

Bushfire Threat Assessment

Proposed Residential Development

Lot 2 & 3 DP 1256730, 70 Christopher Road and 799 New England Highway, Lochinvar, NSW



Prepared for:

Urban Land & Housing Group Pty Ltd

c/- Barker Ryan Stewart

11 November 2021

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Revision: 01

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Client Name	Barker Ryan Stewart
AEP Project Team	Natalie Black Angela Metcalfe

Revision

Revision	Date	Author	Reviewed	Approved
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00	15/10/2021	Hope O'Dea	Barker Ryan Stewart
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1.0 Introduction

Anderson Environment & Planning was commissioned by Urban Land & Housing Group Pty Ltd c/- Barker Ryan Stewart (the client) to undertake a Bushfire Threat Assessment (BTA) for a proposed residential subdivision Stages 8 to 14 at 70 Christopher Road & 799 New England Highway, Lochinvar, NSW (the Subject Site).

This report is specifically intended to assess the bushfire protection measures required by the NSW Rural Fire Service's "Planning for Bushfire Protection 2019" (PBP) and the construction requirements of the proposed development in accordance with the provisions of the Building Code of Australia – Volume 2, Edition 2010 and Australian Standard 3959-2018 (AS 3959) – "*Construction of buildings in bushfire-prone areas*".

The proposal will involve subdivision for residential purposes as per 100B of the *Rural Fires Act 1997* (RF Act). As a result, a Bushfire Safety Authority (BSA) is required from the Rural Fire Service (RFS) to enable the development to proceed. This report addresses the required heads of consideration relevant to obtaining a BSA.

For the purposes of referencing, this document should be referred to as:

Anderson Environment & Planning (2021). *Bushfire Threat Assessment for Proposed Residential Subdivision Stages 8-14 at 70 Christopher Road and 799 New England Highway, Lochinvar, NSW*. Unpublished report for Barker Ryan Stewart, November 2021.

2.0 Site Particulars

To assist with assessment of the Subject Site an assessment of the site context has been undertaken (Refer **Table 1**).



Table 1 – Site Particulars

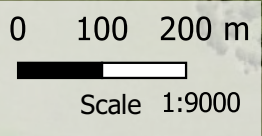
Detail	Comments
Client	Barker Ryan Stewart
Address	70 Christopher Road and 799 New England Highway, Lochinvar, NSW
Title(s)	Lot 2 and 3 DP1256730
LGA	Maitland City Council
Zoning	R1 – General Residential
Subject Site	Consists of a subset of land totally approximately 38.61ha within the above titled lots (78.66ha).
Current Land Use	The site contains one livestock shed and several fenced and gated sections The site is currently used for agricultural purposes. There are three 1st order unnamed watercourses mapped within the site running south east to north west, though there is no obvious bank or bed visible. Overall, the site is highly disturbed with very limited native vegetation. The midstory height trees that line the perimeter of the paddocks are dominated by planted olive trees with a small number of Forest She-Oak.
Surrounding Land Use	To the north of the site is residential development R1 – General Residential. There are large subdivision developments planned for the north-east to north-west of the site with some clearing, roads and street lighting already in place. To the east is RU2 – Rural Landscape containing large predominantly maintained lots. R1 zoning continues to the south west and is currently undeveloped. This area is currently used for cattle grazing. There is a small area of E3- Environmental Management to the south west.
Topography	No land has slopes greater than 18 degrees within subject site. The topography gentle / undulating.
Proposed Development	304 Lot Residential Subdivision, Local Park and Superlot Subdivision with associated civil works for Stages 8 to 14 upon Lots 2 & 3 DP1256730 70 Christopher Road & New England Highway, Lochinvar"

Figure 1 depicts the extent of the site overlain on an aerial photograph of the locality. **Figure 2** depicts the Stages 8 – 14 of the proposed residential subdivisions the Subject Site.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Subject Site: Stages 8-14
-  Study Area



