

Bushfire Assessment

Residential Subdivision

**190 Raby Road,
Gledswood Hills**

Legacy Property

27 February 2023

(Ref: 22063)

report by
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1 Introduction

Street or property name:	190 Raby Road	
Suburb, town or locality:	Gledswood Hills	Postcode: 2557
Lot/DP no:	Lot 102 DP 122899	
Local Government Area:	Camden Council	
Type of development:	Residential subdivision	

1.1 Background

Legacy Property commissioned Peterson Bushfire to prepare a Bushfire Assessment Report for a proposed residential subdivision located on bushfire prone land in Gledswood Hills, south-west Sydney. This report presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation and policy.

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

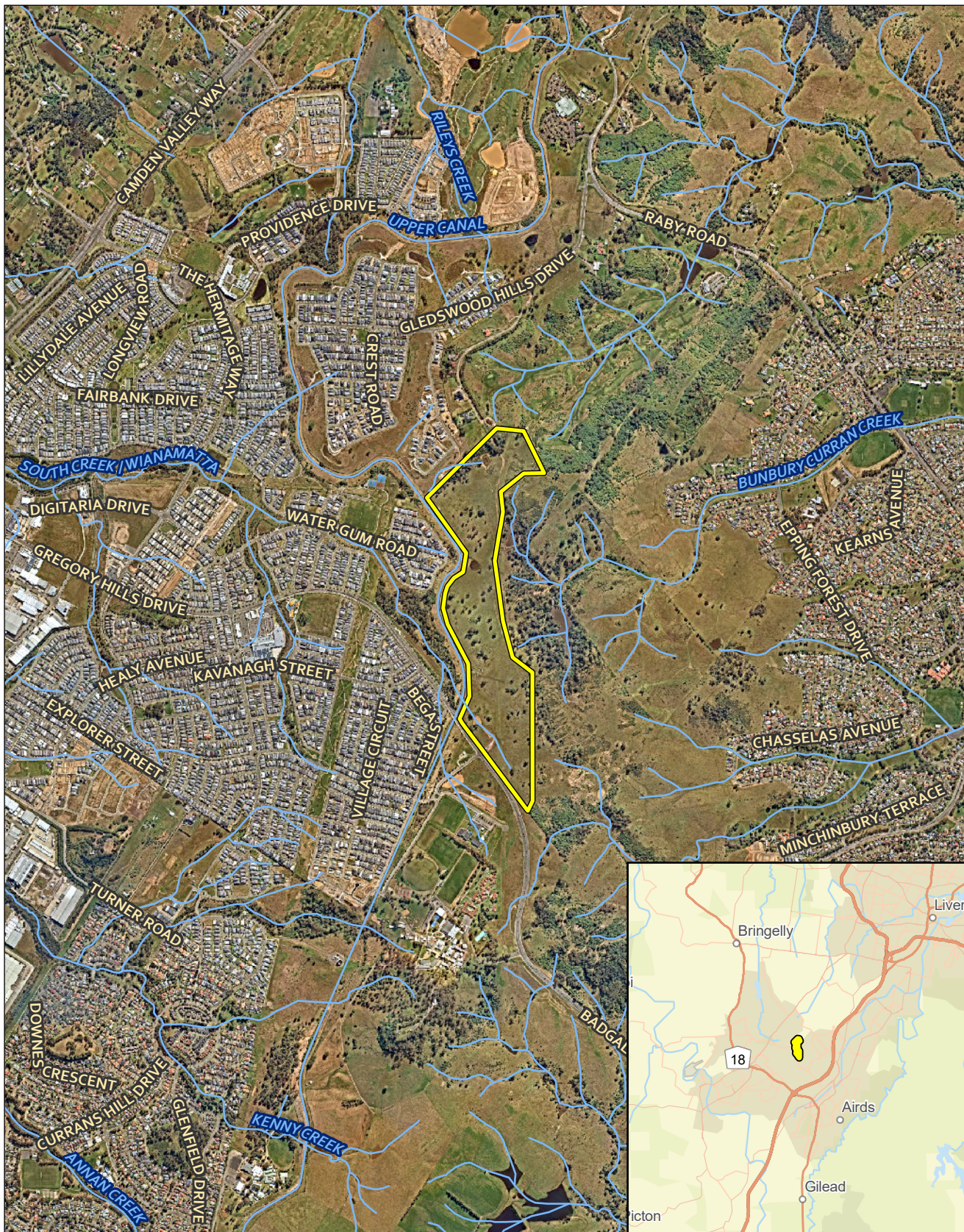
1.2 Location of subject land and description of proposal

The subject land is a single lot approximately 40 hectares in size located alongside the Sydney Water Supply Channel in Gledswood Hills. Managed lands generally adjoin the subject land to the north, west and south, whilst scattered woodland and grassland adjoins to the east.



The proposal consists of the subdivision of the subject land into residential lots across the R2 and C4 zones as well as the construction of public roads. The plan of subdivision is included as Figure 2.

