BUSH FIRE ASSESSMENT REPORT

Subdivision
9 x Lots

Lot 3 DP 1201486

No 80 Silverdale Road

The Oaks

Mr & Mrs Nocera

C/- Proficient Constructions (Aust) Pty Ltd

August 2024

PO Box 353 Kempsey NSW 2440 – phone 0265660413 – mecham@bigpond.com – ABN 32098436812

1.0 INTRODUCTION

A Bush Fire Assessment has been carried out for a proposed 9 x lot subdivision at Lot 3 DP 1201486 No 80 Silverdale Road, The Oaks.

Due to the proposed rezoning ,the report also considers the relevant areas of Table 4.2.1 (Bush Fire Strategy Study) of Planning for Bush Fire Protection 2019 (PBP, 2019).

This report is based on a site assessment carried out in August 2023 for a 17 x lot rural residential subdivision and provides a basis for compliance with respect to NSW Rural Fire Services, PBP, 2019 and AS3959 (2018).

A Fire Design Brief/Pre Development process was undertaken with the RFS to establish parameters with respect to the report. A reply was received from the RFS which is attached as **Appendix 1**.

The comments were noted and the proposal was amended to create nine (9) residential lots under the provisions of Wollondilly Local Environment Plan 2011 under the proposed Large Lot Residential zone and a perimeter road is now proposed for the development and the vegetation has been assessed in accordance with the RFS GIS Vegetation Mapping.

The subdivision is an integrated development and has a requirement for a Bushfire Safety Authority under Section 100B of the *Rural Fires Act 1997*.

NOTE

The report has been prepared with all reasonable skill, care and diligence.

The information contained in this report has been gathered from field survey, experience and has been completed in consideration of the following legislation.

1. Rural Fires Act 1997.
2. Environmental Planning and Assessment Act 1979 No 203.
3. Building Code of Australia.
4. Council Local Environment Plans and Development Control Plans where applicable.
5. NSW Rural Fire Services, Planning for Bushfire Protection, 2019 (PBP, 2019).
6. AS 3959-2018 Construction of Buildings in Bushfire Prone Areas.

The report recognizes the fact that no property and lives can be guaranteed to survive a bushfire attack.

The report examines ways the risk of bushfire attack can be reduced where the subdivision site falls within the scope of the legislation.

The report is confidential and the writer accepts no responsibility of whatsoever nature, to third parties who use this report or part thereof is made known.

Any such party relies on this report at their own risk.

1.1 Objectives

The objectives of this report are to:

- Ensure that the proposed subdivision meets the aims and objectives of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019 and has measures sufficient to minimize the impact of bushfires; and
- Reduce the risk to property and the community from bushfire; and
- Comply where applicable with AS3959 – 2018.

1.2 Legislative Framework

In NSW, the bushfire protection provisions of the BCA are applied to Class 1, 2, 3, Class 4 parts of buildings, some Class 10 and Class 9 buildings that are Special Fire Protection Purposes (SFPPs).

The BCA references AS3959 – 2018 as the deemed-to-satisfy (DTS) solution for construction requirements in bushfire prone areas for NSW.

All development on bushfire prone land in NSW should comply with the requirements of the bushfire protection measures identified within NSW Rural Fire Service, Planning for Bushfire Protection, 2019**.**

The proposal is for a rezoning and therefore the Strategic Planning section of PBP, 2019 is to be considered.

The proposed subdivision is required to obtain a Bushfire Safety Authority from the NSW Rural Fire Service.

1.3 Location

The site is located at Lot 3 DP1201486 No 80 Silverdale Road, The Oaks.

Locality – The Oaks
Local Government Area – Wollondilly Shire Council
Closest Rural Fire Service – Wollondilly
Closest Fire Control Centre – Picton

Figure 1 – Topographic Map

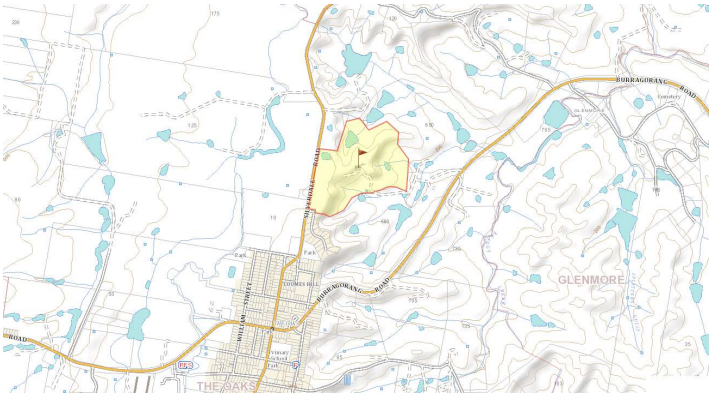


Figure 2 – Aerial View

1.4 Development Proposal and History

The subject site is approximately 32 hectares and the subdivision layout can be seen in **Appendix 2**.

2.0 BUSH FIRE ASSESSMENT

2.1 Assessment Methodology

Several factors need to be considered in determining the bushfire hazard.

These factors are slope, vegetation type, and distance from hazard, access/egress and fire weather.

Each of these factors has been reviewed in determining the bushfire protection measures.

The assessment of slope and vegetation being carried out in accordance with NSW Rural Fire Service, Planning for Bushfire Protection, 2019.

2.2 Slope Assessment

Slope is a major factor to consider when assessing the bushfire risk.

The slopes were measured using a RangeFinder True Pulse 200.

The hazard vegetation on adjacent land was also identified and the slopes within the vegetation measured.

The following table shows the results:

Table 1 – Hazard Vegetation Slopes

Hazard Aspect	Slope
North	0-5° Downslope 0° Flat
East	26-31° Downslope
West	5-10° Downslope

Detailed in **Table 1** the slopes in the steeper parts of the eastern hazard are over 20° and those steeper slopes extend for approximately 80 metres.

A 5-10° downslope has been conservatively considered in the hazard to the west. The grassland hazard is a 6° downslope and the forest hazard has less slope. There will be opportunities to achieve a reduced APZ to the west when specific reporting is completed.

To determine the slope that will affect the fire, verification methods have been used (Couch V4.1), comparison with the deemed to satisfy provisions of Planning for Bush Fire Protection (2019) and AS3959 (2018).

2.3 Vegetation Assessment

The vegetation on and surrounding the subject site was assessed over a distance of 140m.

The vegetation formations were classified using the vegetation formation as detailed in Planning for Bush Fire Protection, 2019.

2.3.1 Vegetation on the Subject Lot

The subject lot consists of grassland, exotic species and the Coastal Valley Woodland which is mapped.

The hazard to the east mostly exotic species (lantana) in the steep areas and grassland in the less steep areas further to the east of the development, which is currently managed by cattle grazing.

There is a continuation of the woodland/exotic species the further the block travels to the north.

2.3.2 Vegetation adjacent and adjoining the Subject Lot

Figure 3 details the landscape affecting a bushfire approaching the subject land.

The predominant bushfire landscape features within the 5km assessment area consist of:

1. Bushfire hazards (bushland) in north, east and west directions.
2. Grassland and fragmented forest vegetation to the north, with significant forest vegetation approximately 870m to the northwest of the property boundary.
3. Remnant vegetation especially around the riparian areas and grassland to the east.
4. Mostly grassland to the west with a remnant piece of forest vegetation directly opposite the lot and further forest vegetation approximately 1.6 kilometres from the property boundary.