Note:
1. Boundaries are not survey accurate
2. Do not scale off the plan



AEP

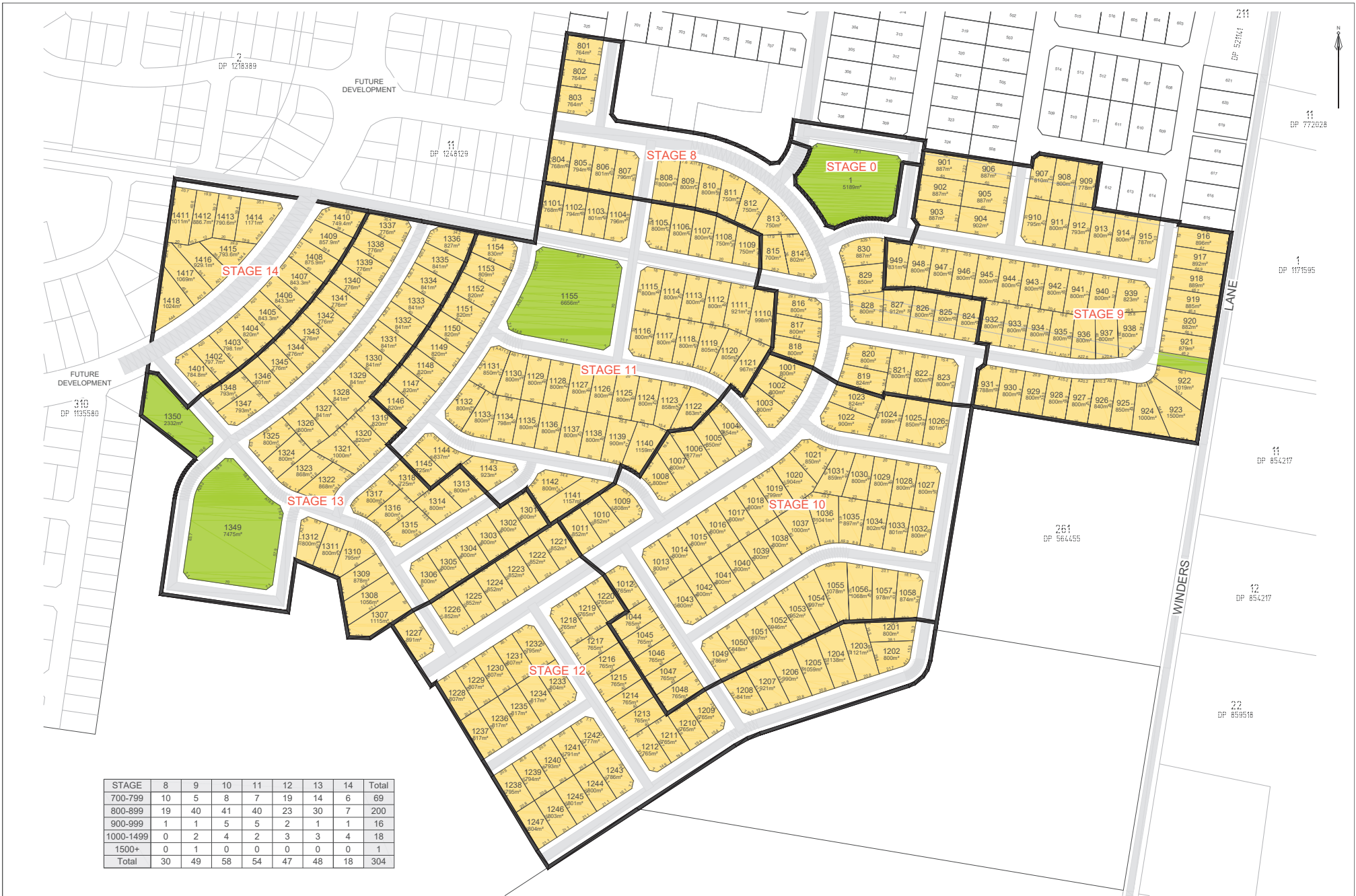
Title: Figure 1 - Site Location

Date: Nov 2021

Location: Stage 8-14 at 70 Christopher Road and 799 New England Highway, Lochinvar NSW

Client: Barker Ryan Stewart

AEP ref: 2475



STAGE	8	9	10	11	12	13	14	Total
700-799	10	5	8	7	19	14	6	69
800-899	19	40	41	40	23	30	7	200
900-999	1	1	5	5	2	1	1	16
1000-1499	0	2	4	2	3	3	4	18
1500+	0	1	0	0	0	0	0	1
Total	30	49	58	54	47	48	18	304

