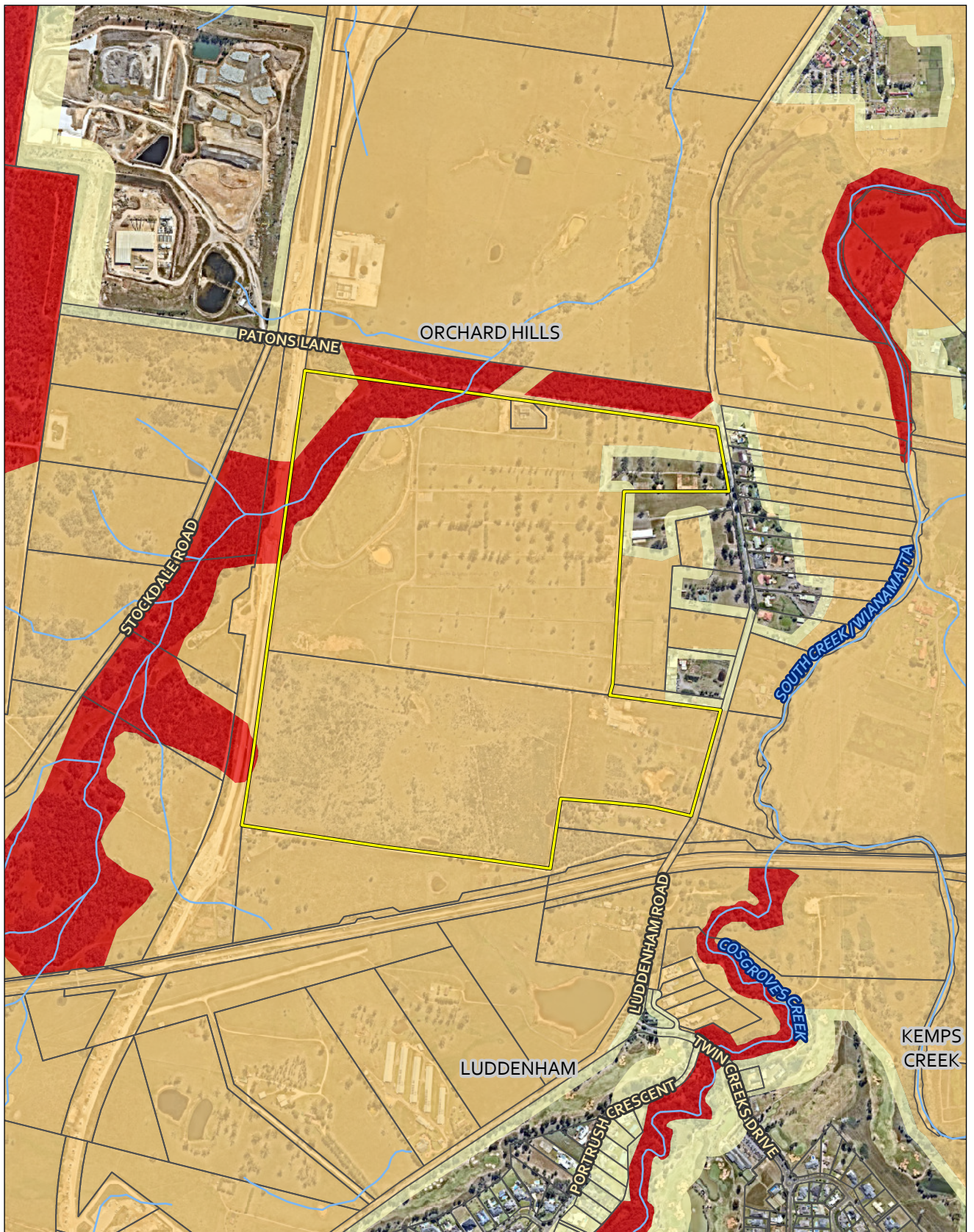
The purpose of bushfire prone land mapping is to identify lands that may be subject to bushfire risk based simply of the presence of vegetation that could act as a hazard. The maps are a planning tool used to trigger further detailed assessment. They do not present a scalable measure of hazard, threat or risk. These parameters are to be determined under further assessment in accordance with PBP (i.e. this Bushfire Assessment Report).