Figure 3

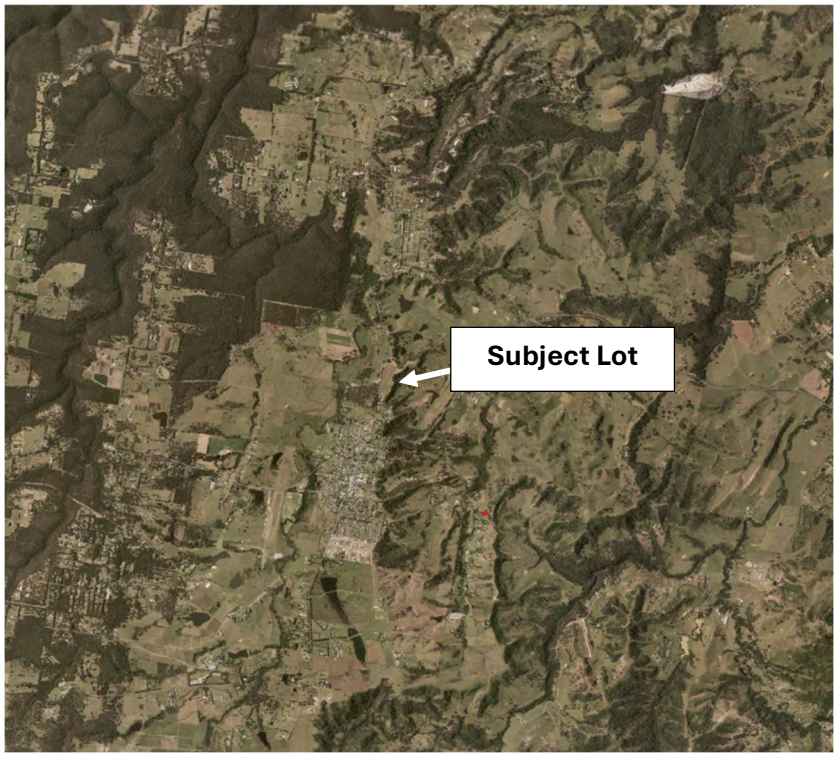


Table 2 – Hazard Vegetation

Hazard Aspect	Vegetation
North	Grassland and Forest
East	Coastal Valley Woodland
West	Forest and grassland

Photos 1, 2, 3 & 4 showing the eastern hazard

Photo 2

Photo 3

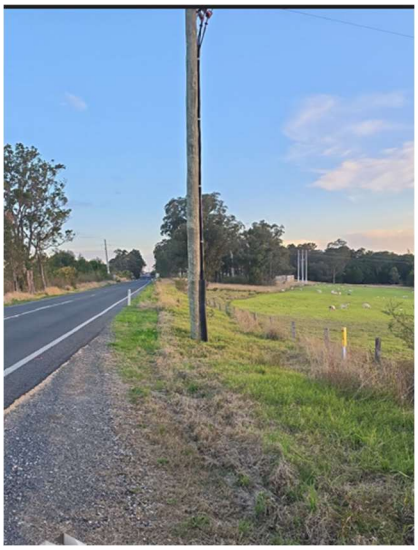
Photo 4

Photo 5 – Showing the grassland

Photo 6 – Showing main area of the western hazard forest

Photo 7 – Showing smaller area of forest on the western hazard

Photo 8 – Looking from the south towards the proposed lots



2.4 Hazard

The hazards are located to the north, east and west of the subject lot.