REV	AMENDMENT	ISSUED	DATE
M	ADDED STAGES 0 & 14	MAC	18/10/21



SYDNEY P. 02 9559 0055
CENTRAL COAST P. 02 4325 5255

HUNTER P. 02 4956 5388
S.E. QLD P. 07 5582 5555

www.brs.com.au
mail@brs.com.au
BRB 20 134 067 810

Client: **URBAN LAND & HOUSING PTY LTD**

OVERALL MASTER PLAN
LOTS 2 & 3 DP 1256730
NEW ENGLAND HIGHWAY & CHRISTOPHER ROAD
LOCHINVAR

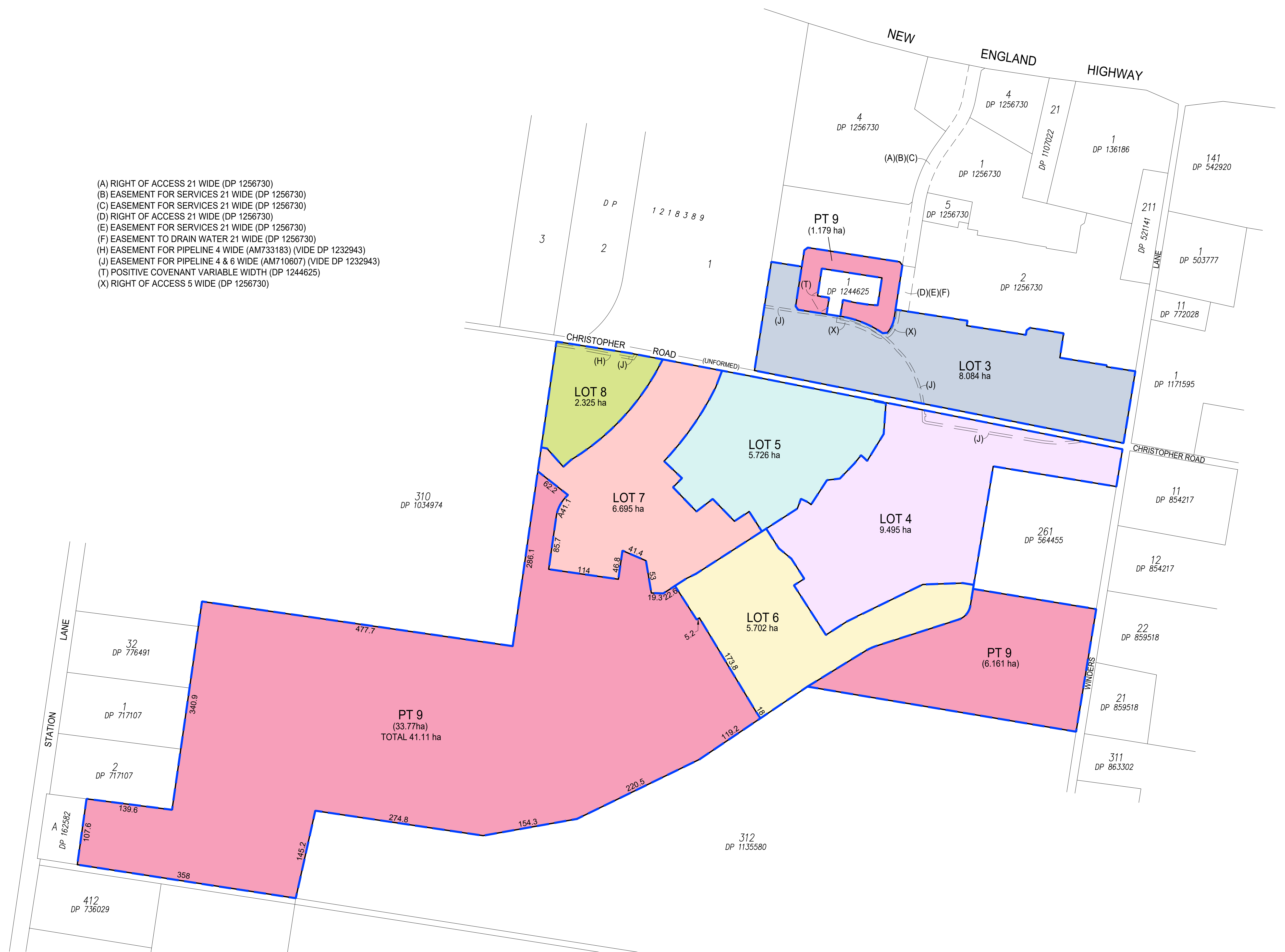
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Drawn: RJG
Checked: DE

Scales: Plan 1:1500
Datum: N/A

Plan No. **ID196344**
File Ref. **14/46**

Sheet No. **3**
REV. **M**

- (A) RIGHT OF ACCESS 21 WIDE (DP 1256730)
- (B) EASEMENT FOR SERVICES 21 WIDE (DP 1256730)
- (C) EASEMENT FOR SERVICES 21 WIDE (DP 1256730)
- (D) RIGHT OF ACCESS 21 WIDE (DP 1256730)
- (E) EASEMENT FOR SERVICES 21 WIDE (DP 1256730)
- (F) EASEMENT TO DRAIN WATER 21 WIDE (DP 1256730)
- (H) EASEMENT FOR PIPELINE 4 WIDE (AM733183) (VIDE DP 1232943)
- (J) EASEMENT FOR PIPELINE 4 & 6 WIDE (AM710607) (VIDE DP 1232943)
- (T) POSITIVE COVENANT VARIABLE WIDTH (DP 1244625)
- (X) RIGHT OF ACCESS 5 WIDE (DP 1256730)



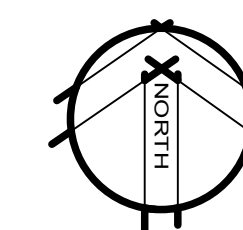
REV	AMENDMENT	ISSUED	DATE
A	PRELIMINARY ISSUE ONLY	MAC	17/12/20
B	AMENDED LOT LAYOUT	MAC	01/03/21
C	AMENDED LOT LAYOUT	MAC	04/11/21



SYDNEY
P: 02 9659 0005
CENTRAL COAST
P: 02 4325 5255
HUNTER
P: 02 4966 8388
ABN: 26 134 067 842
www.brs.com.au
mail@brs.com.au

Client:
URBAN LAND & HOUSING PTY LTD

**SUPERLOT PLAN
LOT 3 DP 1256730
& LOT 1 DP 1244625**



Designed: --
Drawn: MAC
Checked: DE

Scales: Plan 1:3000

Datum: N/A

Plan No.
ID215903
File Ref.
14/46

Sheet No.
1
REV.
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3.0 Bushfire Hazard Assessment

3.1 Bushfire Prone Land Mapping

Examination of Maitland City Council LGA Bushfire Prone Land (BPL) Mapping (NSW Planning Portal) confirms that part of the site is mapped as “Bushfire Prone Land - Vegetation Buffer” as shown in Figure 3. This designation has triggered the need for this assessment as part of the Development Application submission.



Appendix 1 of the PBP provides the steps required to determine the level of bushfire hazard that applies to the site. Factors influencing the hazard level include:

