



# Bushfire Hazard Assessment

90 Gindurra Road, Somersby, 2250



## Project Details

Assessed as:	Infill development
Assessed by	Matthew Noone Accreditation No. BPAD-PD 25584
Highest BAL on any facade	BAL-FZ
Project Description	Construction of internal road, construction of a hardstand area, construction of a storm water management system, construction of a noise barrier and construction of production storage bays.
Project Number	BR-75018-E



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**DISCLAIMER**

Quote from Standards Australia *"It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature of behaviour of fire, and extreme weather conditions."*

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This report reflects our opinions of bushfire risk, expected radiant heat loads and required asset protection zones relating to the proposed development. Our views are based on our interpretation of Planning for Bushfire Protection (2006), AS3959 (2009) and the methodology for site specific bushfire assessment. The Rural Fire Service have a higher authority and can upon their review, increase or reject any recommendation contained within this report. Any such recommendations made by the RFS take precedence. Our role is intermediary between our Client and the consenting authority. We apply our knowledge of the standards for bushfire protection to provide the best possible outcome for our Client, both from a bushfire safety and financial perspective. Should the RFS modify our recommendations or reject a proposal we will not be held liable for any financial losses as a result.

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## REPORT SUMMARY

Bushfire Planning and Design has been engaged to undertake a bushfire hazard assessment at 90 Gindurra Road, Somersby, 2250. The site is identified as being bushfire prone as depicted on the bushfire prone land map. The site is currently used for storage and sorting of landscape materials and a Development Application (DA) is required to increase the permitted operational area to allow the design and construction of a recycling facility.

The development consists of two stages, stage 1 involving the demolition of existing buildings and the construction of a front office and workshop, front parking areas. DA consent has been approved for stage 1. Stage 2, involves earthworks to facilitate on-site drainage, construction of on-site roads, a hardstand area, a storm water management system, a noise barrier and the construction of waste storage and product storage bays.

The site is located at 90 Gindurra Rd, Somersby (Lot4/DP227279) which is under the jurisdiction of the Central Coast Council. The land is zoned IN1 General Industrial and is accessed from Gindurra road on the northern boundary. Kangoo road borders the southern boundary. The site is currently used for storing and screening soil and sand, which is sold for landscaping. The majority of the site is bushland with approximately 14,000 m<sup>2</sup> cleared and currently used as a processing and sorting area. Bushland is located to the west of the site and to the north of Gindurra road. Managed land is located to the east and to the south of Kangoo road.

The proposed development has been assessed against the potential threat of bushfire. It is noted that the proposed works relate to the construction of four unenclosed, non habitable and non habitable structures (aggregate storage bay, landscape storage bay, waste receival bay and waste storage bay). The nominated asset protection zones relate to achieving a maximum expected radiant heat load of 29 kW/m<sup>2</sup>. This intent is achieved for the landscape storage bay and waste receival bay, however cannot be achieved for the proposed aggregate storage bay. The proposed aggregate storage bay on the north western end of the site is located within 5m of the western boundary. In the event of a bushfire, the aggregate storage bay could be exposed to flame contact however the concrete storage bays should provide some radiant heat shielding against any potential fire running from the west and south west. The proposed waste storage bay on the south eastern end of the development is located within 2m of the eastern boundary. An APZ cannot be provided to the east of this structure however the land to the east is managed and the proposed 5m high concrete block wall / acoustic barrier will provide adequate bushfire separation from the land to the east.

We recommend (where possible) that a minimum 15m APZ is provided around each proposed structure. This will provide a non vegetated buffer to prevent potential bushfire spreading onto the subject site or fire spreading from the subject site onto the adjoining allotments. The recommended APZs are achieved for all proposed structures except for the proposed aggregate storage bay. This is a concrete open structure containing non combustible aggregates. This structure and deficient APZ has zero influence with regards to bushfire behaviour or bushfire protection.

The proposed blending and processing areas are not defined by any building works. All proposed built structures are non combustible and suitably located. In the event of a bushfire it is our view that the proposed development will not influence bushfire behaviour and will not increase bushfire risk for any adjoining properties.

The nominated BAL-ratings which correspond to the Australian Standard AS3959 (The Australian Standard for the Construction of a Building in a Bushfire Prone Area) are provided for reference and can be adopted for the construction of the proposed works. The Class 7 development is not required to comply with AS3959. The general fire safety construction provisions of the NCC (2016) are taken as acceptable solutions, but the aims and objectives of PBP (2006) apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management.

We recommend that all proposed works are constructed from non combustible materials. The asset protection zones nominated in figure 1 are deemed to be adequate. Site access, including access via the public road system is suitable for emergency response vehicles. The development complies with Planning for Bushfire Protection (2006) with regards to the provision of water. The requirements for electricity and gas (if applicable) can also be complied with. We recommend that at bushfire emergency evacuation plan is prepared such that employees and visitors are informed about suitable egress routes away from the site in the event of bushfire. Compliance with the NCC (2016) via compliance with AS3959, the Australian Standard for the Construction of Buildings in Bushfire Prone Areas can also be achieved.

We trust that the information within this report is satisfactory. Should you wish to discuss any of the above, please contact the undersigned.

Regards,



Matthew Noone  
Grad.Dip. Design for Bushfire Prone Areas.  
BSc (Geology)





## SECTION 1. BACKGROUND AND BRIEFING NOTES

### 1.0 INTRODUCTION

Bushfire Planning and Design has been engaged to undertake a bushfire hazard assessment at the subject site. The site is mapped as being bushfire prone under Section 146 of the Environmental Planning and Assessment Act 1979.

The development is captured under Section 4.14 of the Environmental Planning and Assessment Act 1979; Consultation and development consent – certain bush fire prone land. For the purpose of bushfire assessment the development is considered infill development as described in the New South Wales Rural Fire Service document Planning for Bushfire Protection 2006. The site is currently used for storage and sorting of landscape materials and a Development Application is required to increase the permitted operational area to allow the design and construction of a recycling facility.

The proposed development relates to the proposed construction of internal roads, non habitable storage bays, hardstands and earth works. The development is considered to be a Class 7 development (National Construction Code (NCC 2017) Classification). Class 7 developments are not required to comply with the NCC (2017) with regards to bushfire protection and as a consequence, nor are they required to comply with AS3959. The general fire safety provisions of the NCC are deemed to be adequate. The project is required to comply with the aims and objectives of Planning for Bushfire Protection 2006 with regards to access, water and services, emergency planning and landscaping/vegetation management.

### 1.2 SITE DESCRIPTION

The site is located at 90 Gindurra Rd, Somersby (Lot4/DP227279) which is under the jurisdiction of the Central Coast Council. The land is zoned IN1 General Industrial and is accessed from Gindurra road on the northern boundary. Kangoo road borders the southern boundary. The site is currently used for storing and screening soil and sand, which is sold for landscaping. The majority of the site is bushland with approximately 14,000 m<sup>2</sup> cleared and currently used as a processing and sorting area. Bushland is located to the west of the site and to the north of Gindurra road. Managed land is located to the east and to the south of Kangoo road.