1.3 Assessment requirements

The subject land is identified as 'bushfire prone land' on the Camden Bushfire Prone Land Map (refer to Figure 3). Section 4.46 *Environmental Planning and Assessment Act 1979* requires a bushfire assessment of residential subdivision proposals on bushfire prone land following the process and methodology set out within Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2022* and the NSW Rural Fire Service (RFS) document *Planning for Bush Fire Protection 2019* (referred to as 'PBP' throughout this report).



Legend

-  Watercourse
-  Subject Land




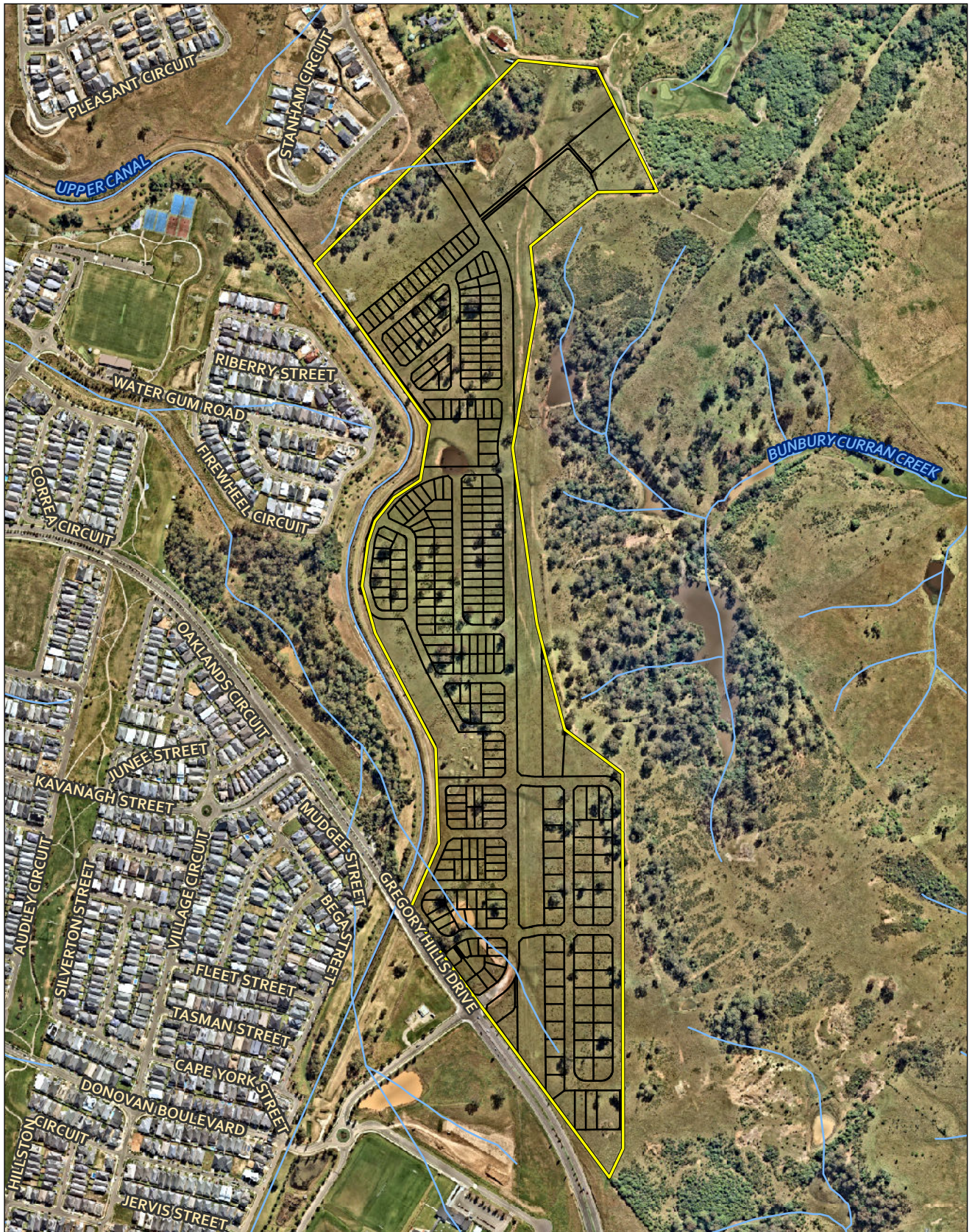




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 0 125 250 500
 Metres

Figure 1: Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56
 Imagery: © Nearmap