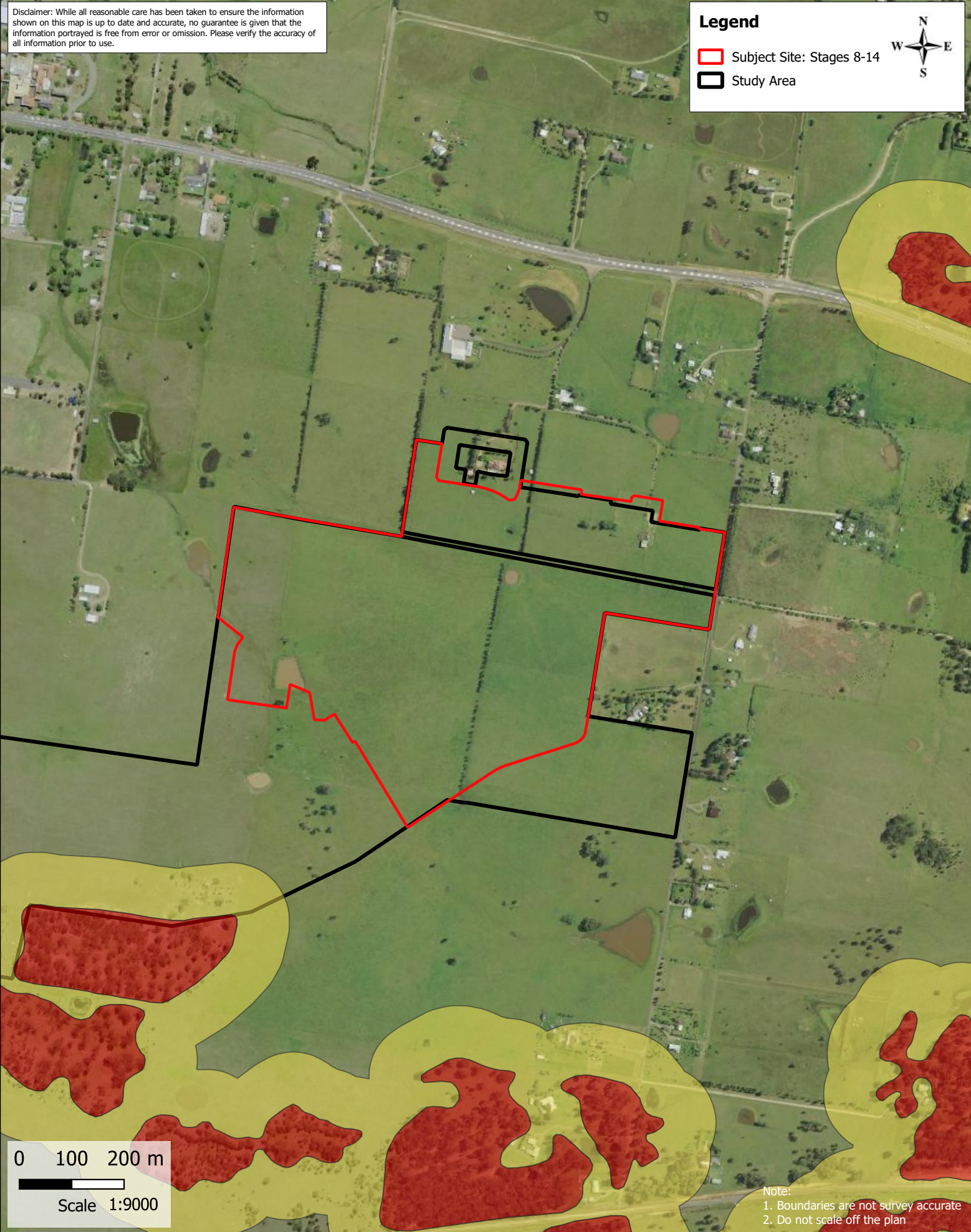
- The formation of vegetation surrounding the site (as defined by Keith 2004);
- The distance between vegetation and the site (or proposed buildings therein);
- The effective slope for each patch of vegetation; and
- The Fire Danger Index (FDI) of the council area within which the development occurs.

These factors together provide an indication of the level of threat posed to the development from any vegetation retained within the site and surrounding vegetation in the event of a bushfire, and the required mitigation measures to be taken in the form of Asset Protection Zones (APZs) and building construction standards. These measures are detailed further in **Section 5**.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

-  Subject Site: Stages 8-14
-  Study Area



0 100 200 m
Scale 1:9000

Note:
1. Boundaries are not survey accurate
2. Do not scale off the plan



AEP

Title: Figure 1 - Site Location

Date: Nov 2021

Location: Stage 8-14 at 70 Christopher Road and 799 New England Highway, Lochinvar NSW

Client: Barker Ryan Stewart

AEP ref: 2475

3.2 Vegetation Analysis

The site and surrounds occur within the Greater Hunter region, with existing vegetation subsequently classified with a Fire Danger Index (FDI) of 100 as NSW Rural Fire Service (2017) NSW Local Government Areas FDI.

The entirety of the Lot is proposed to be cleared. As a result, all hazard vegetation is located on adjoining properties. Hazard vegetation identified from surveys:

- **North** – Managed residential land currently under development;
- **North East** – Managed grasslands;
- **East** – Grasslands;
- **South East** – Managed grassland;
- **South** – Managed grasslands;
- **South West** – Managed grassland;
- **West** – Managed grassland; and
- **North West** – Managed grassland.

The vegetation within the proposed development area consists of a paddock of open managed grassland and exotic weeds. Vegetation surrounding the site that constitutes hazard vegetation is classified as Grassland, as can be seen in **Figure 5**. Refer **Plates 1-8** which depict the vegetation within 140m and also **Appendix A**.

3.3 Slope Analysis

The site has a general undulating slope throughout its boundaries. Available contour mapping is at 10m intervals indicating the central third of the site is at 60m asl and falls downslope 5.7 degrees to the north, south east and west. North west, south, south west, and east are all upslope or flat. See **Figure 4**.

Examination of slope class to relevant hazard areas reveals:

- East – Flat / Upslope;
- All other directions - No hazard vegetation is present



Plate 1: Grassland hazard vegetation looking east.



Plate 2: Managed land to the east of the Subject Site looking north west



Plate 3: Most southern point looking south east managed/grazed land.



Plate 4: North eastern boundary looking north.