The bushfire prone land mapping presented in Figure 4 identifies the presence of bushfire prone vegetation throughout the AIBP and surrounding lands. Any development proposal within a lot containing mapped bushfire prone land (i.e. bushfire prone property) is to comply with the requirements of PBP.







The maps are produced at a broad scale by desk-top Geographic Information Systems (GIS) covering an entire Local Government Area (LGA). They are often conservative and are designed to identify any potential bushfire threat of all levels. The identification of hazards is discussed in the following Section 3.

Most importantly, the identification of bushfire prone land does not preclude development. The maps are not prescriptive and simply trigger further detailed assessment.





### Legend

- |  |   |
|--|---|
|  Watercourse  | <b>Bushfire Prone Land</b>  |
|  Subject Land |  Vegetation Category 1 |
|  Cadastre     |  Vegetation Category 2 |
|  |  Vegetation Buffer     |



Date: 1/05/2024

0 100 200 400  
Metres

**Figure 4: Bushfire Prone Land**

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap



## 3 Bushfire hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as APZ location and dimension. This section provides a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire hazard that may affect bushfire behaviour.

The hazard assessment was undertaken in accordance with PBP site assessment methodology. The subject land and bushfire hazards were inspected on 2<sup>nd</sup> June 2020. Photographs are included at Appendix A. The site assessment was complemented by desk-top assessment methods assisted by Nearmap aerial imagery, contour layer with 2 m intervals, and vegetation mapping layers available on NSW Government online spatial viewers.

### 3.1 Predominant vegetation

In accordance with PBP the predominant vegetation class has been determined for a distance of at least 140 m out from the business park. There are three vegetation structural formations as listed in Table 1 below and mapped on Figure 5.

**Table 1: Predominant vegetation classification adjacent the site**

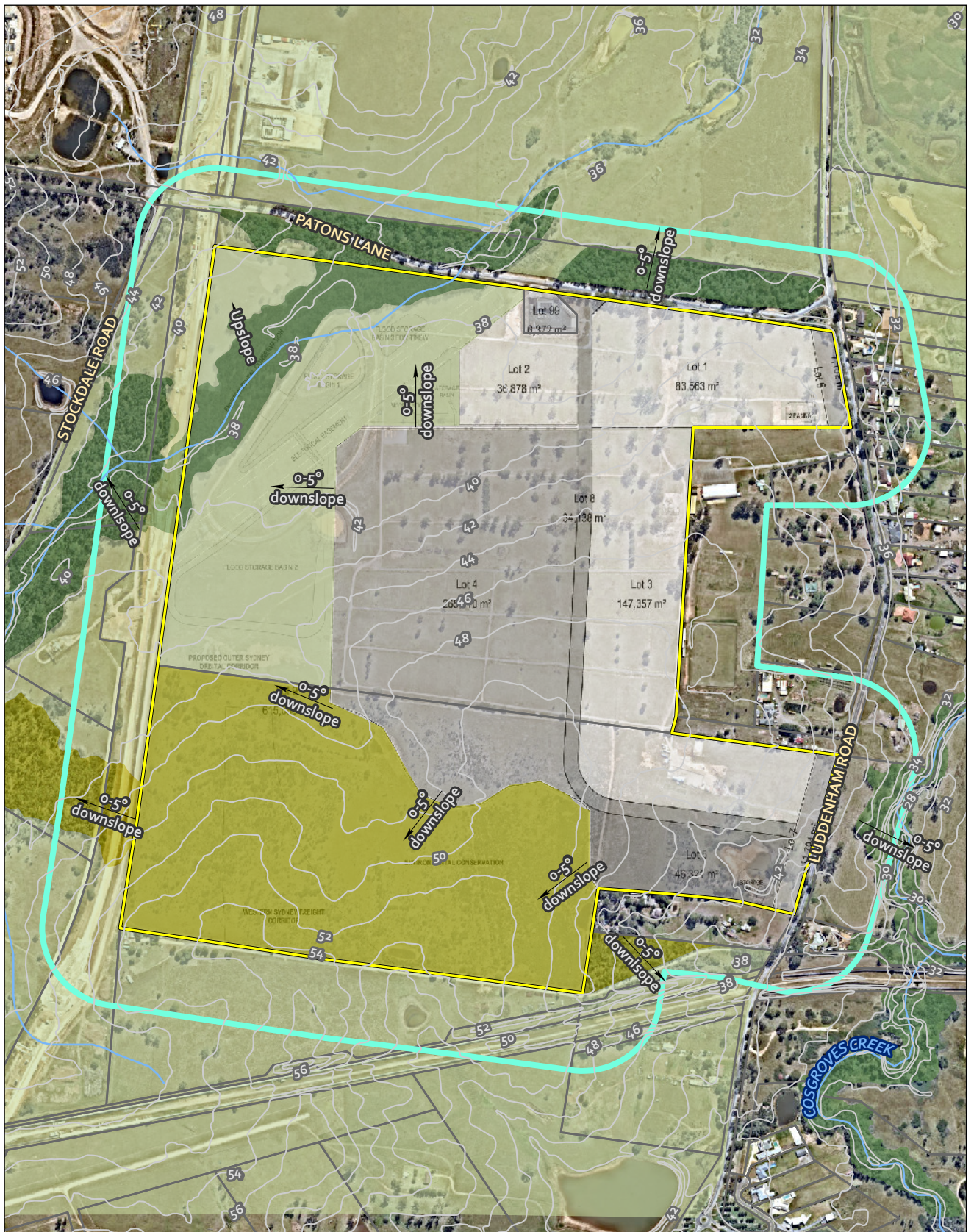
Structural formation/classification	Location
Grassland	<ul style="list-style-type: none"> <li>• Powerline easement and proposed basins to the north-west</li> <li>• Grazing land to the south</li> <li>• Outer Sydney Orbital corridor within western portion of the site</li> </ul>
Woodland	<ul style="list-style-type: none"> <li>• Conservation area in south-western portion is showing signs of regeneration and will become woodland</li> </ul>
Forest	<ul style="list-style-type: none"> <li>• Along Patons Lane to the north</li> <li>• Riparian corridor in north-west corner.</li> </ul>