### 1.3 PURPOSE OF THE REPORT

• Development applications on bush fire prone land must be accompanied by a Bush Fire Assessment within the Statement of Environmental Effects demonstrating the degree to which the proposed development complies with or deviates from the aims, objectives and performance criteria of Planning for Bushfire Protection 2006 (PBP 2006).

- To determine the expected fire behaviour and threat to the proposed development.
- To provide the land owner, Central Coast Council, the RFS and other relevant stakeholders with a bushfire report that determines the extent of the bushfire hazard on and surrounding the subject site.
- To identify compliance with the BCA – Building Code of Australia (Also known as NCC).
- To identify compliance with the specific objectives and performance requirements of Planning for Bushfire Protection 2006, including Appendix 3 2010 where applicable.
- To determine the required level of construction required by AS3959 – Australian Standard for the Construction of Buildings in Bushfire Prone Areas.

## 1.4 SCOPE OF THE REPORT

This report has been prepared as a requirement for a bush fire assessment to be prepared to accompany the development application for the proposed development. This report has considered all current relevant bushfire legislation, planning instruments, codes and standards for the construction of a building in a bush fire prone areas. For the purposes of this report it is necessary to describe the surrounding vegetation to 140m from the boundary and slope to 100m from the boundary. This report does not directly assess the bushfire hazard on any adjacent site and cannot be used to support a development application for any allotment other than the specific address noted in the header above.

## 1.5 METHODOLOGY

The methodology for the bushfire hazard assessment follows the method described in the Rural Fire Service publication 'Planning for Bushfire Protection' Appendix 3. These steps are as follows;

- Determine the vegetation formation types and sub-formations around the building using Appendix 2 of PBP, 2006.

(i) Identify all the vegetation types within 140 metres of the site using Keith(2004);

(ii) Classify the vegetation formations as set out in Appendix 2; and (iii) Convert Keith to Specht.

Note: AS3959-2009 as referenced in the BCA-2017 uses AUSLIG (1990) vegetation classifications while PBP uses Keith.

- Determine the distance between each vegetation formation identified (from the edge of the foliage cover) and the building.
- Determine the effective slope of the ground for each vegetation group.
- Determine the relevant FDI (Fire Danger Index) for the council area in which the development is to take place.
- Match the relevant FDI, appropriate vegetation, distance and effective slope classes to determine the bush fire attack levels using method 1 of AS3959-2009.
- Where a more detailed analysis is required, method 2 of AS3959-2009 will be employed.

## 1.6 REGULATORY FRAMEWORK

The main legislation, planning instruments, development controls and guidelines that are related to the development of bushfire prone land is as follows;

### 4.14 Consultation and development consent— certain bush fire prone land

*(1) Development consent cannot be granted for the carrying out of development for any purpose (other than a subdivision of land that could lawfully be used for residential or rural residential purposes or development for a special fire protection purpose) on bush fire prone land (being land for the time being recorded as bush fire prone land on a relevant map certified under section 10.3 (2)) unless the consent authority:*

*(a) is satisfied that the development conforms to the specifications and requirements of the version (as prescribed by the regulations) of the document entitled Planning for Bush Fire Protection prepared by the NSW Rural Fire Service in co-operation with the Department (or, if another document is prescribed by the Bushfire Planning & Design*

*regulations for the purposes of this paragraph, that document) that are relevant to the development (the relevant specifications and requirements), or*

*(b) has been provided with a certificate by a person who is recognised by the NSW Rural Fire Service as a qualified consultant in bush fire risk assessment stating that the development conforms to the relevant specifications and requirements.*

*(1A) If the consent authority is satisfied that the development does not conform to the relevant specifications and requirements, the consent authority may, despite subsection (1), grant consent to the carrying out of the development but only if it has consulted with the Commissioner of the NSW Rural Fire Service concerning measures to be taken with respect to the development to protect persons, property and the environment from danger that may arise from a bush fire.*

*(1B) This section does not apply to State significant development.*

*(1C) The regulations may exclude development from the application of this section subject to compliance with any requirements of the regulations. The regulations may (without limiting the requirements that may be made):*

*(a) require the issue of a certificate by the Commissioner of the NSW Rural Fire Service or other qualified person in relation to the bush fire risk of the land concerned, and*

*(b) authorise the payment of a fee for the issue of any such certificate.*

All new developments must comply with the Building Code of Australia (also known as the NCC). The BCA is a performance based code which derives its statutory power from the Environmental Planning and Assessment Act 1979. Compliance with the BCA can be achieved via a performance based solution or a deemed-to-satisfy solution. With regards to the construction of a building in a bushfire prone area, the deemed to satisfy method of compliance is achieved by complying with the Australian Standard AS3959 (2009).

There is a New South Wales variation in the BCA which excludes BAL FZ construction standards as a deemed to satisfy solution. Buildings exposed to radiant heat levels greater than 40kW/m<sup>2</sup> are considered to be in the flame zone, BAL FZ. For developments that require a BAL FZ level of construction, an alternative solution is required to be submitted. An alternative solution is one which is different to the deemed to satisfy provisions but meets the performance requirements of the BCA and the Objectives of Planning for Bushfire Protection.

The EP&A Regulation requires a Certifying Authority, prior to issuing a construction certificate or complying development certificate, to be satisfied that the relevant requirements of the BCA will be met.

## **SECTION 2. BUSHFIRE ATTACK LEVEL ASSESSMENT**

### **2.1 INTRODUCTION**

For the purpose of this bushfire assessment, the vegetation is required to be described to a distance of 140m from the boundary and the slope to 100m from boundary. Vegetation type and slope under vegetation are the factors that will significantly affect bushfire behaviour.

‘Research has shown that 85% of houses are lost in the first 100m from bushland and that ember attack is a significant form of attack on properties’ (RFS 2006).



We note that with the exception of the processing shed, admin office and amenities building which has already had development consent, all other proposed structures relating to this development are open non combustible, non habitable storage bays which will be utilized for the storage and recycling of building and landscaping materials.

## 2.2 EXECUTIVE SUMMARY

To clarify our findings, the vegetation within 100m of the site which could significantly influence bushfire behaviour is Hawkesbury Banksia Scrub and Hawkesbury Woodland. The northern part of the site has been part cleared (approximately 14,000m<sup>2</sup>) for its current land usage approved under a separate development application. Disturbed canopy, bare ground and patches of vegetation and regrowth are distributed around the northern part of the site (refer site photos in appendix). The proposed development will extend the existing facility towards the south.

The vegetation to the south of the proposed works is a combination of Hawkesbury Banksia Scrub and Hawkesbury Woodland (Gosford Council vegetation mapping). The land to the west of the proposed works is dominantly Hawkesbury Banksia Scrub and the land to the east is dominantly managed land.

The effective slope is 0-5° down-slope the west, east and south and up-slope to the north.

### Proposed aggregate storage bay.

The proposed aggregate storage bay is located within 3m of the northern boundary however there is at least 11m separation to the Scrub on the northern side of Gindurra Road. Being within 5m of the western boundary, in the event of a bushfire, the aggregate storage bay could be exposed to radiant heat loads greater than 40 kW/m<sup>2</sup> (ie. BAL-FZ). The APZ recommendations are provided as a guideline to achieving a nominated expected radiant heat load. There is insufficient space to the west of the proposed aggregate storage bay to provide an APZ. This in our view doesn't matter. The proposed aggregate storage bay is a concrete open structure containing non combustible aggregates. The proposed structure and deficient APZ will have no influence on bushfire behaviour.