Figure 4 – Hazards

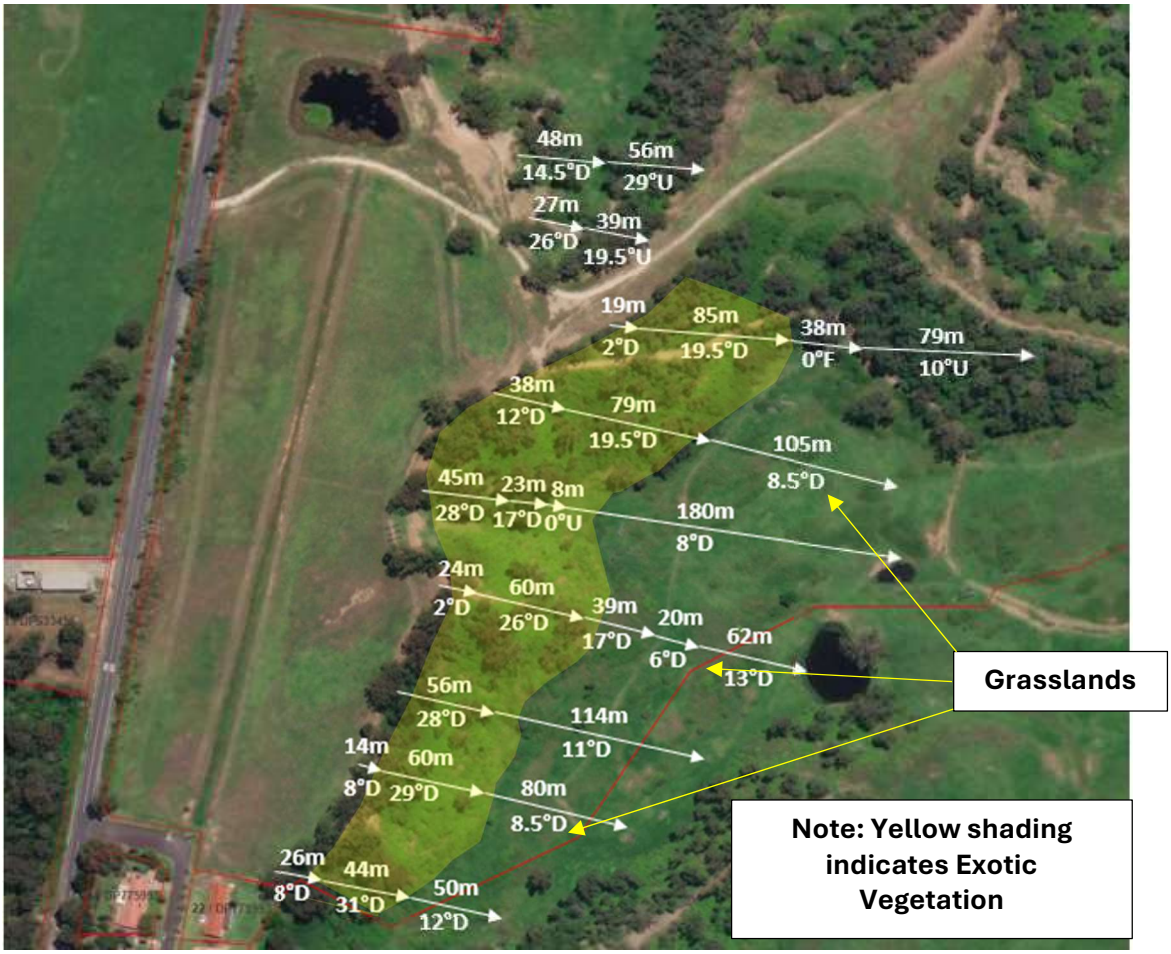


Figure 5

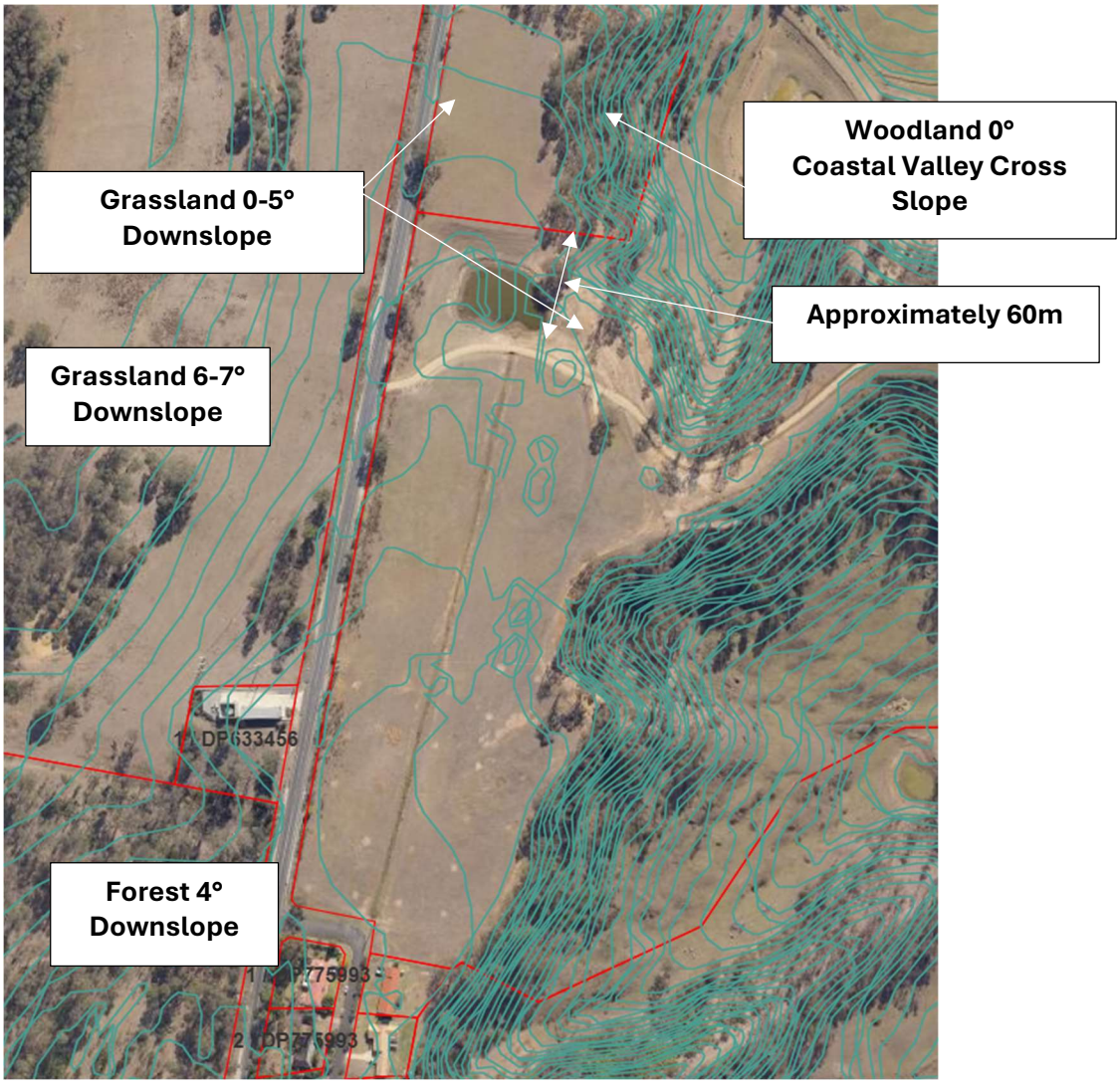


Figure 6 - Bushfire Mapping

Table 3 – Summary of Hazard Characteristics

Hazard Aspect	Hazard	Slope
North	Grassland and Coastal Valley Woodland	0-5° Downslope
East	Coastal Valley Woodland	26-29° Downslope
West	Forest and grassland	5-10° Downslope

With regards to the hazard:

a. The hazard to the east has been discussed through a fire design process and it was determined that the RFS GIS mapping considered the site as Coastal Valley Woodland. The fire design brief noted that the vegetation existing consisted of thick lantana and one of the purposes of the brief was to possibly consider the vegetation because of the denseness of the lantana similar to rainforest. This report has considered the vegetation as per the RFS Vegetation Mapping.

b. A 0-5° downslope has been conservatively considered for the hazard to the north which is the drainage basin and the grassland beyond the basin. A grassland hazard has been considered for the drainage basin. There is a 0° cross slope hazard of Coastal Valley Woodland which is located approximately 60m from the commencement of road. There is 0-5° downslope grassland between the Coastal Valley hazard and the road.

c. The hazard to the west consists of forest and grassland. The forest is in the southern part and centre with the grassland is in the northern part. The small area of forest vegetation has been conservatively assessed as a forest hazard.

d. A slope of 29° downslope was used in the modelling to build a factor of safety into the reporting.

2.5 Fire Danger Index

The fire weather for the site is assumed on the worst-case scenario. In accordance with NSW Rural Fire Service the fire weather for the site is based upon the 1:50 year fire weather scenario and has a Fire Danger Index (FDI) of 80.

3.0 BUSHFIRE THREAT REDUCTION MEASURES

3.1 NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019

The following provisions of NSW Rural Fire Service, *Planning for Bushfire Protection*, 2019 have been identified:

3.1.1 Defendable Space/Asset Protection Zone (APZ)

To ensure that the aims and objectives of NSW Rural Fire Services, PBP, 2019, a defendable space between the asset and the hazard should be provided. The defendable space provides for, minimal separation for safe firefighting, reduced radiant heat, reduced influence of convection driven winds, reduced ember viability and dispersal of smoke.

The proposed subdivision is not considered to be subject to the Special Fire Protection Purpose requirements which are applicable to schools, (the proposed development is not a school).

It is recommended that the defendable space be based upon the minimum requirements for Asset Protection Zones as set out in Planning for Bush Fire Protection, 2019.

Table 4 - APZ Requirements (PBP 2019)

Hazard Aspect	Vegetation Type	Slope	IPA	OPA	Total APZ Required (IPA + OPA)
North	Grassland Coastal Valley Woodland	0-5° Downslope 0° Flat	11m 11m	- -	11m See Reporting in Hazard Section
East	Coastal Valley Woodland	26-29° Downslope	-	-	See **Note 1**
West	Forest then grassland	5-10° Downslope	16m 12m	15m	31m 12m

Due to the slope being in excess of 20°, Performance Reporting is required for the slope to the east.

The modelling has used the RFS GIS Vegetation Management Mapping and the Coastal Valley Woodland Formation.

Further modelling and investigation into the fuel loads of the hazard may reduce the Asset Protection Zone nominated for the planning proposal.

Included are two (2) models for the Coastal Valley Woodland Formation:

a. The separation distance including flame length.
b. The second separation distance excluding flame length.

Both these separation distances are shown on the Civil Works Plan and both models were completed using Bush Fire Attack Assessor (Couch V4.1).

The separation for minimum APZ (BAL 29) is 63m including flame length and 58m excluding flame length.

It should be noted that the APZ line shown on the Engineering plan does not include the existing grassland hazard. This grassland can be assessed as 0-5° slope and would require a 11m Asset Protection zone well inside the APZ required for the main hazard.