### 3.2 Effective slope

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most significantly influence fire behaviour where the hazard has been identified within 100 m of the business park. The effective slope was measured from a 2 m contour layer as shown on Figure 5.

Figure 5 shows the pattern of the terrain across the immediate landscape. The predominant feature is the gentle fall in all directions in the PBP slope class of 'downslope 0-5 degrees'. The slope classes are mapped on Figure 5.





#### Legend

- Contour - 2m
- Watercourse
- Subject Land
- Cadastre
- Vegetation Assessment Area

#### Vegetation Formation

- Forest
- Woodland
- Grassland



Date: 1/05/2024

0 100 200 400  
Metres

**Figure 5: Bushfire Hazard**

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap



## 4 Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for development proposals on bush fire prone land. The measures required to be assessed for the development type proposed are listed in Table 1 below and are discussed in detail in the remainder of this section.

**Table 1: Generic PBP bushfire protection measures**

Aim & Objectives (PBP Section 1.1)	Measures
<b>Aim</b>	
<i>The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.</i>	Achieving the objectives below will satisfy the aim.
<b>Objectives</b>	
1. <i>afford buildings and their occupants protection from exposure to a bush fire;</i>	<ul style="list-style-type: none"> <li>• Building setbacks from bushfire hazards.</li> <li>• Building construction specifications or standards.</li> <li>• Defendable space - Providing fire-fighter access between buildings and the bushfire hazard.</li> </ul>
2. <i>provide for a defendable space to be located around buildings;</i>	
3. <i>provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i>	
4. <i>ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i>	<ul style="list-style-type: none"> <li>• Access to public road</li> <li>• Adequacy of internal property roads</li> <li>• Assessment of perimeter access</li> </ul>
5. <i>provide for ongoing management and maintenance of BPMs; and</i>	<ul style="list-style-type: none"> <li>• Design and layout to ensure maintenance can occur by occupants without reliance on other parties</li> </ul>