### Proposed aggregate storage bay

	NORTH (NE)	SOUTH (SW)	EAST	WEST
Effective slope (slope under vegetation)	U-S	0-5° D-S	0-5° D-S	0-5° D-S
Site Slope	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Vegetation classification AS3959	Scrub (Hawkesbury Banksia Scrub)	Woodland & Scrub	Scrub (Hawkesbury Banksia Scrub)	Scrub (Hawkesbury Banksia Scrub)
Separation distance	> 11m	> 50m	> 40m	< 5m
Assessed BAL-Rating	BAL-40	BAL-40	BAL-29	BAL-FZ
Recommended APZ	11m (AS3959)	15m	15m	15m

**Proposed landscape storage bay.**

The proposed landscape storage bay has greater than 15m separation in all directions (with APZ management) and yields a maximum expected radiant heat load less than 29 kW/m<sup>2</sup> ( ie. BAL-29). The land to the north and south of the landscape storage bay has a disturbed canopy. After the establishment of the APZs for each processing bay there will be at least 70m of managed land to the north east and south west of this storage bay.

**Proposed landscaping storage bay**

	NORTH (NE)	SOUTH (SW)	EAST	WEST
Effective slope (slope under vegetation)	U-S	0-5° D-S	0-5° D-S	0-5° D-S
Site Slope	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Vegetation classification AS3959	Scrub (Hawkesbury Banksia Scrub)	Woodland & Scrub	Scrub (Hawkesbury Banksia Scrub)	Scrub (Hawkesbury Banksia Scrub)
Separation distance	> 70m	> 100m	> 19m	19m
Assessed BAL-Rating	BAL-29	BAL-29	BAL-29	BAL-29
Recommended APZ	15m	15m	15m	15m

**Proposed waste receival storage bay.**

The proposed waste receival storage bay is located 13m from the eastern boundary. The land to the east of the boundary is managed land. A small parcel of woodland is located between this processing bay and the eastern boundary. Hawkesbury Woodland and a thin band of Hawkesbury Banksia Scrub is located to the south. After the establishment of the APZs for each processing bay there will be approximately 100m of managed land to the north east and at least 60m to the south west of this processing bay. The maximum expected radiant heat load less than 29 kW/m<sup>2</sup> ( ie. BAL-29).

**Proposed waste receival storage bay**

	NORTH (NE)	SOUTH (SW)	EAST	WEST
Effective slope	U-S	0-5° D-S	0-5° D-S	0-5° D-S
Site Slope	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Vegetation classification AS3959	Scrub (Hawkesbury Banksia Scrub)	Woodland & Scrub	Managed Land	Scrub (Hawkesbury Banksia Scrub)
Separation distance	> 100m	> 60m	12m	> 34m
Assessed BAL-Rating	BAL-29	BAL-29	BAL-29	BAL-29
Recommended APZ	15m	15m	15m	11m

**Proposed waste storage bay**

The proposed waste storage bay is located within 2m of the eastern boundary. The land to the east is managed. We note that a 5m high concrete block wall / acoustic barrier is located on the eastern boundary which will mitigate any potential grass fire spreading onto the site. A 37m wide APZ can be provided to the west of this storage bay. Hawkesbury Woodland is located to the south. The waste storage bay is bound by a concrete block wall on three sides (south, east and west).

After the establishment of the APZs and in the event of a bushfire, the maximum predicted expected radiant heat load for any part of the storage bay is less than 29 kW/m<sup>2</sup> ( ie. BAL-29).

<b>Proposed waste storage bay</b>				
	NORTH (NE)	SOUTH (SW)	EAST	WEST
Effective slope	U-S	0-5° D-S	0-5° D-S	0-5° D-S
Site Slope	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Vegetation classification AS3959	Scrub (Hawkesbury Banksia Scrub)	Woodland & Scrub	Managed Land	Scrub (Hawkesbury Banksia Scrub)
Separation distance	> 100m	> 15m	> 15m	37m
Assessed BAL-Rating	BAL-29	BAL-29	BAL-29	BAL-29
Recommended APZ	15m	15m	15m	15m

#### **Proposed blending area and proposed waste processing area.**

Both of these areas (refer page 11 for location) are open spaces with no building structures. Mobile plant and equipment, grinders, crushers etc. will be used in this location. The proposed blending area will have a 3m high non combustible noise barrier (wall) to the east. The protection of machinery is not addressed in any legislative context with regards to bushfire protection.



**Figure 1a - VEGETATION & SLOPES - 90 GINDURRA ROAD**Date of issue  
12-Jul-18

Aerial view modified from Near Map (www.nearmap.com)

**LEGEND**

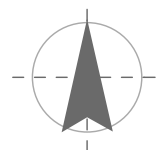
Hawkesbury woodland	BAL-FZ Zone	BAL-19 Zone
Banksia Scrub	BAL-40 Zone	BAL-12.5 Zone
Residential Land	BAL-29 Zone	Hydrant