3.1.2 Inner (IPAs) and Outer (OPAs) Protection Area Requirements

Inner: The IPA is the area closest to the building and creates a fuel managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well-maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

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.

Shrubs

- The creation of 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.

Grass

- 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.

Outer: An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- Tree canopy cover should be less than 30%; and
- Canopies should be separated by 2 to 5m.

Shrubs

- Shrubs should not form a continuous canopy; and
- Shrubs should form no more than 20% of ground cover.

Grass

- Grass should be kept mown to a height of less than 100mm; and
- Leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bushfires. Maintenance of the IPA and the OPA as described above should be undertaken regularly, particularly in advance of the bushfire season.

Asset Protection Lines (i.e.BAL-29 contour lines) for the eastern hazard can be seen in **Appendix 2**. **Appendix 3** shows the APZ lines for the northern and western hazards.

3.1.3 Operational Access and Egress

Access to and egress from each of the proposed lots will be via Silverdale Road. It is now proposed to build a perimeter road for the lots. Access is required to comply with Table 5.3b.

Table 5

Table 5.3b			
Performance criteria		**Acceptable Solution**	**Comment**
ACCESS – GENERAL REQUIREMENTS	**The intent may be achieved where:**		
	Firefighting vehicles are provided with safe, all weather access to structures	• Property access roads are two wheel drive, all weather roads. • Perimeter roads are provided for residential subdivisions of three or more allotments. • Subdivision of three or more allotments have more than one access in and out of the development. • Traffic management devices are constructed to not prohibit access by emergency services vehicles. • Maximum grades for sealed roads do not exceed 15° and an average grade of not more than 10 ° or other gradient specified by road design standards, whichever is the lesser gradient. • All roads are through roads. • Dead end roads are not recommended, but if	To comply Provided Complies To comply Will comply Complies N/A

		avoidable, 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. • Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road. • 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. • 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.	To comply N/A N/A
	The capacity of access roads is adequate for firefighting vehicles There is appropriate access to water supply	• The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23tonnes) bridges/causeways are to clearly indicate load rating. • Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression. • Hydrants are provided in accordance with the relevant clauses of AS2419.1:2005 – Fire Hydrant Installations Systems design, installation and commissioning; and • There is suitable access for a Category 1 fire appliance to within 4 metres of the static water supply where no reticulated supply is available.	To comply To comply To comply N/A

PERIMETER ROADS	Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating	• Are two-way sealed roads; • Minimum 8 metre carriageway width kerb to kerb; • Parking is provided outside of the carriageway width; • Hydrants are located clear of parking areas; • Are through roads and these are linked to the internal road system at an interval of no greater than 500 metres; • Curves of roads have a minimum inner radius of 6 metres; • The maximum grade road is 15° and average grade is 10°; • The road crossfall does not exceed 3°; • A minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches, is provided.	To comply To comply To comply To comply The section of the road directly exposed to the main hazard is less than 500m.To comply To comply To comply Will comply To comply
NON-PERIMETER ROADS	Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating	• Minimum 5.5 metres width kerb to kerb; • Parking is provided outside of the carriageway width; • Hydrants are located clear of parking areas; • Roads are through roads and these are linked to the internal road system at an interval of no greater than 500 metres; • Curves of roads have a minimum inner radius of 6 metres; • The road crossfall does not exceed 3°; • A minimum vertical clearance distance of 4 metres to any overhanging obstructions, including tree branches is provided.	N/A

Table 5.3b			
Performance criteria		**Acceptable Solution**	**Comment**
PROPERTY ACCESS	**The intent may be achieved where:**		
	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. In circumstances where this cannot occur the following requirements apply: • Minimum 4m carriageway width; • In forest, woodland and heath situations, rural property access roads have passing bays at every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay; • A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches; • Provide a suitable turning area in accordance with Appendix 3; • Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress; • The minimum distance between inner and outer curves is 6m; • The crossfall is not more than 10 degrees; • Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and • A development comprising more than three dwellings has access by dedication of a road and not by right of way.	Access maybe greater than 70m. If greater than 70m Property Access to comply with this table.

3.1.4 Services - Water, Gas and Electricity

As set out in *Planning for Bushfire Protection*, 2019, developments in bushfire prone areas must maintain a water supply for firefighting purposes.

It is assumed reticulated water supply and a hydrant supply, will be available and connected for the lots. Where hydrants are greater than 70m to all parts of a dwelling then a static water is required.

Table 6

Table 5.3c			
	Performance Criteria	**Acceptable Solutions**	**Comment**
WATER SUPPLIES	**The intent may be achieved where:**		
	Inadequate water supplies are provided for firefighting purposes	• Reticulated water supply is to be provided to the development where available. • A static water and hydrant supply are provided for non-reticulated developments or where reticulated water supply cannot be guaranteed. • Static water supplies shall comply with Table 5.3d of the NSW Planning for Bushfire Protection 2019.	The Project Manager advises that reticulated water is proposed for the site. To comply where applicable To comply where applicable
	Water supplies are located at regular intervals The water supply is accessible and reliable for firefighting operations	• Fire hydrant, spacing, design and sizing complies with the relevant clauses of the Australian Standard AS 2419.1 – 2005. • Hydrants are not located within any road carriageway. • Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter road.	To comply To comply To comply
	Flows and pressures are appropriate	• Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	To comply
	The integrity of the water supply is maintained	• All above ground water service pipes are metal, including and up to any taps. • Above ground water storage tanks shall be of concrete or metal.	To comply To comply where applicable
ELECTRICITY SERVICES	Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings Regular inspection of lines is undertaken to ensure they are not fouled by branches	• Where practical, electrical transmission lines are underground. • Where overhead electrical transmission lines are proposed: 1. Lines are installed with short pole spacing (30 metres) unless crossing gullies, gorges or riparian areas; and 2. 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.	To comply

GAS SERVICES	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	• Reticulated or bottle gas is installed and maintained in accordance with AS 1596:2014 – The storage and handling of LP Gas, the requirements of relevant authorities and metal piping is to be used. • All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation. • Connections to and from gas cylinders are metal. • Polymer-sheathed flexible gas supply lines are not used. • Above ground gas service pipes are metal, including and up to any outlets.	To comply

WATER SUPPLIES	The integrity of the water supply is maintained.	• All above ground water service pipes external to the building are metal, including and up to the taps.	To comply
	A static water supply is provided for firefighting purposes in areas where reticulated water is not available.	• Where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d; • A connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet; • Ball valve and pipes are adequate for water flow and are metal; • Supply pipes from tank to ball valve have the same bore size to ensure flow volume; • Underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank; • A hardened ground surface for truck access is supplied within 4m; • Above ground tanks are manufactured from concrete or metal; • Raised tanks have their stands constructed from non-combustible material or bush fire resisting timber (See Appendix F of AS3959); • Unobstructed access can be provided at all times;	To comply where applicable. To comply where applicable. To comply where applicable. To comply where applicable. To comply where applicable. To comply where applicable. To comply where applicable. To comply where applicable. To comply where applicable.

		• Underground tanks are clearly marked; • Tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; • All exposed water pipes external to the building are metal, including any fittings; • Where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bushfire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and • Fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.	To comply where applicable. To comply where applicable. To comply where applicable. N/A N/A

3.1.5 Landscaping

Landscaping is a major cause of fire spreading to buildings, and therefore any landscaping will need consideration when planning, to produce gardens that do not contribute to the spread of a bushfire.