<b>Aim &amp; Objectives (PBP Section 1.1)</b>	<b>Measures</b>
6. <i>ensure that utility services are adequate to meet the needs of firefighters.</i>	<ul style="list-style-type: none"> <li>• Water supply for fire-fighting including provisions for hydrants or static water supplies.</li> <li>• Ensuring installation of electricity and gas supplies do not contribute to the risk of fire to a building.</li> </ul>

**Table 2: Specific PBP bushfire protection measures for buildings Class 5-8**

<b>Objectives (PBP Section 8.3.1)</b>	<b>Measures</b>
1. <i>Provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation.</i>	<ul style="list-style-type: none"> <li>• Access to public road</li> <li>• Adequacy of internal property roads including assessment of perimeter access</li> <li>• Defendable space - Providing fire-fighter access between buildings and the hazard</li> </ul>
2. <i>Provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development.</i>	<ul style="list-style-type: none"> <li>• Bushfire Emergency Management and Evacuation Plan</li> <li>• Adequacy of internal property roads</li> </ul>
3. <i>Provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.</i>	<ul style="list-style-type: none"> <li>• Water supply for fire-fighting including provisions for hydrants or static water supplies.</li> <li>• Ensuring installation of electricity and gas supplies do not contribute to the risk of fire to a building.</li> </ul>
4. <i>Provide for the storage of hazardous materials away from the hazard wherever possible.</i>	<ul style="list-style-type: none"> <li>• Appropriate storage of hazardous materials away from bushfire hazards.</li> </ul>

## **4.1 Access**

### **4.1.1 Public road access**

The business park will benefit from two access points: one to the north from Patons Lane, and the second to the south-east from Luddenham Road. The public roads servicing the subject land comply with PBP and provide alternate points of access for bushfire emergency response and evacuation.

### **4.1.2 Internal roads**

A public road is proposed that will form a through road providing access to all areas of the site. The road has been designed to cater for large truck movements and will therefore be suitable for fire and emergency authorities as well as evacuation if required. The road design complies with the Acceptable Solutions for roads in bushfire prone areas as per Table 5.3b of PBP.

The adequacy of property access roads within each proposed lot is to be assessed as part of each future warehouse application.

### **4.1.3 Defendable space**

For habitable development types such as dwellings, the application of a bushfire hazard building setback (i.e. APZ) is related to the vulnerability of an asset typically in terms of combustibility of external materials or the nature of the occupants. The resulting APZ dimension would stipulate a building construction standard (i.e. BAL) under Australian Standard 'AS 3959-2018 Construction of buildings in bushfire-prone areas'.