**ABBREVIATIONS**

BAL - BUSHFIRE ATTACK LEVEL  
D-S - DOWN SLOPE  
U-S - UP SLOPE  
P1 - PHOTO 1

DRAWING SCALE

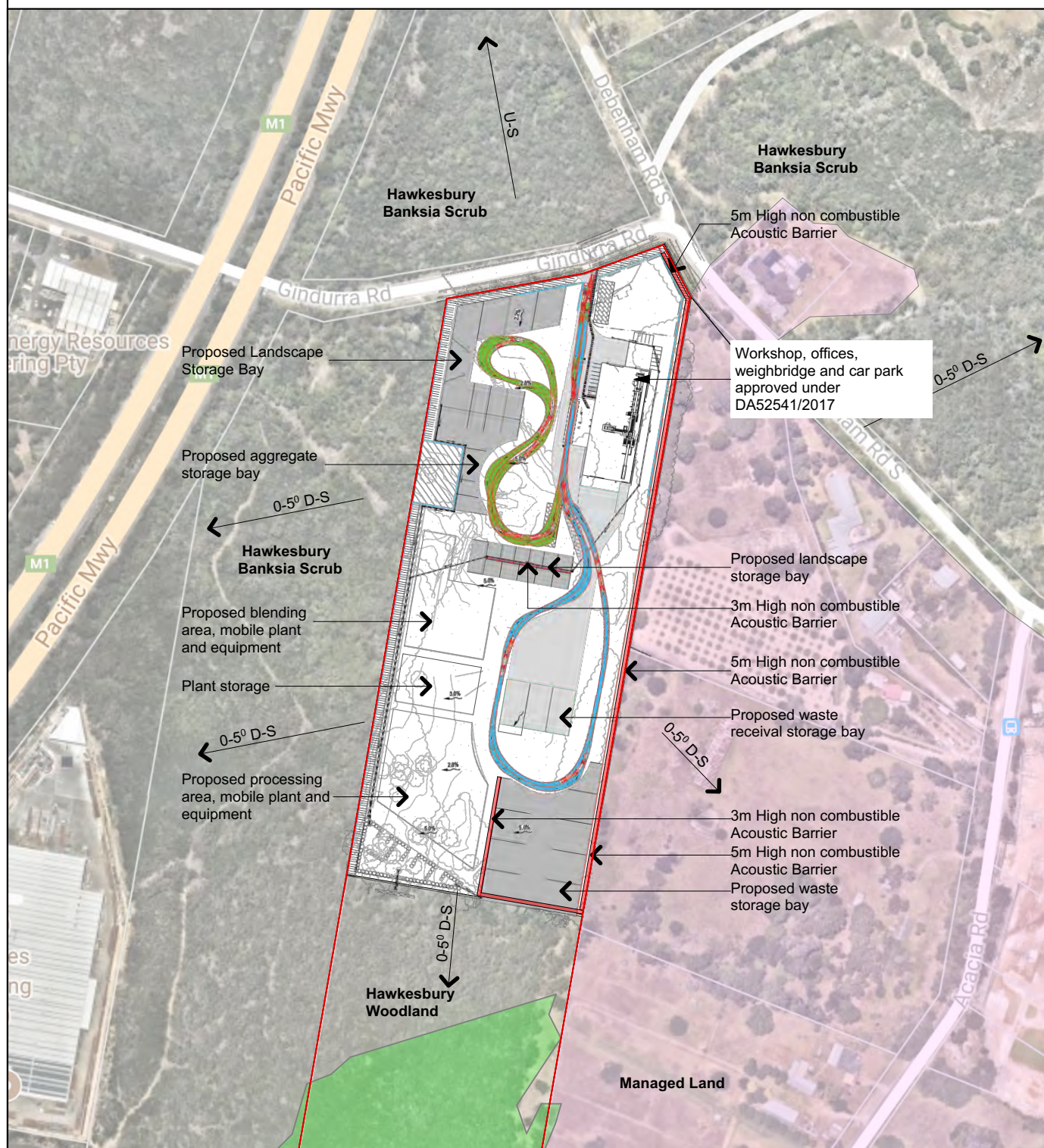
1:2500



**NORTH POINT****BUSHFIRE PLANNING AND DESIGN - 0406077222**



**Figure 1b - SITE ANALYSIS DRAWING - 90 GINDURRA ROAD**Date of issue  
14-Jan-19

Aerial view modified from Near Map (www.nearmap.com)

**LEGEND**

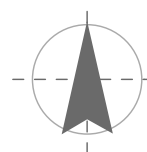
 Hawkesbury woodland	 BAL-FZ Zone	 BAL-19 Zone
 Banksia Scrub	 BAL-40 Zone	 BAL-12.5 Zone
 Residential Land	 BAL-29 Zone	 Hydrant

**ABBREVIATIONS**

BAL - BUSHFIRE ATTACK LEVEL  
D-S - DOWN SLOPE  
U-S - UP SLOPE  
P1 - PHOTO 1

**DRAWING SCALE**

1:1500

**NORTH POINT****BUSHFIRE PLANNING AND DESIGN - 0406077222**



### SECTION 3. PBP 2006 SPECIFIC OBJECTIVES (INFILL)

The following tables indicate the extent to which the proposed development complies with or deviates from Planning for Bushfire Protection 2006.

<b>ENSURE THAT THE BUSH FIRE RISK TO ADJOINING LANDS IS NOT INCREASED.</b>	<b>ACCEPTABLE SOLUTION</b>
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<b>PROVIDE A MINIMUM DEFENDABLE SPACE.</b>	<b>ACCEPTABLE SOLUTION</b>
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<b>PROVIDE BETTER BUSH FIRE PROTECTION ON A RE-DEVELOPMENT SITE, THAN THE EXISTING SITUATION. THIS SHOULD NOT RESULT IN NEW WORKS BEING EXPOSED TO GREATER RISK THAN AN EXISTING BUILDING</b>	<b>ACCEPTABLE SOLUTION</b>
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<b>ENSURE THAT THE BUSH FIRE RISK TO ADJOINING LANDS IS NOT INCREASED.</b>	<b>ACCEPTABLE SOLUTION</b>
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<b>ENSURE THAT THE FOOTPRINT OF THE PROPOSED BUILDING DOES NOT EXTEND TOWARDS THE HAZARD BEYOND EXISTING BUILDING LINES ON NEIGHBOURING LAND.</b>	<b>ACCEPTABLE SOLUTION</b>
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<b>DEVELOPMENTS ARE NOT TO RESULT IN AN INCREASED BUSH FIRE MANAGEMENT AND MAINTENANCE RESPONSIBILITY ON ADJOINING LAND OWNERS UNLESS THEY HAVE AGREED TO THE DEVELOPMENT.</b>	<b>ACCEPTABLE SOLUTION</b>
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<b>ENSURE BUILDING DESIGN AND CONSTRUCTION ENHANCES THE CHANCES OF OCCUPANT AND BUILDING SURVIVAL.</b>	<b>ACCEPTABLE SOLUTION</b>
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### SECTION 4. CONSTRUCTION REQUIREMENTS

PERFORMANCE CRITERIA (PBP 2006)	ACCEPTABLE SOLUTION
<p>It must be demonstrated that a proposed building can withstand bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. The construction requirements have been determined in accordance with Planning for Bushfire Protection Appendix 3 and the requirements for attached garages and others structures in Section 4.3.5 (PBP 2006). It is noted that Class 7 developments are not required to comply with the deemed to satisfy provisions of the NCC (NCC 2017, G5.2). The general fire safety construction provisions are taken as acceptable solutions, but the aims and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management.</p> <p>The building requirements for the specified BAL-rating will mitigate bush fire attack in the form of wind, smoke, embers, radiant heat and flame contact. The following specifications are to be used as a guide. For the full specification please refer to the Australian Standard AS3959 and Planning for Bushfire Protection Appendix 3 2010.</p>	

## BAL-40 AS3959-2009 - CONSTRUCTION REQUIREMENTS

The specification below is a summary from AS3959-2009. Bushfire Planning and Design provides this document as an aid however strongly advises that this document is not a substitute for AS3959-2009. To the best of our knowledge the information below is an accurate representation of AS3959 however Bushfire Planning and Design accepts no liability for any inaccuracy which may have occurred during translation.