When planning any future landscaping surrounding any proposed building or subdivision, consideration should be given to the following:

- The choice of vegetation – consideration should be given to the flammability of the plant and the relation of their location to their flammability and on-going maintenance to remove flammable fuels.
- Trees as windbreaks/firebreaks – Trees in the landscaping can be used as windbreaks and also firebreaks by trapping embers and flying debris.
- Vegetation management – Maintain a garden that does not contribute to the spread of bushfire.
- Maintenance of property – Maintenance of the property is an important factor in the prevention of losses from bushfire.

Appendix 4 of NSW Rural Fire Services, *Planning for Bushfire Protection*, 2019, contains standards that are applicable to the provision and maintenance of Asset Protection Zones.

For a complete guide to APZs and landscaping download the NSW RFS document Standards for Asset Protection Zones at the RFS *www.rfs.nsw.gov.au*.

3.2 Construction of Buildings

3.2.1 General

The deemed-to-satisfy provisions for construction requirements are detailed in AS 3953-2018.

The relevant Bushfire Attack Level and construction requirements have been determined in accordance with PBP, 2019 and AS 3959-2018.

3.2.2 AS3959 – 2018 Construction of Buildings in Bushfire Prone Areas

The following construction requirements in accordance with AS 3959 – 2018 Construction of Buildings in Bushfire Prone Areas is required for the bushfire attack categories.

3.2.3 Fences and Gates

Fences and gates may play a significant role in the vulnerability of structures during a bush fire.

With regard to new fences and gates:

a) All new fences in bush fire prone areas should be made of either hardwood or non-combustible material.
b) Where the fence is within 6m of the building or in areas of BAL 29, they should only be made of non-combustible material.

Table 7

Bushfire Attack Level (BAL)
BAL - LOW No construction requirements under AS 3959-2018
BAL - 12.5
BAL - 19
BAL - 29
BAL - 40
BAL - FZ

The following table indicates the Bushfire Attack Levels applicable once the recommended APZs have been established:

Table 8 – Categories of Attack/Construction Standard Assessment for the Proposed Subdivision

Aspect	**Hazard Vegetation**	**Slope**	**Min Distance to Hazard once APZ Applied**	**AS 3959-2018 Bushfire Attack Level (BAL)**
North	Grassland Coastal Valley Woodland	0-5° Downslope 0° Flat	11m Approx 70m	BAL 29 Bal 12.5
East	Coastal Valley Woodland	26-29° Downslope	See **Note 1**	BAL 29
West	Forest then grassland	5-10° Downslope	31m	BAL 29

Note 1 - Due to the slope being in excess of 20° Performance Reporting is required for the slope to the east. The modelling has used the RFS GIS Vegetation Management Mapping and the Coastal Valley Woodland Formation. Further modelling and investigation into the fuel loads of the hazard may reduce the Asset Protection Zone nominated for the planning proposal.

Included are two (2) models for the Coastal Valley Woodland Formation:

a. The separation distance including flame length.
b. The second separation distance excluding flame length.

Both these separation distances are shown on the Civil Works Plan and both models were completed using Bush Fire Attack Assessor (Couch V4.1). See **Appendix 4** for modelling.

4.0 STRATEGIC PLANNING CONSIDERATIONS

It is recognized that the proposal is a rezoning and consideration has to be given to Section 4 and particular Table 4.2.1 of PBP, 2019.

With respect to the rezoning it is 9 x lots only and is situated on the edge of residential development of The Oaks.

Table 4.2.1 of PBP, 2019

Bushfire Strategy Study		
Issue	**Detail**	**Assessment Considerations**
Bushfire Landscape Assessment	A bushfire landscape assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	a) The bushfire hazards in the surrounding area includes: • Vegetation • Topography • Weather b) The potential fire behaviour that might be generated based on the above; c) Any history of bushfire in the area; and d) Potential fire runs into the site and the intensity of such fire runs.
Land Use Assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	a) The risk profile of different areas of the development based on the above landscape study; b) The proposed land use zones and the resultant permitted land uses; c) The most appropriate siting of different land uses based on risk profiles within the site (i.e. not

		locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and d) The impact of the siting of these uses on APZ provision.
Access and Egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout	a) The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile; b) The location of key access routes and direct of travel; and c) The potential for development to be isolated in the event of a bushfire.
Emergency Service	An assessment of the future impact of new development on emergency services provision	a) Consideration of the increase in demand for emergency services responding to a bushfire emergency (including the need for new stations/bridges); and b) Impact on the ability of emergency services to carry out fire suppression in a bushfire emergency.
Infrastructure	An assessment of the issues associated with infrastructure provision	a) The ability of the reticulated water system to deal with major bushfire event (particularly in terms of water pressure); and b) life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.
Adjoining Land	The impact of new development on adjoining landowners and their ability to undertake bushfire management	a) Consideration of the implications of a change in land use on adjoining land including; • The ability of adjoining and nearby land to carry a bushfire; and • Consideration of increased pressure on adjoining landowners to introduce or increase BPMs through the implementation of Bushfire Management Plans as a result of the changes in land use.

With respect to Table 4.2.1:

a. Bush Fire Landscape Assessment

Specific reporting has been undertaken with respects to the hazards surrounding the site.

b. Land Use Assessment

The proposal is one dimensional and will consider residential only, therefore the higher risk profile uses do not need to be considered.

c. Access and Egress

There is alternate access/egress is available from the subdivision and there is also alternate access when leaving the subdivision. The proposed development is located on the edge of the existing residential areas and the safe areas of The Oaks.

d. Emergency Services

There are 9 new dwellings and the location of the northern boundary provides for Brigade monitoring of any fire coming from the north towards the town.

e. Infrastructure

The Project Manager has had some early discussions with Sydney Water for the reticulated supply.

f. Adjoining Land

It is not considered that the new development will have an effect on the adjoining landowners and their ability to undertake bush fire management. The dwellings to the south of the proposal will have a reduced risk from the existing adjoining grassland hazard.

5.0 EMERGENCY EVACUATION PLANNING

It is recommended that the individual owners develop a bushfire survival plan with respect to the proposed lots.

The decision to stay and defend or to leave should be made well in advance of the arrival of the bushfire.

Any bushfire survival plan should consider the advice offered by the RFS website *www.rfs.nsw.gov.au*.

6.0 REQUIREMENTS

The following requirements are considered to be integral to this bushfire risk assessment:

1. An Asset Protection Zones as detailed in Section 3.1.1 of this report are to be provided.
2. The proposed subdivision is to comply with the relevant performance criteria/acceptable solutions as provided for by PBP, 2019.
3. Adopt landscaping principals in accordance with NSW Rural Fire Services, PBP, 2019.

7.0 OTHER CONSIDERATIONS

Table 9

Environmental/Heritage Feature	Comment
Riparian Corridor	Not considered in this report
SEPP 14 – Coastal Wetland	Not considered in this report
SEPP 26 – Littoral	Not considered in this report
SEPP 44 – Koala Habitat	Not considered in this report
Areas of geological interest	Not considered in this report
Environment protection zones	Not considered in this report
Land slip	Not considered in this report
Flood prone land	Not considered in this report
National Park Estate or other reserves	Not considered in this report
Threatened Species, populations, endangered ecological communities and critical habitat	Not considered in this report
Aboriginal Heritage	Not considered in this report

8.0 CONCLUSION

It is suggested that with the implementation of this report, and its recommendations, that the bushfire risk is manageable and will be consistent with the acceptable bushfire protection measure solutions, provided for in NSW Rural Fire Services, PBP, 2019.