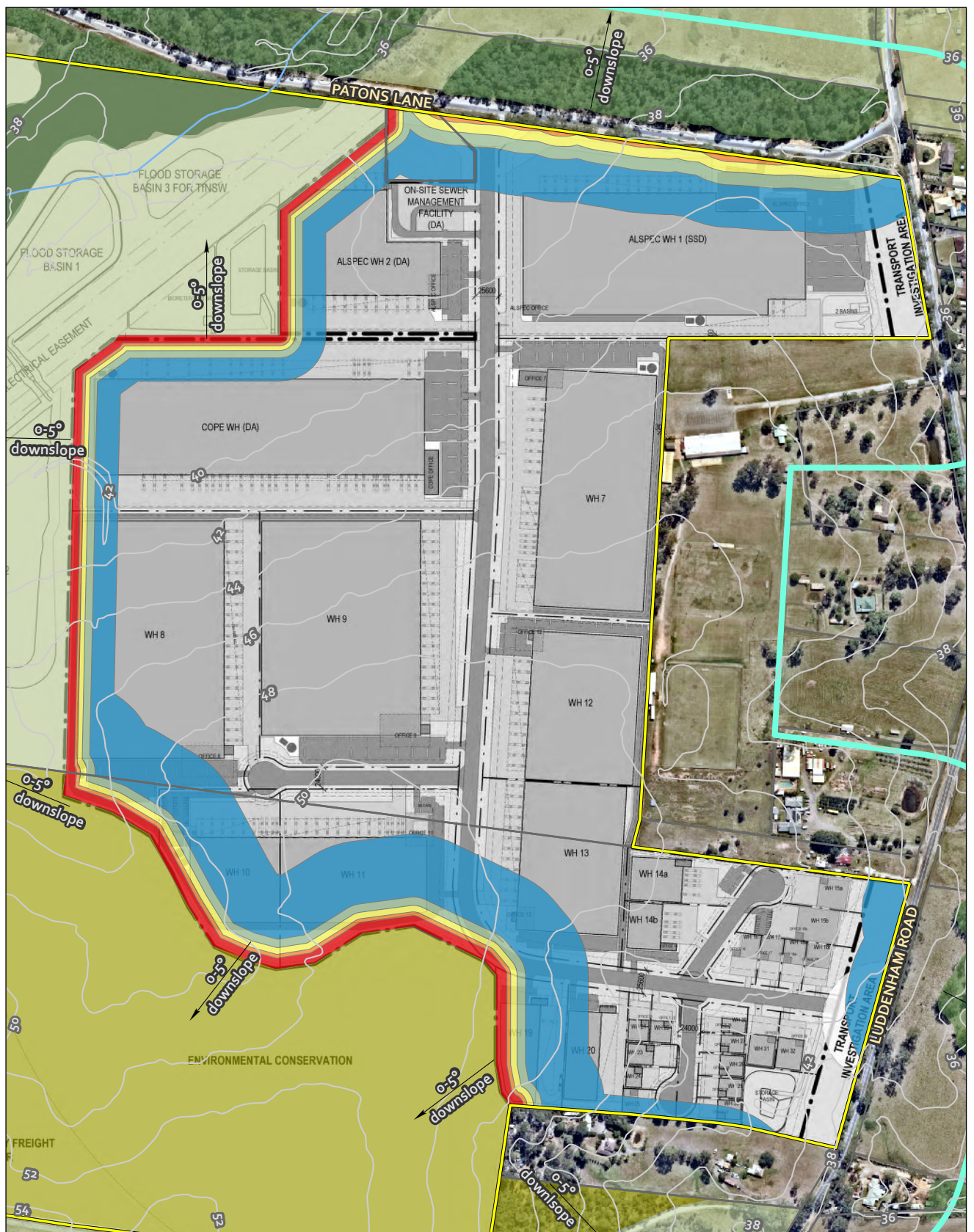
As the land use does not include a dwelling or habitable building, PBP does not prescribe an APZ dimension. The general fire safety requirements of the NCC are accepted as adequate bushfire protection for the developments involving Class 5 to 8 buildings.

However, PBP does require the consideration of a managed hazard-separation area for fire-fighting purposes referred to as 'defendable space'. A defendable space is an area between the building and the bushfire hazard that provides an environment in which fire-fighters can undertake property protection after the passage of a bushfire with some level of safety. The defendable space dimension is defined by the ability to gain access around an asset and conduct defensive fire-fighting operations. Relying on a defendable space in lieu of an APZ is deemed acceptable whereby construction satisfies NCC structural fire requirements.

A defendable space can be provided to future warehouses where situated directly adjacent to the bushfire hazard. The defendable space dimension may vary across the business park and will be a minimum 6 m and will accommodate vehicular thoroughfare for fire-fighting appliances. Figure 6 identifies where a specific defendable space is to be applied around future warehouses, consisting of a fire access road of minimum 6 m wide.

The defendable space will allow continuous thoroughfare around the perimeter of the business park ensuring fire-fighters can gain access to conduct property defence if required. The defendable space is also required to ensure fire-fighters can access all sides of the buildings for structural fire control.





Legend

- Contour - 2m
- Watercourse
- Subject Land
- Cadastral
- Vegetation Assessment Area

#### Vegetation Formation

- Forest
- Woodland
- Grassland

#### Bushfire Attack Level (BAL)

- BAL - Flame Zone
- BAL - 40
- BAL - 29
- BAL - 19
- BAL - 12.5



Date: 1/05/2024

0 50 100 200  
Metres

Figure 6: Bushfire attack Level (BAL)

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap

## 4.2 Construction standards

As introduced in Section 1.3, building construction provisions for bushfire protection within Australian Standard 'AS 3959-2018 Construction of buildings in bushfire-prone areas' (AS 3959) do not apply to developments of the type proposed as a deemed-to-satisfy requirement under the NCC. Due to the type of development and compliance with NCC requirements for building and structural fire, it is generally accepted that buildings will survive bushfire attack. In addition, staff will not reside at the site and will be familiar with evacuation routes.