Clause	Element	Specification - derived from AS3959-2009
8.1		No gaps greater than 3mm. Any element requiring a screen must have an aperture <2mm and to be corrosion resistant steel or bronze.
8.2	Sub Floor Supports - posts, columns, piers, poles	No requirement if enclosed by a compliant wall or mesh screen that complies with 8.4. If unenclosed the sub floor supports, posts columns and piers must be:  - Non combustible <u>or</u> an AS1530.8.1 tested system.
8.3	Elevated floors	No requirement for bearers, joists and flooring if enclosed by a wall or mesh screen that complies with 8.4. If unenclosed, bearers, joists and flooring must be:  - Non combustible <u>or</u> an AS1530.8.1 tested system. - If combustible materials are used they must be lined with metal or fibre cement sheeting.
8.4	External Walls	90mm min thick masonry or masonry veneer, stone or, concrete (insitu, aerated) or, clay brick. Sarking - non combustible or breather membrane flammability index <5. Must be sarked on the outside of the frame. No joints greater than 3mm permitted. Vents and weepholes to be screened with steel, bronze or aluminium  Timber or metal stud clad externally with steel sheet <u>or</u> 9mm FC <u>or</u> an AS1530.8.1 tested system. In all cases sarking is required to the external face of stud.
8.5	External Windows	If a compliant bushfire shutter is used then no requirement for window <u>or</u> Window framing and hardware is to be metal. Glazing to be 6mm toughened. Seals to have a flammability index <5 or be silicone. Screen entire window opening externally.
8.5.3, 8.5.4 , 8.5.5	External Doors	If a compliant bushfire shutter is used then no requirement for door <u>or</u> Doors to be non combustible <u>or</u> Solid core timber 35mm thick & protected externally with a metal sheet or screen for the first 400mm above the threshold. Fully framed glazed door where frame is non combustible. Screen first 400mm above threshold. Sliding doors - glazing to be 6mm toughened glass and both fixed and openable panel to be screened. Glazing to be 6mm thick toughened glass. Door framing to be metal. Draught excluders must be installed to the base of the door.
8.6	Roofs	Non combustible including penetrations. Tiled roof to be sarked - battens allowed above sarking. Overhead glazing to have a Fire Resistance Level (FRL) of <u>/30/</u> . Verandah, carport and awning roofs connected to main building must meet all criteria of the main roof. Gables to comply with 8.4 Fascias and bargeboard to comply with AS1530.8.1. Eaves linings are to be 6mm FC <u>or</u> 6mm Calcium silicate sheet. Plastic or timber storm moulds can be used. Downpipes no requirement. Gutters to be metal. Box gutters to be non combustible. No requirement for leaf guards but if installed must be non combustible.
8.7	Verandahs & Decks	Decking shall not be spaced. No requirement for framing and supports if enclosed with a compliant screen or a wall that complies with 8.4 Spaced decking not permitted. Decking, treads and ramps to be non combustible <u>or</u> an AS1530.8.1 tested system. If unenclosed, supports and framing to be non combustible or an AS1530.8.1 tested system.  Balustrades and handrails within 125mm of the building to be non combustible - no requirement if greater than 125mm from glazing or a non combustible surface.
8.8	Water & Gas	Above ground water and gas pipes to be metal.

## BAL-29 AS3959-2009 - CONSTRUCTION REQUIREMENTS

Note the specification below includes the additional construction requirements Planning for Bushfire Protection Appendix 3 2010. The specification below is a summary from AS3959-2009. Bushfire Planning and Design provides this document as an aid however strongly advises that this document is not a substitute for AS3959-2009. To the best of our knowledge the information below is an accurate representation of AS3959 however Bushfire Planning and Design accepts no liability for any inaccuracy which may have occurred during translation.

Clause	Element	Specification - derived from AS3959-2009
7.1		No gaps greater than 3mm. Any element requiring a screen must have an aperture <2mm and to be corrosion resistant steel or bronze or aluminium.
7.2	Sub Floor Supports - posts, columns, piers, poles	No requirement if enclosed by a compliant wall or mesh screen that complies with 7.4. If unenclosed the sub floor supports, posts columns and piers must be:  - Non combustible <u>or</u> Bushfire-resisting timber (appendix F) <u>or</u> an AS1530.8.1 tested system
7.3	Elevated floors	No requirement for bearers, joists and flooring if enclosed by a wall or mesh screen that complies with 7.4. Element. If unenclosed and less than 400mm above finished ground, bearers, joists and flooring must be: - Non combustible <u>or</u> Bushfire-resisting timber (appendix F) <u>or</u> an AS1530.8.1 tested system. - Flooring can be non combustible, Appendix F timber as above, particle board or plywood if lined with sarking or mineral wool insulation.
7.4	External Walls	90mm min thick masonry or masonry veneer, stone or, concrete (insitu, aerated) or, mudbrick. Sarking - non combustible or breather membrane flammability index <5. Must be sarked on the outside of the frame. No joints greater than 3mm permitted. Vents and weepholes to be screened with steel, bronze or aluminium  Timber or metal stud clad externally with steel sheet <u>or</u> 6mm FC <u>or</u> bushfire resisting timber (appendix F). In all cases sarking is required to the external face of stud.
7.5	External Windows	If Bushfire shutter is used (metal or bushfire resisting timber - Appendix F) then no requirement for window <u>or</u> Window framing to be metal or bushfire resisting timber or metal reinforced PVC-U. Glazing to be 5mm toughened. Hardware to be metal & seals to have a flammability index <5 or be silicone. Screen openable portion of window internally or externally. Glazing less than 400mm from a horizontal surface must be screened for at least 400mm above that surface.
7.5.3, 7.5.4, 7.5.5	External Doors	If Bushfire shutter is used (metal or bushfire resisting timber - Appendix F) then no requirement for door <u>or</u> Doors to be non combustible or bushfire resisting timber (Appendix F) Solid core timber 35mm thick & protected externally with a metal sheet or screen for the first 400mm above the threshold. Fully framed glazed door where frame is non combustible. Screen first 400mm above threshold. Sliding doors - screening not required. All other door types to be screened. Glazing to be 6mm thick toughened glass Door framing to be metal or bushfire resisting timber or metal reinforced PVC-U/. Draught excluders must be installed at the base of the door. Refer to the standard for garage doors.
7.6	Roofs	Non combustible including penetrations. Tiled roof to be sarked - battens allowed above sarking. Overhead glazing to be Grade A safety glass AS1288. Verandah, carport and awning roofs connected to main building must meet all criteria of the main roof. Gables to comply with 7.6. Fascia & bargeboards to comply with AS1530.8.1 or be a bushfire resisting timber or be metal fixed at 450mm c/c. Eaves linings to be 4.5mm fc sheet or a bushfire resisting timber. Downpipes no requirement. Gutters to be metal or PVCu. Box gutters to be non combustible. No requirement for leaf guards but if installed must be non combustible.
7.7	Verandahs & Decks	No requirement for framing and supports if enclosed with a compliant screen or a wall that complies with 7.4. Decking to be spaced. Decking, treads and ramps to be non combustible or bushfire resisting timber (appendix F)  Supports and framing to be non combustible or an AS1530.8.1 tested system or a bushfire resisting timber (Appendix F).  Balustrades and handrails within 125mm of the building to be non combustible - no requirement if greater than 125mm.
7.8	Water & Gas	Above ground water and gas pipes to be metal.

## SECTION 5. ASSET PROTECTION ZONE (APZ) REQUIREMENTS

### PERFORMANCE CRITERIA (PBP 2006)

Intent of measures: to provide sufficient space and maintain reduced fuel loads, so as to ensure radiant heat levels at buildings are below critical limits and to prevent direct flame contact with a building.

- A defensible space is to be provided within the boundary of the site.
- An asset protection zone is provided and maintained for the life of the development.

The asset protection zones (APZ) requirements have been derived from the methodology of Appendix 2 of Planning for Bushfire Protection 2006. Asset protection zones and in particular the Inner Asset Protection Zones are critical for providing defensible space and reducing flame length and rate of spread (PBP 2006). APZs are designed to provide sufficient open space for emergency workers to operate and for occupants to egress the site safely. They are divided into Inner Asset Protection Areas (IPAs) and Outer Asset Protection Areas (OPAs) and are required to be maintained for the life of the development. The IPA provides for defensible space and a reduction of radiant heat levels at the building line and the OPA provides for the reduction of the rate of spread and filtering of embers. The required Asset Protection Zones are identified in table 5 below.