The report provides that the required APZ's can be achieved and that the proposed subdivision can be constructed so as to comply with the requirements of AS 3959-2018 and PBP, 2019.

This report is however contingent upon the following assumptions and limitations:

Assumptions

1. For a satisfactory level of bushfire safety to be achieved, regular inspection and testing of proposed measures, building elements and methods of construction, specifically nominated in this report, is essential and is assumed in the conclusion of this assessment.
2. There are no re-vegetation plans in respect to hazard vegetation and therefore the assumed fuel loading will not alter.
3. It is assumed that the building works will comply with the DTS provisions of the BCA including the relevant requirements of Australian Standard 3959 – 2018.
4. The proposed subdivision is constructed and maintained in accordance with the risk reduction strategy in this report.
5. The vegetation characteristics of the subject site and surrounding land remains unchanged from that observed at the time of inspection.

Limitations

1. The data, methodologies, calculations and conclusions documented within this report specifically relate to the proposed subdivision and must not be used for any other purpose.
2. A reassessment will be required to verify consistency with this assessment if there is any alterations and/or additions, or changes to the risk reduction strategy contained in this report.

Regards

Tim Mecham
Midcoast Building and Environmental

9.0 DISLCLAIMER

This report is not intended for or to be used where aluminium composite panels are proposed. The report is not to be construed as an assessment of the building material or compliance with the recommended bushfire attack level/s.

10.0 REFERENCES

NSW Rural Fire Services, ***Planning for Bushfire Protection***, 2019
AS 3959-2018 ***Construction of Buildings in Bushfire Prone Areas***
Keith David 2004, Ocean ***Shores to Desert Dunes, The Native Vegetation of New South Wales and the ACT***, Department of Environment and Conservation
NSW State Government (1997) Rural Fires Act 1997
NSW Rural Fire Service – ***Guideline for Bushfire Prone Land Mapping 2002***

APPENDIX 1 – RFS reply to Fire Design Brief/Pre Development

NSW GOVERNMENT

NSW RURAL FIRE SERVICE

Wollondilly Shire Council
PO Box 21
PICTON NSW 2571

Your reference: S/2023/6/1
Our reference: SPI20231005000133

ATTENTION: Rebecca Connor

Date: Thursday 26 October 2023

Dear Sir/Madam,

Strategic Planning Instrument
Draft LEP – Draft Proposal
Amendments to subdivision land zoning, lot size, and heights of buildings on the subject site with the concept plan of 17 rural-residential allotments and associated infrastructure.

I refer to your correspondence dated 05/10/2023 inviting the NSW Rural Fire Service (NSW RFS) to comment on the above Strategic Planning document.

The NSW RFS has considered the information submitted and provides the following comments.

The RFS does not support the concept proposal in its current form. The following concerns are raised in relation to the proposed design, which should be addressed in a supporting bush fire consultant's report:

- A review of the information provided indicates that there are no significant site or environmental constraints that warrant deviation from the acceptable solutions for a residential subdivision as detailed in *Planning for Bush Fire Protection 2019* (PBP 2019). In this regard, appropriate justification should be provided to demonstrate compliance of the layout with the performance criteria for the relevant bush fire protection measure as outlined in Chapter 5 of PBP 2019, for hazard assessment and access in this instance, based on the bush fire risk profile.

- The following factors need to be considered and appropriately addressed in the bush fire report:
  - The use of fuel loads for vegetation classes based on interpretation of Section A1.9 and Table A1.9 (ie remnant classification to use rainforest fuel loads) as part of radiant heat modelling is not acceptable, unless substantiated in terms of presence and extent of the identified species to be deemed as the predominant hazard. The asset protection zones (APZs) applicable to rainforest, by treating the hazard as remnant, can be used as a deemed-to-satisfy solution in accordance with Table A1.12.5 of PBP 2019.
    - Therefore, further supporting evidence should be provided to substantiate the fuel loads used in radiant heat modelling, such as an ecologist's report to verify the predominant vegetation class. Available RFS GIS vegetation mapping categorises the hazard on the eastern aspect as Coastal Valley Grassy Woodland formation.

1

Postal address
NSW Rural Fire Service
Locked Bag 17
GRANVILLE NSW 2142

Street address
NSW Rural Fire Service
4 Murray Rose Ave
SYDNEY OLYMPIC PARK NSW 2127

T (02) 8741 5555
F (02) 8741 5550
www.rfs.nsw.gov.au

- The use of the Short Fire Run methodology to assess the eastern hazard may be considered as part of a performance based solution for the proposed development, however the effects of steep slopes on fire behaviour need to be addressed and substantiated:
  - The implication of the high effective slope being around 30° down slope;
  - The risk and likelihood of the fire reaching the canopy due to steep slopes.

- The substitution of a perimeter road with a fire trail for a portion of the site is not considered appropriate, unless justified to ensure safety to fire fighters and evacuating residents based on the potential bush fire risk as well as ongoing management and maintenance of the road being assured. As stated in Section 3.4.4 Fire Trails in PBP 2019 '*A fire trail is not a substitute for a road, nor is it considered an appropriate trade-off for the provision of a perimeter, non-perimeter or property road access requirements*'.