However, as stated within Section 8.3.1 of PBP, consideration of building construction provisions is required to satisfy the aim and objectives of PBP and the assessment of which is to be made on a case-by-case basis.

The Bushfire Attack Levels (BAL) impacting the proposal are mapped on Figure 7. Application of BALs to future warehouse is to be assessed for each application. Warehouses proximate to forest or woodland hazards may require BAL compliance.

## 4.3 Landscaping and vegetation management

Any estate-wide landscaping, such as street trees, is to be installed and maintained to achieve the performance of an Inner Protection Area (IPA) standard as described within Appendix 4 of PBP. The principles of the landscape plan with respect to IPA performance are to be based on the following:

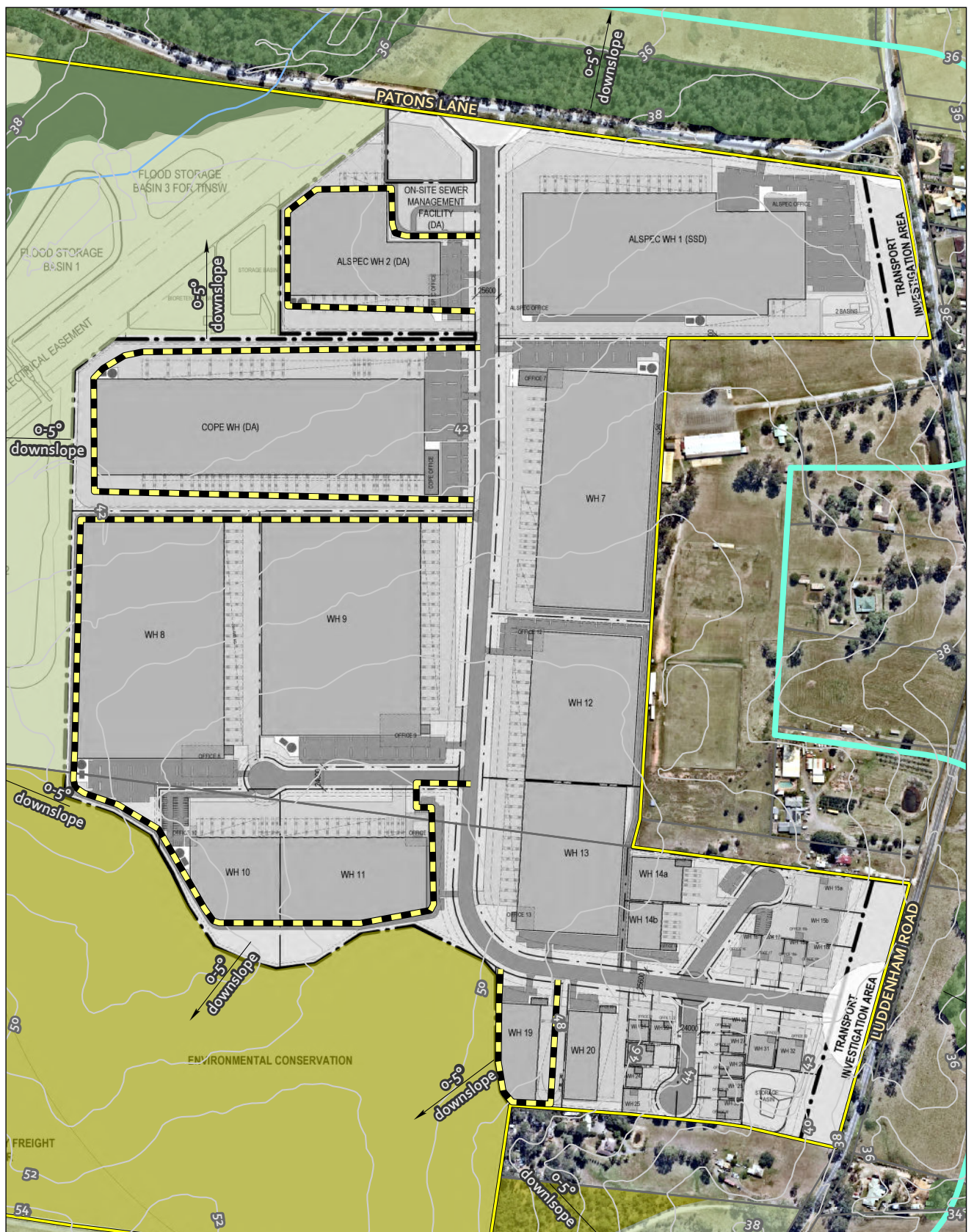
- a) Trees with canopy separation in the orientation between the lots and the hazard. Canopy separation is not required parallel to the lots and hazard.
- b) A predominance of turf (mown).
- c) Garden beds are defined, narrow, separated and spread out. Planting choice to be low-lying with an allowance for taller shrubbery for narrow, visual screening where required.