TABLE 5.0				
	NORTH	SOUTH	EAST	WEST
REQUIRED APZ	15m	15m	15m	15m
ACHIEVED APZ	> 15m	> 15m	> 15m	> 15m

Based on woodland (and scrub) with a maximum 0-5° down-slope, a minimum 15m APZ is recommended to be applied around each proposed structure. We note that the proposed development relates to non habitable open storage bays. The intent of providing APZs for the various storage bays is to provide a non vegetated buffer to prevent fire spreading from the subject site onto adjoining bushland and vice versa. The recommended APZs are achieved for all proposed structures except for the proposed aggregate storage bay on the north western end of the site. This is a concrete open structure containing non combustible aggregates. The structure and deficient APZ has no influence on bushfire behaviour. The following points are to be adhered to for providing APZs.

- The Inner Asset Protection Area (IPA) is to have a tree canopy cover less than 15%.
- The Outer Asset Protection Area (OPA) is to have a tree canopy cover less than 30%.
- No trees are to be located within 2m of the building roof line.
- Garden beds with flammable shrubs are to be located a minimum 10m from the building.
- Tree limbs within 2m of the ground are to be removed.
- Removal of ground fuels should be removed each year prior to the bushfire season (October-March).

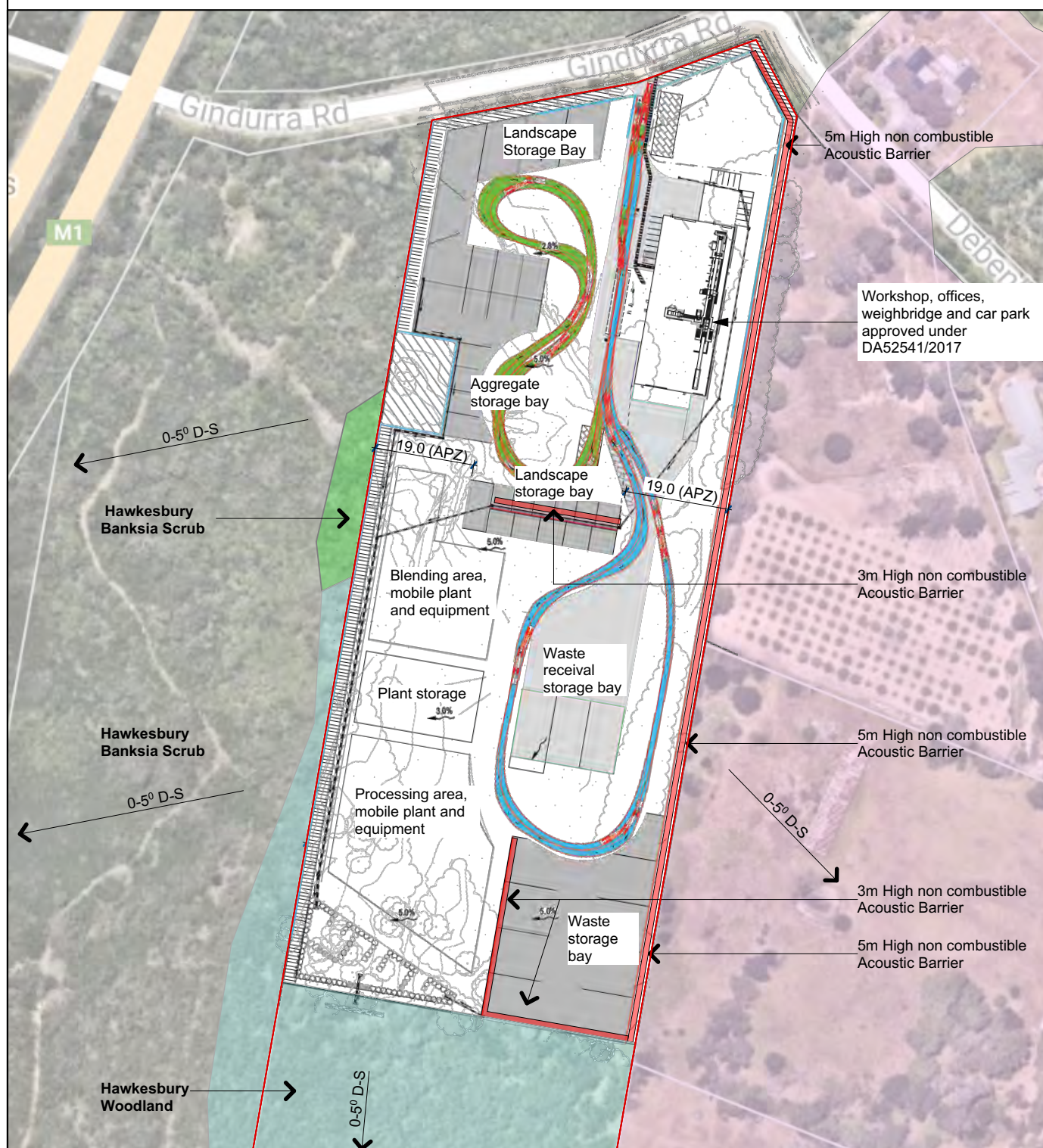
Refer to the Rural Fire Service document “Standards for Asset Protection” for information, methods etc for creating and maintaining asset protection zones. Extracts from this document have been attached to the appendix of this report.

ADDITIONAL COMMENTS IN RELATION TO ASSET PROTECTION ZONES	ACCEPTABLE SOLUTION
The proposed development can comply with PBP (2006).	



**Figure 1c - PROPOSED APZs - 90 GINDURRA ROAD**Date of issue  
20-Dec-18

Aerial view modified from Near Map (www.nearmap.com)

**LEGEND**

Hawkesbury woodland	BAL-FZ Zone	BAL-19 Zone
Banksia Scrub	BAL-40 Zone	BAL-12.5 Zone
Residential Land	BAL-29 Zone	Hydrant

**ABBREVIATIONS**

BAL - BUSHFIRE ATTACK LEVEL  
D-S - DOWN SLOPE  
U-S - UP SLOPE  
P1 - PHOTO 1

**DRAWING SCALE**

1:1000

**NORTH POINT****BUSHFIRE PLANNING AND DESIGN - 0406077222**



## SECTION 6. ACCESS REQUIREMENTS

### PERFORMANCE CRITERIA (PBP 2006)

Intent of measures: to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupants faced with evacuation.

Safe, operational access is to be provided (and maintained) for emergency services personnel in suppressing a bush fire while residents are seeking to relocate, in advance of a bush fire, (satisfying the intent and performance criteria for access roads in sections 4.1.3 and 4.2.7 as defined in Planning for Bushfire Protection 2006).

### PUBLIC ROADS - SPECIFIC REQUIREMENTS

No specific public road requirements. The public road system is deemed to be adequate.

### PROPERTY ACCESS - SPECIFIC REQUIREMENTS

The following criteria are to be applied to the proposed access onto and inside the site.