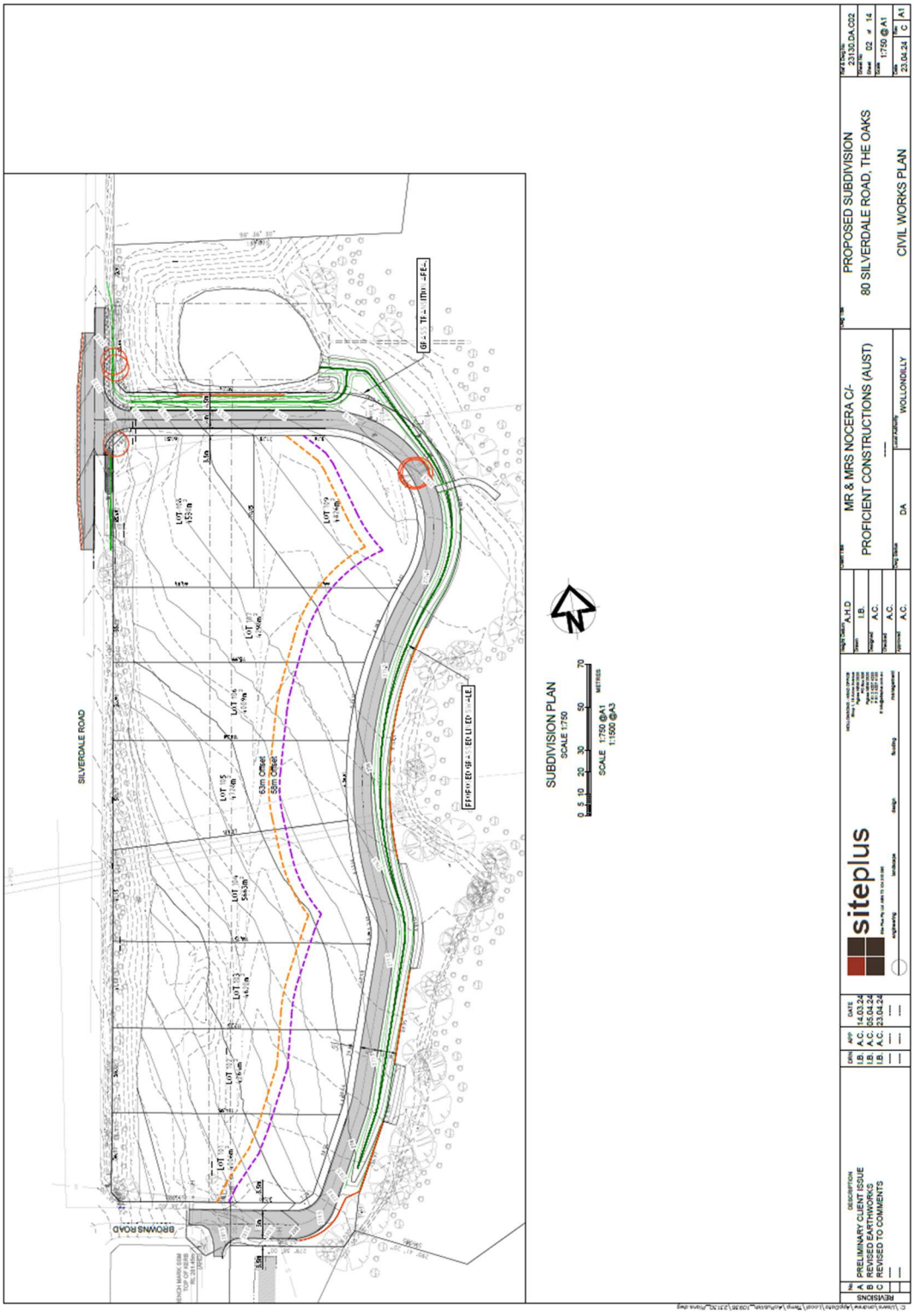
For any queries regarding this correspondence, please contact Adam Small on 1300 NSW RFS.

Yours sincerely,

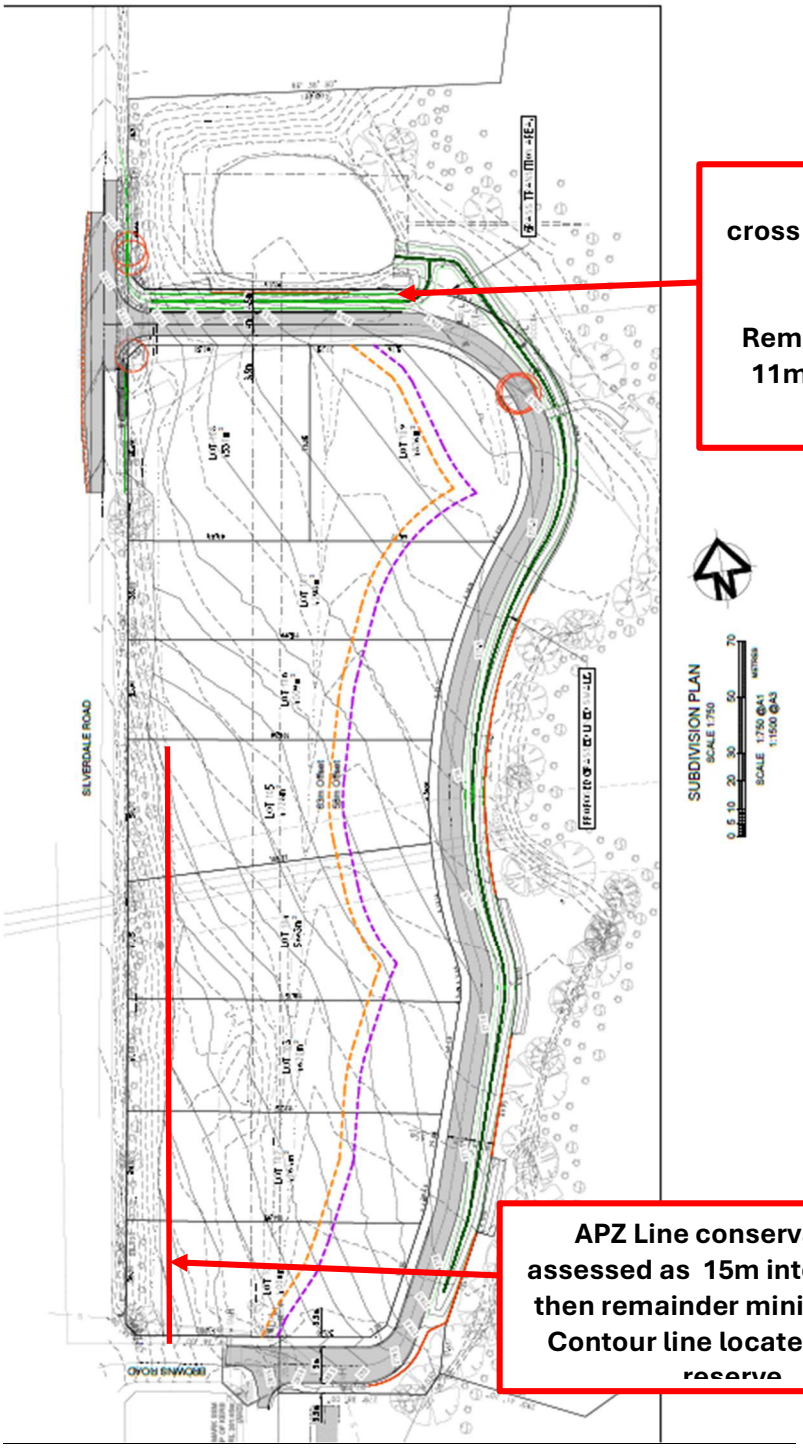
Bryce Pascoe
Supervisor Development Assessment & Plan
Built & Natural Environment

2

Appendix 2 – Showing Lot Layout and APZ line from Eastern Hazard calculated by the Engineer