Plate 5: North west boundary corner looking south west note the dirt berm created by neighbouring development.



Plate 6: Midway along north west boundary looking west.



Plate 7: View from the southern boundary looking south.

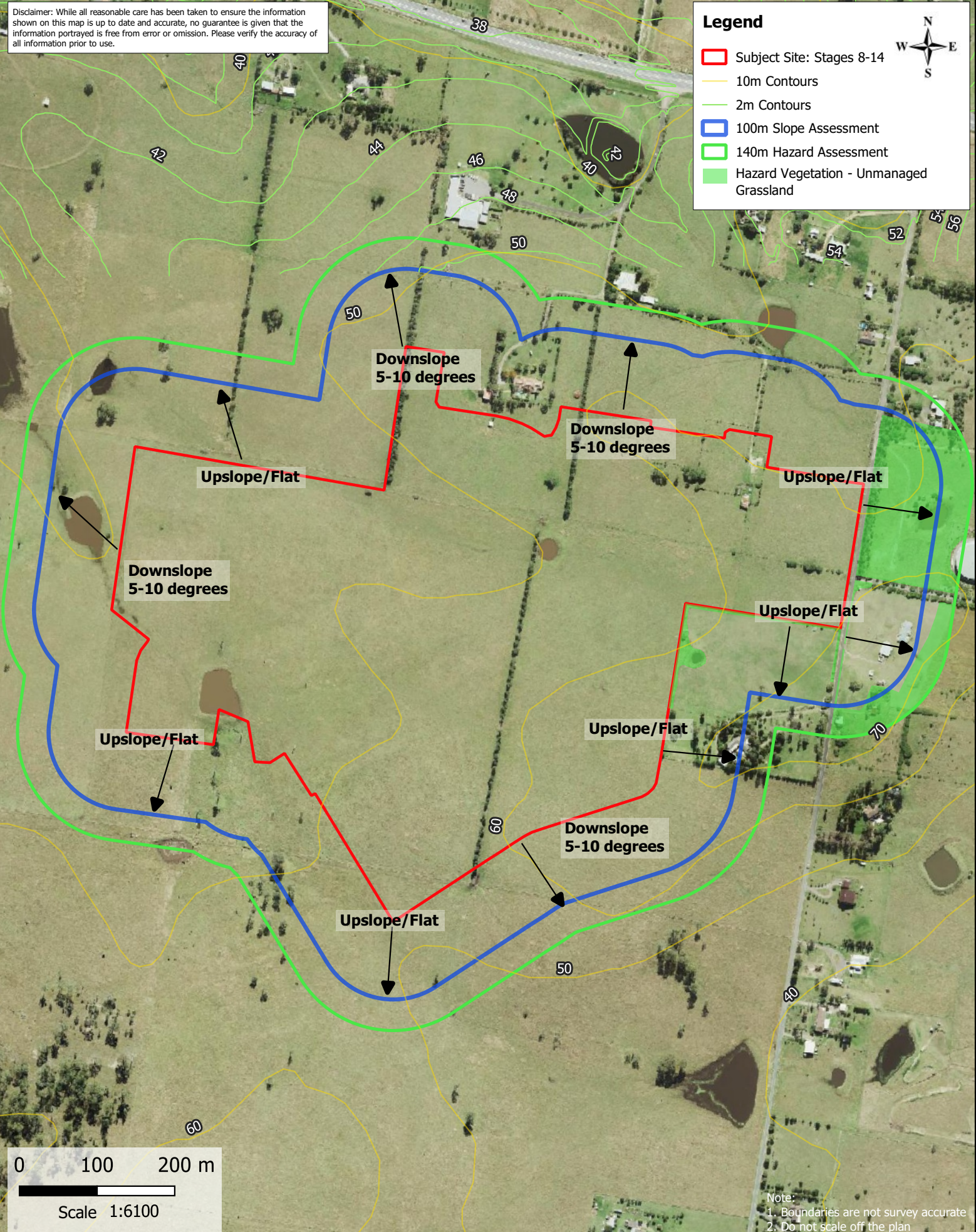


Plate 8: View from the northern boundary looking north.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

- Subject Site: Stages 8-14
- 10m Contours
- 2m Contours
- 100m Slope Assessment
- 140m Hazard Assessment
- Hazard Vegetation - Unmanaged Grassland



0 100 200 m
Scale 1:6100

Note:
1. Boundaries are not survey accurate
2. Do not scale off the plan



AEP

Title: Figure 4 - Slope and Hazard Assessment

Date: Nov 2021

Location: Stage 8-14 at 70 Christopher Road and 799 New England Highway, Lochinvar NSW

Client: Barker Ryan Stewart

AEP ref: 2475

3.4 PBP Performance Criteria Assessment

Tables 2 provides the assessment of the PBP Performance Criteria for residential subdivision.