- Minimum carriageway width of 4.5m (one way) or 8m (two way).
- Minimum vertical clearance of 4m to any overhanging obstructions.
- Curves have a minimum 6m inner radius.
- Minimum 6m between inner and outer curves.
- Crossfall is not more than 10°.
- Maximum grades for sealed roads is 15°.
- Maximum grades for unsealed roads is 10°.
- Some short constrictions in the access may be accepted where they are not less than 3.5m and extend for no more than 30m
- For internal roads: roads are to be through roads. Maximum length of a dead end roads is 100m in from a through road. Dead end roads to be clearly sign posted.
- For internal roads: provide a minimum 12m outer radius turning circle for dead end roads.

### ADDITIONAL COMMENTS IN RELATION TO ACCESS

### ACCEPTABLE SOLUTION

No additional comments. The proposed development can comply with PBP (2006).

## SECTION 7. SERVICES REQUIREMENTS - WATER

### PERFORMANCE CRITERIA (PBP 2006)

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building

- Adequate water and electricity services are to be provided for fire fighting operations.

**WATER - SPECIFIC REQUIREMENTS**

The proposed development can comply with the PBP (2006) with regards to water requirements.

Reticulated water is provided however the hydrant sizing, spacing or pressures have not been tested. Fire hydrant spacing, sizing and pressures comply with the Australian Standard AS 2419.1. It is assumed that reticulated water services installed by Central Coast Council (Gosford City Council) have been installed in accordance with the Australian Standard. No additional water for the suppression of bushfire is required for the proposed development. The following points are to be adhered to for the life of the development.

- All above ground water and gas service pipes and fittings external to the building are metal.

**ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF WATER****ACCEPTABLE SOLUTION**

The proposed development can comply with PBP (2006).

**SECTION 8. SERVICES REQUIREMENTS - ELECTRICITY & GAS****PERFORMANCE CRITERIA (PBP 2006)**

Intent of measures: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building

- Gas and electricity services are to be located so as not to contribute to the risk of fire to a building.

**ELECTRICITY AND GAS - SPECIFIC REQUIREMENTS**

The proposed development can comply with the PBP (2006) with regards to electricity and gas requirements. The following points are to be adhered to (where applicable) for the provision of electricity and gas services where applicable.

**ELECTRICITY REQUIREMENTS**

- Where practicable place electrical transmission lines are underground or,
- If overhead electrical transmission lines are proposed:- lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).

**GAS REQUIREMENTS**

- Reticulated or bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities.
- Metal piping is to be used.
- All fixed gas cylinders are to be kept clear of all flammable materials to a distance of 10m and shielded on the hazard side of the installation.

•	Release valves are directed away from the building and at least 2m away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are to be metal.
•	Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

ADDITIONAL COMMENTS IN RELATION TO THE PROVISION OF ELECTRICITY AND GAS.	ACCEPTABLE SOLUTION
The proposed development can comply with PBP (2006).	

## SECTION 09. LANDSCAPING AND PROPERTY MAINTENANCE

GENERAL REQUIREMENTS (PBP 2006)
It is expected that the nominated APZs will be maintained by the owner of the land as part of the development. It is accepted practice that after construction of a dwelling, gardens will be established and landscaping of the grounds will be undertaken. The following principles should be applied for the establishment of gardens and property maintenance.

GARDEN DESIGN
• Apply the principles for APZ and vegetation management as attached to the appendix of this report.
• Maintain short cropped grass less than 100mm adjacent to any building.
• Keep areas under fences, fence posts and gates and trees raked and cleared of fuel.
• Utilising non-combustible fencing and retaining walls.

MAINTENANCE
Prior to the bushfire season which runs from October to March the site should be maintained utilising the following guidelines from Appendix 5 PBP (2006).
• Remove organic material from the roof and gutters and valleys.
• Check tiles and roof lines for broken tiles or dislodged roofing materials.
• Ensure painted surfaces are in good condition with decaying timbers being given particular attention to prevent the lodging of embers within gaps.
• Doors are fitted with draught seals and well maintained.
• Mats are of non combustible material or in areas of low potential exposure.
• Screens on windows and doors are in good condition without breaks or holes in fly screen material and frames are well fitting into sills and window frames.
• Where applicable, check pumps and water supplies are available and in working order.
• Where applicable, drenching or spray systems are tested before the fire season.
• Hoses and hose reels are not perished and fittings are tight and in good order.
• Woodpiles, garden sheds and other combustible materials are located away from the house.

## SECTION 10. SYDNEY REGIONAL ENVIRONMENTAL PLAN NO.20

As per the Fire and Incident Management Study brief for the Proposed Development of Kariong Sand and Soil Supplies, the Sydney Regional Environmental Plan No.20 is required to be addressed. The Sydney Regional Environmental Plan No 20—Hawkesbury-Nepean River (No 2—1997) encompasses the Greater Metropolitan Region and includes the Gosford area.

Part 2 Clause 6(2) of the plan provides guidelines for environmentally sensitive areas. The policy relates to

*“ The environmental quality of environmentally sensitive areas must be protected and enhanced through careful control of future land use changes and through management and (where necessary) remediation of existing uses”.*

The following table provides comments on how from a bushfire perspective the development complies with the strategies identified in the plan.

Sydney Regional Environmental Plan No 20 Part 2 Clause 6.2 Strategies		Compliance
(a)	Rehabilitate parts of the riverine corridor from which sand, gravel or soil are extracted so that attached aquatic plant beds are replaced and water quality and faunal habitats improved.	Not applicable
(b)	Minimise adverse impacts on water quality, aquatic habitats, riverine vegetation and bank stability.	Not applicable
(c)	Minimise direct and indirect adverse impacts on land reserved or dedicated under the National Parks and Wildlife Act 1974 or the Forestry Act 1916 and conservation area sub-catchments in order to protect water quality and biodiversity.	Not applicable
(d)	Protect wetlands (including upland wetlands) from future development and from the impacts of land use within their catchments.	Not applicable
(e)	Consider the need to include buffer zones (such as adequate fire radiation zones) for proposals on land adjacent to land reserved or dedicated under the National Parks and Wildlife Act 1974 or the Forestry Act 1916.	Not applicable (Adjoining lands are not reserved for National Parks and Wildlife or the Forestry).
(f)	Consider the views of the Director-General of National Parks and Wildlife about proposals for land adjacent to land reserved or dedicated under the National Parks and Wildlife Act 1974.	Not applicable
(g)	Consideration should be given to the impact of the development concerned on the water table and the formation of acid sulphate soils.	Not applicable
(h)	New development in conservation area sub-catchments should be located in areas that are already cleared.	Not applicable

## SECTION 11. GLEP 2014 and GDCP 2013

### GOSFORD LOCAL ENVIRONMENTAL PLAN (GLEP) 2014.

We have reviewed the Gosford Local Environmental Plan 2014. Clause 5.11 of the plan relates to bushfire hazard reduction and states the following:

*“ Bush fire hazard reduction work authorised by the Rural Fires Act 1997 may be carried out on any land without development consent. Note. The Rural Fires Act 1997 also makes provision relating to the carrying out of development on bush fire prone land”.*

Clause 5.11 (GLEP 2014) does not affect the proposed development in any way. The land owner currently has a responsibility to manage the bush fire hazards on their property and this will continue into the future. Before undertaking bushfire hazard reduction the owner will need to obtain a bush fire hazard reduction certificate, use the 10/50 Vegetation Clearing Code of Practice or obtain a fire permit before using fire to treat a bush fire hazard the property. During the bush fire danger period a permit may also be required. With regards to lighting fires for the purpose of hazard reduction in the future it is advisable to contact the local RFS or Council.