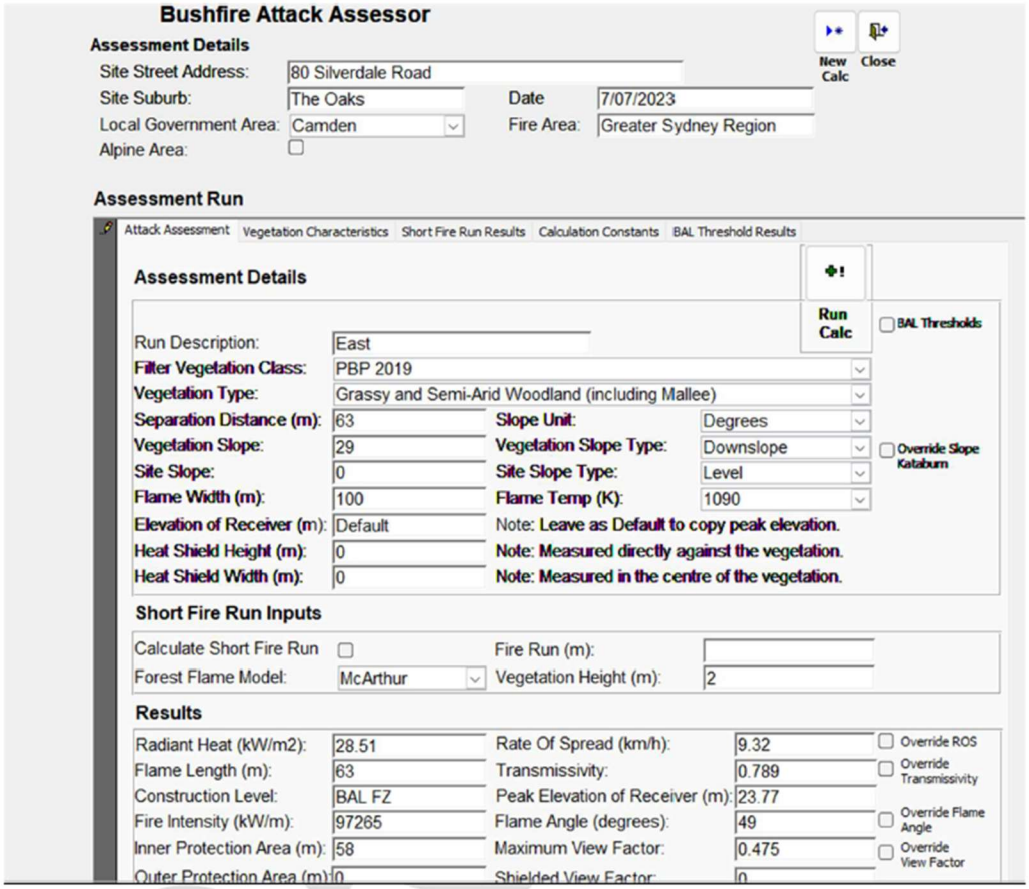


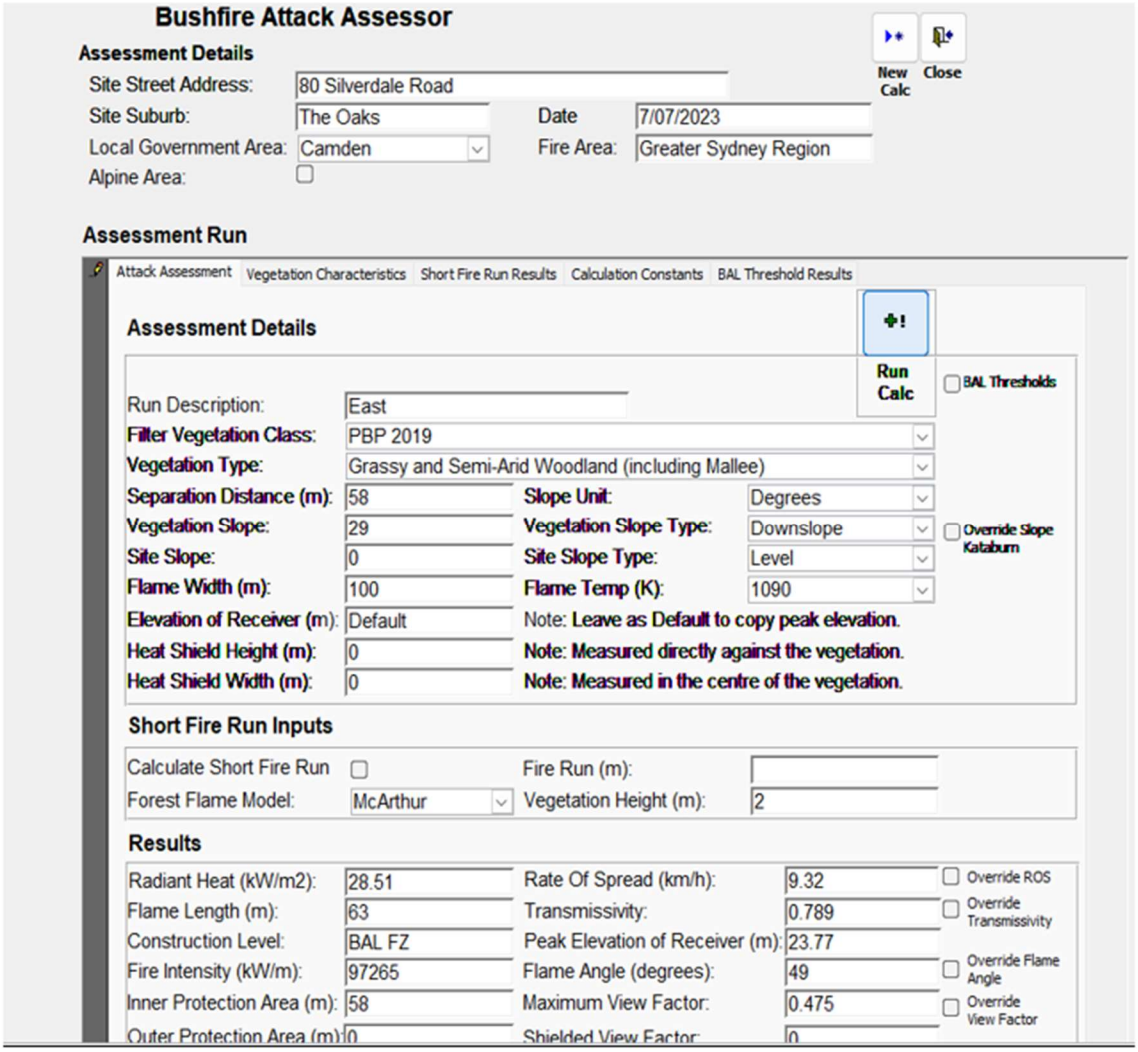
Appendix 3 – Plan of APZs to the north and west



Not to scale indicative only

APPENDIX 4


Bushfire Attack Assessor
Assessment Details
Site Street Address: 80 Silverdale Road
Site Suburb: The Oaks
Date 7/07/2023
Local Government Area: Camden
Fire Area: Greater Sydney Region
Alpine Area:
New Calc
Close
Assessment Run
Attack Assessment
Vegetation Characteristics
Short Fire Run Results
Calculation Constants
BAL Threshold Results
Assessment Details
Run Calc
BAL Thresholds
Run Description: East
Filter Vegetation Class: PBP 2019
Vegetation Type: Grassy and Semi-Arid Woodland (including Mallee)
Separation Distance (m): 63
Slope Unit: Degrees
Vegetation Slope: 29
Vegetation Slope Type: Downslope
Override Slope Kataburn
Site Slope: 0
Site Slope Type: Level
Flame Width (m): 100
Flame Temp (K): 1090
Elevation of Receiver (m): Default
Note: Leave as Default to copy peak elevation.
Heat Shield Height (m): 0
Note: Measured directly against the vegetation.
Heat Shield Width (m): 0
Note: Measured in the centre of the vegetation.
Short Fire Run Inputs
Calculate Short Fire Run
Fire Run (m):
Forest Flame Model: McArthur
Vegetation Height (m): 2
Results
Radiant Heat (kW/m2): 28.51
Rate Of Spread (km/h): 9.32
Override ROS
Flame Length (m): 63
Transmissivity: 0.789
Override Transmissivity
Construction Level: BAL FZ
Peak Elevation of Receiver (m): 23.77
Fire Intensity (kW/m): 97265
Flame Angle (degrees): 49
Override Flame Angle
Inner Protection Area (m): 58
Maximum View Factor: 0.475
Override View Factor
Outer Protection Area (m): 0
Shielded View Factor: 0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