Table 2 - Performance Criteria Measures for Residential and Rural Subdivision

Performance Criteria	Acceptable Solutions	Assessments
Assets Protection Zones		
<p>Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot.</p>	<p>APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.</p>	<p>APZ provided for the subdivision:</p> <ul style="list-style-type: none"> • North – N/A • North east – N/A • East – 10m Grassland • South east – N/A • South – N/A • South west – N/A • West – N/A • North west – N/A
<p>APZs are managed and maintained to prevent the spread of a fire towards the building.</p>	<p>APZs are managed in accordance with the requirements of Appendix 4.</p>	<p>APZs are to be managed as per below.</p> <p><u>Inner Protections zones</u></p> <p>Trees: tree canopy cover should be less than 15% at maturity; trees at maturity should not touch or overhang the building; lower limbs should be removed up to a height of 2m above the ground; tree canopies should be separated by 2 to 5m; and preference should be given to smooth barked and evergreen trees.</p> <p>Shrubs create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided; shrubs should not be located under trees; shrubs should not form more than 10% ground cover; and clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.</p> <p>Grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and leaves and vegetation debris should be removed.</p> <p><u>Outer Protection Zones</u></p>

Performance Criteria	Acceptable Solutions	Assessments
		<p>Tree canopy cover should be less than 30%; and canopies should be separated by 2 to 5m.</p> <p>Shrubs should not form a continuous canopy; and shrubs should form no more than 20% of ground cover.</p> <p>Grass should be kept mown to a height of less than 100mm; and leaf and other debris should be removed.</p> <p>An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.</p>
The APZs is provided in perpetuity.	APZs are wholly within the boundaries of the development site	All APZ are proposed within the property boundary
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are located on lands with a slope less than 18 degrees.	No slopes greater the 18 degrees are located within the property.
Landscaping		
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Landscaping is in accordance with Appendix 4	All landscaping will comply with requirements above for APZ management.
	Fencing is constructed in accordance with section 7.6.	All fences and gates within the proposed development must be made of either hardwood or non-combustible material. However, in circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.
Access		
Firefighting vehicles are provided with safe, all-weather access to structures.	Property access roads are two-wheel drive, all-weather roads;	All roads within the development will be two-wheel drive.
	Perimeter roads are provided for residential subdivisions of three or more allotments;	<p>Perimeter road will be staged, as the masterplan for the area is developed perimeter road will be finalised. Currently the site plans have a perimeter boundary road around the majority of Stages 8-14. The remaining small sections of the planning proposal that are yet to include a perimeter road will see a perimeter road placed in future stages of the development.</p> <p>In the interim, there is no hazard vegetation in close proximity to these sections and there is ample space and accessibility for firefighting equipment to gain access due to being maintained and open paddocks. This should provide</p>

Performance Criteria	Acceptable Solutions	Assessments
		adequate access to the site until the land to the west is developed and the perimeter road is completed.
	Subdivisions of three or more allotments have more than one access in and out of the development	Complies, with multiple access points to the north and east following the completion of the additional development stages.
	Traffic management devices are constructed to not prohibit access by emergency services vehicles	All traffic management devices will be constructed to ensure emergency services vehicles can access the site.
	Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient	Complies
	All roads are through roads	The masterplan has all through roads, Stages 8 to 14 has some roads which will be temporarily no through roads, however the staging has been undertaken to ensure there are no roads longer than 200m without alternative exits.
	Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end	Not applicable to this application.
	Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road	All road designs will comply with having a roll top kerbing when adjoining hazard vegetation.
	Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and	Not applicable to this application.
	One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression	Not applicable to this application as no one way roads are proposed.

Performance Criteria	Acceptable Solutions	Assessments
The capacity of access roads is adequate for firefighting vehicles.	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ causeways are to clearly indicate load rating.	All roads within the development will be designed to carry the load of a fully loaded firefighting vehicle.
There is appropriate access to water supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;	All hydrants will be located outside of parking reserves and road carriageways.
	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning	All hydrants will meet AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning
	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	Not applicable to this application.
Perimeter Roads		
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.	Are two-way sealed roads;	As stated above the construction will be designed to ensure compliance.
	Minimum 8m carriageway width kerb to kerb;	As stated above the construction will be designed to ensure compliance.
	Parking is provided outside of the carriageway width;	As stated above the construction will be designed to ensure compliance.
	Hydrants are located clear of parking areas;	As stated above the construction will be designed to ensure compliance.
	Are through roads, and these are linked to the internal road system at an interval of no greater than 500m;	Perimeter road will be staged, as the masterplan for the area is developed perimeter road will be finalised. The proposal currently proposes to have several internal roads through the centre of the development. This should provide adequate access to the site until the land to the north and west is developed and the perimeter road is completed.
	Curves of roads have a minimum inner radius of 6m;	As stated above the construction will be designed to ensure compliance.
	The maximum grade road is 15 degrees and average grade of not more than 10 degrees;	As stated above the construction will be designed to ensure compliance.

Performance Criteria	Acceptable Solutions	Assessments
	The road crossfall does not exceed 3 degrees; and	As stated above the construction will be designed to ensure compliance.
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	As stated above the construction will be designed to ensure compliance.
Non-Perimeter Roads		
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Minimum 5.5m carriageway width kerb to kerb;	Complies
	Parking is provided outside of the carriageway width;	As stated above the construction will be designed to ensure compliance.
	Hydrants are located clear of parking areas;	As stated above the construction will be designed to ensure compliance.
	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m;	As stated above the construction will be designed to ensure compliance.
	Curves of roads have a minimum inner radius of 6m;	As stated above the construction will be designed to ensure compliance.
	The road crossfall does not exceed 3 degrees; and	As stated above the construction will be designed to ensure compliance.
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	As stated above the construction will be designed to ensure compliance.
Property Access		
Firefighting vehicles can access the dwelling and exit the property safely	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.	Not applicable to this application.
Water Supplies		
Adequate water supplies is provided for firefighting purposes.	Reticulated water is to be provided to the development where available;	Provided