## 4.4 Emergency and evacuation

A 'Bushfire Emergency Management and Evacuation Plan' is typically prepared for facilities within bushfire prone areas depending on the level of bushfire risk. A plan is prepared in accordance with the NSW Rural Fire Service document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan' (RFS 2014).

Consideration of plan preparation is to be made for each future warehouse application.





#### Legend

- Contour - 2m
- Watercourse
- Subject Land
- Cadastral
- Vegetation Assessment Area

- Defendable Space
- Vegetation Formation**
  - Forest
  - Woodland
  - Grassland



Date: 1/05/2024

0 50 100 200  
Metres

**Figure 7: Defendable Space**

Coordinate System: GDA2020 MGA Zone 56

Imagery: © Nearmap

## **4.5 Water supply and other utilities**

### **4.5.1 Water supply**

Future warehouses will require fire hydrants to be installed to comply with *AS 2419.1 – 2021 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).

### **4.5.2 Electricity supply**

The supply of electricity will be provided underground. Compliance is therefore achieved.

### **4.5.3 Gas supply**

Any gas services are to be installed and maintained in accordance with Australian Standard *AS/NZS 1596-2014 The storage and handling of LP gas*.

## **4.6 Hazardous materials**

The storage of hazardous or combustible materials will be assessed as part of future applications for warehouse developments.



## 5 Conclusion and recommendations

The proposal consists of the subdivision of bushfire prone land for future industrial uses. The bushfire hazard consists of a mixture of grassland, woodland and forest corridors within and adjoining the site.

The proposed public road that will service the subdivision will provide an adequate and compliant level of access. A minimum 6 m wide fire access road (defendable space) is required around future warehouses that adjoin the bushfire hazard. Protection measures that require assessment for future warehouse applications are property access roads, application of BALs, bushfire evacuation plan, hydrants, and the storage of hazardous materials.

PBP requires an assessment of the proposal against the aim and objectives of PBP and the four specific objectives for buildings Class 5-8. Tables 3 and 4 below summarise how the objectives have been satisfied. This assessment concludes that all objectives are satisfied with the adoption of the recommendations listed following Tables 3 and 4.

**Table 3: Compliance with PBP aim and objectives**

Aim & Objectives (PBP Section 1.1)	Compliance statement
<b>Aim</b>	
<i>The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.</i>	Achieving the objectives below will satisfy the aim.
<i>Afford buildings and their occupants protection from exposure to a bush fire;</i>	<u>Section 4.1.3 and 4.2 demonstrates compliance.</u> Minimum 6 m wide fire access road around future warehouses located at the hazard interface and consideration of BAL application.
<i>Provide for a defendable space to be located around buildings;</i>	<u>Section 4.1.3 demonstrates compliance.</u> Minimum 6 m wide fire access road around future warehouses located at the hazard interface recommended.