### GOSFORD DEVELOPMENT CONTROL PLAN (GDCP) 2013.

We have reviewed the Gosford Development Plan 2013 and did not sight any clauses that relate or affect the development at 90 Gindurra Road.

## SECTION 12. RECOMMENDATIONS

Prior to the bushfire season which runs from October to March, the property should be maintained in accordance with the guidelines in Section 9.

We recommend that a bushfire emergency evacuation plan is prepared such that employees and visitors are informed about suitable egress routes away from the site in the event of bushfire.

## SECTION 13. DEVELOPMENT REQUIREMENTS

The following points are to be complied with as part of this development.

1. Comply with the construction requirements as detailed in Section 2 and Section 4.
2. Comply with the APZ requirements nominated in Section 5.
3. Comply with the provision of water, electricity and gas (where applicable) as discussed in Section 7 & 8.
4. Comply with the landscaping and property maintenance requirements in Section 9.

## SECTION 14. CONCLUSION

The proposed development has been assessed against the potential threat of bushfire. It is noted that the proposed works relate to the construction of four unenclosed, non habitable and non habitable structures (aggregate storage bay, landscape storage bay, waste receival bay and waste storage bay). The nominated asset protection zones relate to achieving a maximum expected radiant heat load of 29 kW/m<sup>2</sup>. This intent is achieved for the landscape storage bay and waste receival bay, however cannot be achieved for the



proposed aggregate storage bay. The proposed aggregate storage bay on the north western end of the site is located within 5m of the western boundary. In the event of a bushfire, the aggregate storage bay could be exposed to flame contact however the concrete storage bays should provide some radiant heat shielding against any potential fire running from the west and south west. The proposed waste storage bay on the south eastern end of the development is located within 2m of the eastern boundary. An APZ cannot be provided to the east of this structure however the land to the east is managed and the proposed 5m high concrete block wall / acoustic barrier will provide adequate bushfire separation from the land to the east.

We recommend (where possible) that a minimum 15m APZ is provided around each proposed structure. This will provide a non vegetated buffer to prevent potential bushfire spreading onto the subject site or fire spreading from the subject site onto the adjoining allotments. The recommended APZs are achieved for all proposed structures except for the proposed aggregate storage bay. This is a concrete open structure containing non combustible aggregates. This structure and deficient APZ has zero influence with regards to bushfire behaviour or bushfire protection.

The proposed blending and processing areas are not defined by any building works. All proposed built structures are non combustible and suitably located. In the event of a bushfire it is our view that the proposed development will not influence bushfire behaviour and will not increase bushfire risk for any adjoining properties.

The nominated BAL-ratings which correspond to the Australian Standard AS3959 (The Australian Standard for the Construction of a Building in a Bushfire Prone Area) are provided for reference and can be adopted for the construction of the proposed works. The Class 7 development is not required to comply with AS3959. The general fire safety construction provisions of the NCC (2016) are taken as acceptable solutions, but the aims and objectives of PBP (2006) apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management.

We recommend that all proposed works are constructed from non combustible materials. The asset protection zones nominated in figure 1 are deemed to be adequate. Site access, including access via the public road system is suitable for emergency response vehicles. The development complies with Planning for Bushfire Protection (2006) with regards to the provision of water. The requirements for electricity and gas (if applicable) can also be complied with. We recommend that a bushfire emergency evacuation plan is prepared such that employees and visitors are informed about suitable egress routes away from the site in the event of bushfire. Compliance with the NCC (2016) via compliance with AS3959, the Australian Standard for the Construction of Buildings in Bushfire Prone Areas can also be achieved.

We trust that the information within this report is satisfactory. Should you wish to discuss any of the above, please contact the undersigned.

Regards,



Matthew Noone

Grad.Dip. Design for Bushfire Prone Areas.

BSc (Geology)



## SECTION 15. REFERENCES

Australian Standard 3959 2009, Australian Standard Construction of Buildings in Bushfire Prone Areas, Sydney 2009

Building Code of Australia 2016, Building Code of Australia ,Australian Building Codes Board, Canberra 2015.

Environmental Planning and Assessment Act 1979, NSW Government, NSW, legislation found at [www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au)

Rural Fire Service 2006, Planning for Bushfire Protection, a Guide for Councils,Planners, Fire Authorities and Developers, NSW Rural Fire Service 2006, Sydney

Rural Fires Act 1997, NSW Rural Fires Act, NSW Government, NSW, legislation found at [www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au)

See reference

AS- Australian Standards

BCA- Building Code of Australia

EPA&A –Environmental Planning and Assessment Act

PBP- Planning for Bushfire Protection

RFS – Rural Fire Service

Main reference under full name as above.

## SECTION 16. APPENDICES

Appendix A - Standards for Asset Protection

Appendix B - Site photos

Appendix C - Civil site plan

# STANDARDS FOR APZs

## RFS STANDARDS FOR ASSET PROTECTION

The following information has been taken directly from the RFS document “Standards for Asset Protection”. The full version of this document can be found at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

### RAKING OR MANUAL REMOVAL OF FINE FUELS

- Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of fire.
- Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

### MOWING OR GRAZING OF GRASS

- Grass needs to be kept short and, where possible, green.

### REMOVAL OR PRUNING OF TREES, SHRUBS AND UNDERSTOREY

- The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.
- Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.
- Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

### WHEN CHOOSING PLANTS FOR REMOVAL, THE FOLLOWING BASIC RULES SHOULD BE FOLLOWED

- Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or ‘undesirable species’. Alternatively, a list of noxious weeds can be obtained at [www.agric.nsw.gov.au/noxweed/](http://www.agric.nsw.gov.au/noxweed/);
- Remove more flammable species such as those with rough, flaky or stringy bark; and
- Remove or thin understorey plants, trees and shrubs less than three metres in height
- The removal of significant native species should be avoided.

## GARDEN DESIGN

The following information has been taken directly from the RFS document “Standards for Asset Protection”. The full version of this document can be found at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

### LAYOUT OF GARDENS IN AN APZ

When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting “pencil pine” type trees next to buildings, as these are highly flammable.

### LAYOUT OF GARDENS IN AN APZ

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

- Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

Plants that are less flammable, have the following features:

- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without “ribbons” hanging from branches or trunks; and
- dense crown and elevated branches.



# SITE IMAGES



View looking west from the northern end of the site.



View looking west from the northern end of the site. Numerous stock piles distributed around the site.





View looking south from the northern end of the site.



View looking south west from the middle part of the site. Hawkesbury Banksia Scrub.





View looking south from the northern part of the site. Disturbed canopy, scattered vegetation.



View looking east from the north-middle part of the site. Managed land to the east.

# CIVIL DRAWINGS