Performance Criteria	Acceptable Solutions	Assessments
	A static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed; and	Not applicable to this application
	Static water supplies shall comply with Table 5.3d.	Not applicable to this application
Water supplies are located at regular intervals; and the water supply is accessible and reliable for firefighting operations.	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005;	As stated above the construction will be designed to ensure compliance
	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005;	As stated above the construction will be designed to ensure compliance
	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	As stated above the construction will be designed to ensure compliance
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	As stated above the construction will be designed to ensure compliance
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps;	As stated above the construction will be designed to ensure compliance
	Above-ground water storage tanks shall be of concrete or metal.	As stated above the construction will be designed to ensure compliance
Non-reticulated developments		
Residential lots (<1,000m ²)	5,000L/lot	Not applicable to this application
Rural-residential lots (1,000-10,000m ²)	10,000L/lot	Not applicable to this application
Large rural/lifestyle lots (>10,000m ²)	20,000L/lot	Not applicable to this application
Multi-dwelling housing (including dual occupancies)	5,000L/dwelling	Not applicable to this application
Electricity Services		
Location of electricity services limits the possibility of ignition of	Where practicable, electrical transmission lines are underground;	As stated above the construction will be designed to ensure compliance

Performance Criteria	Acceptable Solutions	Assessments
surrounding bush land or the fabric of buildings.	Where overhead, electrical transmission lines are proposed as follows: Lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; No part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines.	As stated above the construction will be designed to ensure compliance
Gas Services		
location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used;	As stated above the construction will be designed to ensure compliance
	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;	As stated above the construction will be designed to ensure compliance
	Connections to and from gas cylinders are metal;	As stated above the construction will be designed to ensure compliance
	Polymer-sheathed flexible gas supply lines are not used;	As stated above the construction will be designed to ensure compliance
	Above-ground gas service pipes are metal, including and up to any outlets.	As stated above the construction will be designed to ensure compliance

4.0 Bushfire Hazard Determination

4.1 Construction Standards – AS 3959:2018

As outlined above, the identification of proximate hazards post development has resulted in the need for APZs, and hence consideration of related construction standards.

The Australian Standard 3959:2018 “Construction of buildings in bushfire prone areas”, details six (6) levels of construction standard that are required for buildings, depending upon the expected impact of a bushfire from adjacent areas. These Bushfire Attack Levels (BAL) are measured from the edge of the hazard and incorporate vegetation type and slopes (Section 4) to determine the relevant distance for each BAL rating (and associated construction standard).

The relationship between the expected impact of a bushfire and the BAL rating is provided in **Table 3** below. BALs and APZs are shown in **Figure 5**.

Table 3 - BAL Construction Standard

Bushfire Attack Level	Maximum radiant heat impact (kW/m ²)	Level of construction standard under AS 3959:2018
Low		No special construction requirements
12.5	≤12.5	BAL – 12.5
19	12.6 to 19.0	BAL – 19
29	19.1 to 29	BAL - 29
40	29 to 40	BAL – 40
Flame Zone	≥40	BAL – FZ (Not deemed to satisfy provisions)

The BAL construction standards applicable for the proposed development are:

Upslope/ flat towards Grassland vegetation to the East

- <8m – BAL-FZ
- 8 - <10 m – BAL-40
- 10 to <15m – BAL-29
- 15 to <22m – BAL-19
- 22 to < 50m – BAL-12.5

Figure 5 shows the required APZ and BALs for the Subject Site.

Figure 5 – Required APZ and BALs


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Legend

 Subject Site: Stages 8-14




Bushfire Attack Levels (BALs)

 BAL - FZ

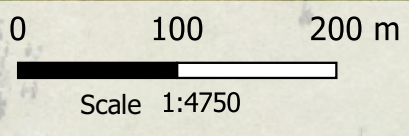
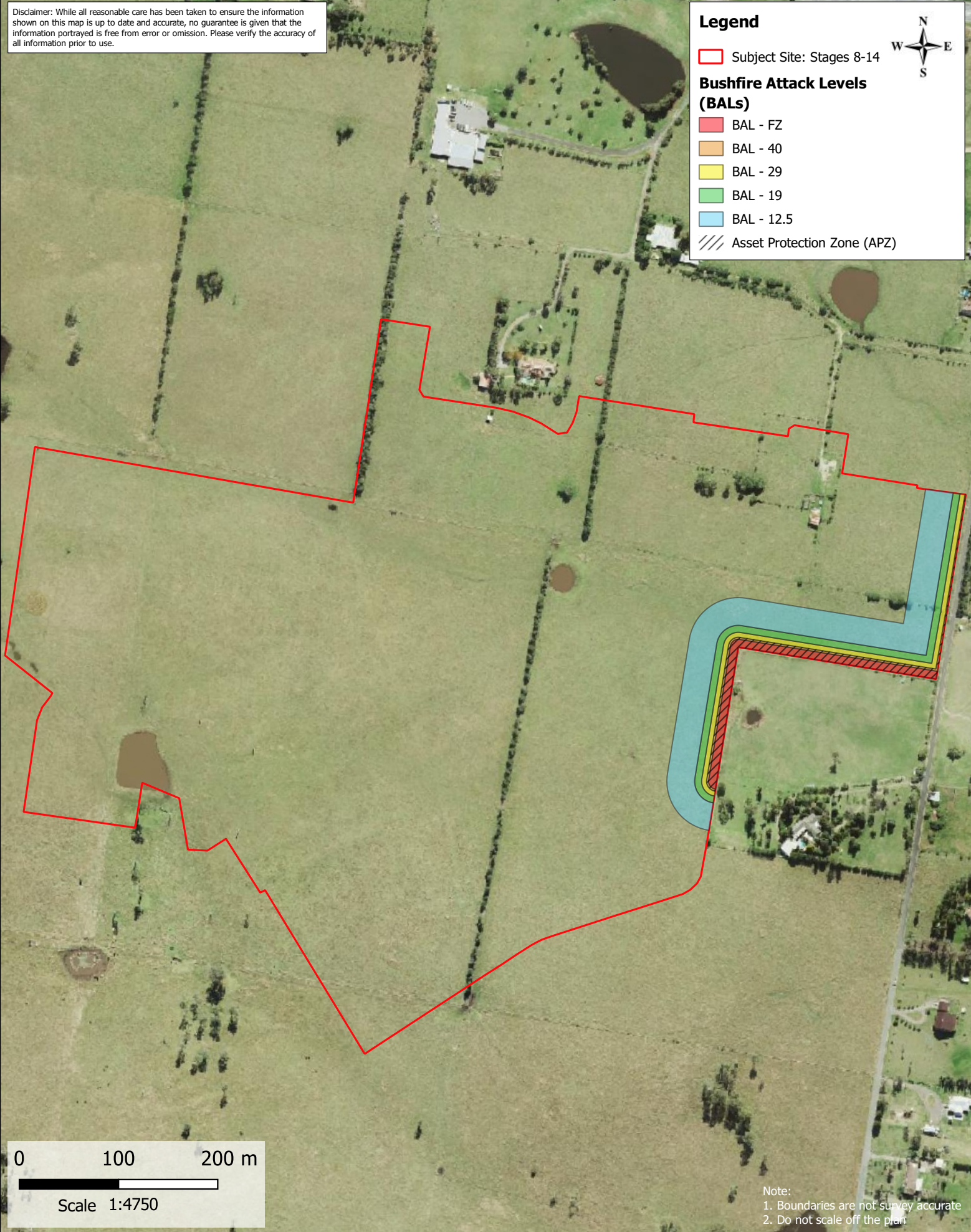
 BAL - 40