<b>Aim &amp; Objectives (PBP Section 1.1)</b>	<b>Compliance statement</b>
<i>Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i>	<u>Section 4.1.3 and 4.2 demonstrates compliance.</u> Perimeter access roads and assessment of BAL application recommended for future warehouses.
<i>Ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i>	<u>Section 4.1.1 and 4.1.2 demonstrates compliance.</u> Existing public road network complies. Proposed public road complies. Minimum 6 m wide fire access road around future warehouses located at the hazard interface recommended.
<i>Provide for ongoing management and maintenance of BPMs; and</i>	<u>Section 4.3 demonstrates compliance.</u> Recommendation for compliant landscaping.
<i>Ensure that utility services are adequate to meet the needs of firefighters.</i>	<u>Section 4.5 demonstrates compliance.</u> Recommendation for compliant hydrant coverage and installation of gas supplies (if proposed) for future warehouses.

**Table 4: Compliance with PBP Section 8.3.1 objectives**

<b>Objectives (PBP Section 8.3.1)</b>	<b>Compliance statement</b>
<i>Provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation</i>	<u>Section 4.1.1 and 4.1.2 demonstrates compliance.</u> No further recommendations.
<i>Provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development</i>	<u>Section 4.4 demonstrates compliance.</u> Bushfire Emergency Management and Evacuation Plan to be considered for future warehouses.
<i>Provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building</i>	<u>Section 4.5 demonstrates compliance.</u> Recommendation for compliant hydrant coverage and installation of gas supplies (if proposed) for future warehouses.

Objectives (PBP Section 8.3.1)	Compliance statement
<i>Provide for the storage of hazardous materials away from the hazard wherever possible</i>	<u>Section 4.6 demonstrates compliance.</u> To be assessed as part of future warehouse DAs.

The following recommendations were made within this report:

1. Minimum 6 m wide fire access road is to be constructed and maintained around future warehouses where adjacent the bushfire hazard interface as indicated on Figure 6.
2. Future warehouse design and construction is to consider BAL application as mapped on Figure 6, depending on the nature of the hazard and level of threat. The BAL specifications are listed within Australian Standard 'AS 3959-2018 Construction of buildings in bushfire prone areas' and the NSW variation listed at Section 7.5 of 'Planning for Bush Fire Protection 2019'.
3. Any estate-wide landscaping, such as street trees, is to be installed and maintained to achieve the performance of an Inner Protection Area (IPA) standard as described within Appendix 4 of PBP. The principles of the landscape plan with respect to IPA performance are to be based on the following:
  - a. Trees with canopy separation in the orientation between the lots and the hazard. Canopy separation is not required parallel to the lots and hazard.
  - b. A predominance of turf (mown).
  - c. Garden beds are defined, narrow, separated and spread out. Planting choice to be low-lying with an allowance for taller shrubbery for narrow, visual screening where required.
4. Preparation of a 'Bushfire Emergency Management and Evacuation Plan' is to be considered for each future warehouse application. If prepared, a plan is to comply with the NSW Rural Fire Service document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan'.
5. Future warehouses are to have fire hydrants installed to comply with AS 2419.1 – 2005 *Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).
6. Any gas services are to be installed and maintained in accordance with AS/NZS 1596-2014 *The storage and handling of LP gas*.

In the author's professional opinion, with the adoption of the above recommendations, the proposed development will comply with *Planning for Bush Fire Protection 2019* (PBP).



David Peterson



# References

NSW Rural Fire Service (RFS). 2019. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities and Developers*. State of New South Wales through the NSW Rural Fire Service.

Standards Australia. 2014. *The storage and handling of LP Gas*, AS/NZS 1596-2014, Standards Australia International Ltd, Sydney.

Standards Australia. 2018. *Construction of buildings in bushfire-prone areas*, AS 3959, Standards Australia International Ltd, Sydney.

Standards Australia. 2021. *Fire hydrant installations - System design, installation and commissioning*, AS2419.1, Standards Australia International Ltd, Sydney.



## Appendix A - Photographs



**Photograph 1: Forest hazard to the north of Patons Lane**



**Photograph 2: Woodland hazard adjacent to the south-east**





**Photograph 3: Grassland hazard adjacent to the south of the conservation area**



**Photograph 4: Grassland hazard in Outer Sydney Orbital corridor to the west**