 BAL - 29

 BAL - 19

 BAL - 12.5

 Asset Protection Zone (APZ)



Note:
1. Boundaries are not survey accurate
2. Do not scale off the plan



AEP

Title: Figure 5 - BALs and APZs

Date: Nov 2021

Location: Stage 8-14 at 70 Christopher Road and 799 New England Highway, Lochinvar NSW

Client: Barker Ryan Stewart

AEP ref: 2475

5.0 Other Considerations

Table 4 analysis applies to the site in reference to other environmental features present.

Table 4 – Other Environmental Features

Environmental Feature	Assessment
Riparian Corridors	Three 1st order streams run through the Subject Site running south east to north west.
SEPP (Coastal Management) 2018	N/A
SEPP Koala 2021	N/A
Areas of geological interest	None present.
Environmental protection zones or steep lands (>18°)	None present
Land slip or flood prone areas	None present
National Parks estate or various other reserves	None present
Threatened species matters	Several threatened species are known from the area. Ecological investigations are required to determine presence or otherwise
Aboriginal Heritage	None known to be present.

6.0 Conclusion

Investigations undertaken for this Bushfire Threat Assessment report have revealed that the proposed residential subdivision will be affected by a small amount of Grassland vegetation to the east.

Required Asset Protection Zones and associated BAL construction standards have been derived and applied to the site. It has been shown that existing and future hazards associated with the land surrounding the Subject Site will result in the required APZ encroaching slightly into the Subject Site. As such, the position of future building envelopes will need to take this into consideration.

Site plans provided to AEP indicate that there are future development plans to the west and north as part of a broader development plan that will reduce bushfire hazard for the Subject Site and provide public road access surrounding the Subject Site. Following a site visit the development to the north has been undertaken with clearing and some roads and street lighting already in place. Approval of this development and development of associated roads will provide public road access surrounding the Subject Site. As the site currently stands there are no additional hazards present as all vegetation is well managed with the exception of the mapped hazard vegetation shown in Figure 4. Therefore, in the event the additional proposed future developments do not go ahead there will be no increase in bushfire threat to the Subject Site.

A reticulated water supply system from established residential areas is expected to service the site, and street hydrant access will need to be delivered in accordance with AS2419.1 – 2017.

It is considered that the proposed protection measures, principally APZ's, roads with parking on one side and relevant construction standards, would comply with the relevant requirements of PBP 2019 and AS-3959. When applied, these measures should provide adequate protection to life and property within the proposed development in the event of a bushfire occurring in the immediate locality.

As such, it is considered that the residential subdivision would be able to meet the required objectives and principles of PBP 2019. However, it can never be guaranteed that the site and residents and property therein will not at some stage be affected by a bushfire event.

7.0 References

NSW Government (1979). *Environment and Planning & Assessment Act 1979*. NSW Government, Sydney.

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NSW Office of Environment and Heritage (OEH) (2019). *Planning for Bushfire Protection*. NSW Rural Fire Service / NSW Department of Planning, Sydney.

Standards Australia (2018) AS-3959 *Construction of Buildings in Bushfire-Prone Areas*. Standards Australia, Sydney.

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<https://storymaps.arcgis.com/stories/b7c3dd632a174d239bf72fa20226ca96>

Appendix A – Site Photos



Plate 9: Grassland hazard vegetation facing east to Winders Lane.



Plate 10: Grassland hazard vegetation to the east.



Plate 11: Unmanaged Road reserves to the east.



Plate 12: North western boundary looking north west.



Plate 13: Western boundary looking west. Development planning stakes visible.



Plate 14: South western boundary looking south west.