Legend

-  Watercourse
-  Subject Land
-  Cadastre



Date: 30/01/2023

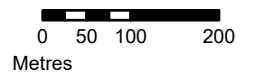
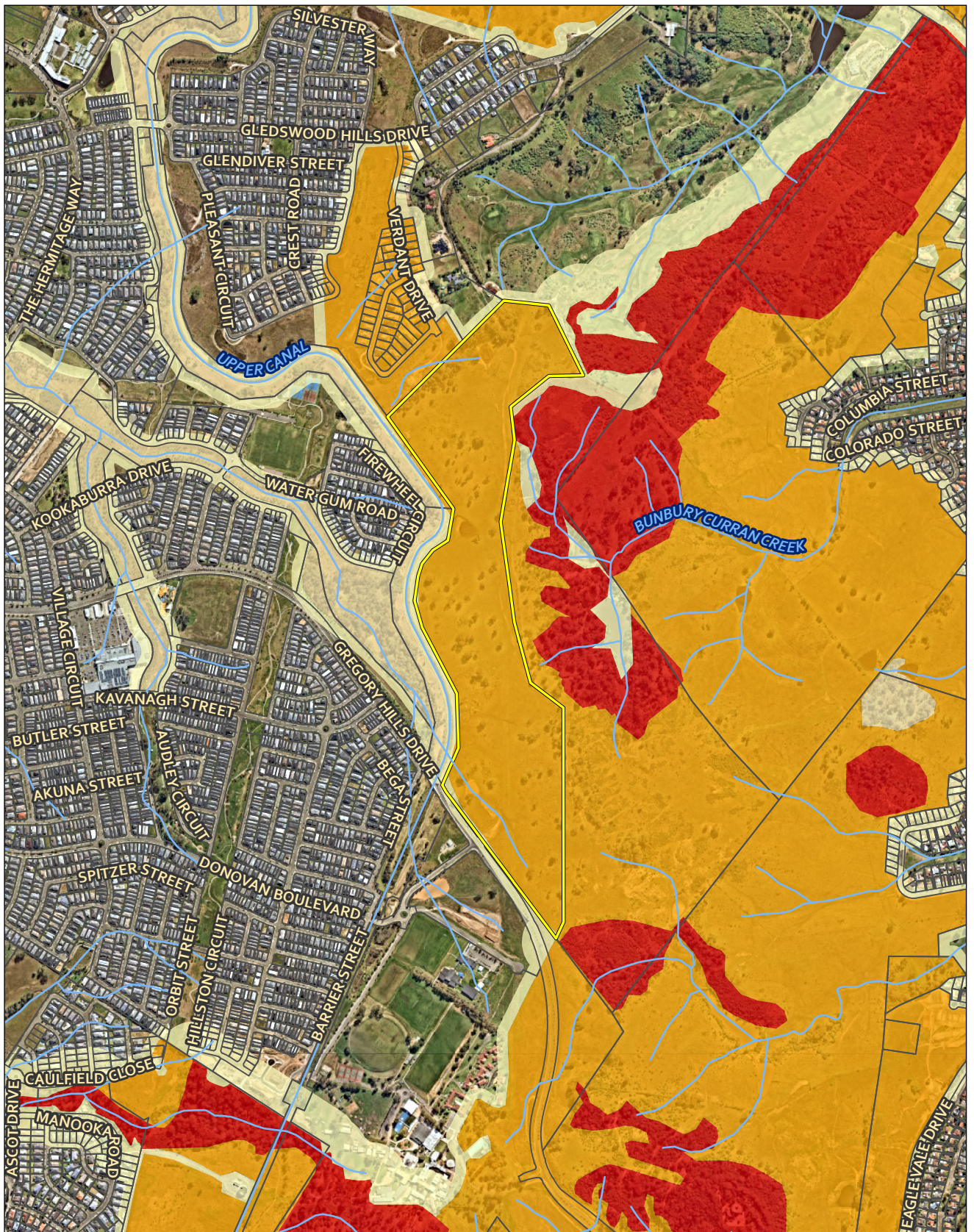


Figure 2: The Proposal

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap






Legend

-  Watercourse
-  Subject Land
-  Cadastre
-  Vegetation Category 2
-  Vegetation Category 3
-  Vegetation Buffer

Bushfire Prone Land

-  Vegetation Category 1

Figure 3: Bushfire Prone Land



DKGIS
 Date: 2/11/2022

 Metres

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

2 Bushfire hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as Asset Protection Zone (APZ) location and dimension. The following sub-sections provide a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire hazard that may affect bushfire behaviour at the site.

2.1 Predominant vegetation

The vegetation within 140 m of the subject land has been assessed in accordance with the methodology specified within PBP. Figure 4 maps the current distribution of the identified hazards. A description of the hazards is provided below and listed within Table 2.

- ***Woodland to the east***

Woodland vegetation within C3 zoned land adjacent the subject land is the primary bushfire threat to the proposal.

- ***Woodland to the west***

Within the western margins of the canal land is scattered woodland (low hazard) and a larger area of woodland beyond. The canal and land immediately either side is classified managed land, providing adequate separation between the woodland and the subject land.

- ***Woodland within the C4 lots at northern end***

A patch of woodland will be retained within the proposed large C4 lots at the northern end of the subject land.

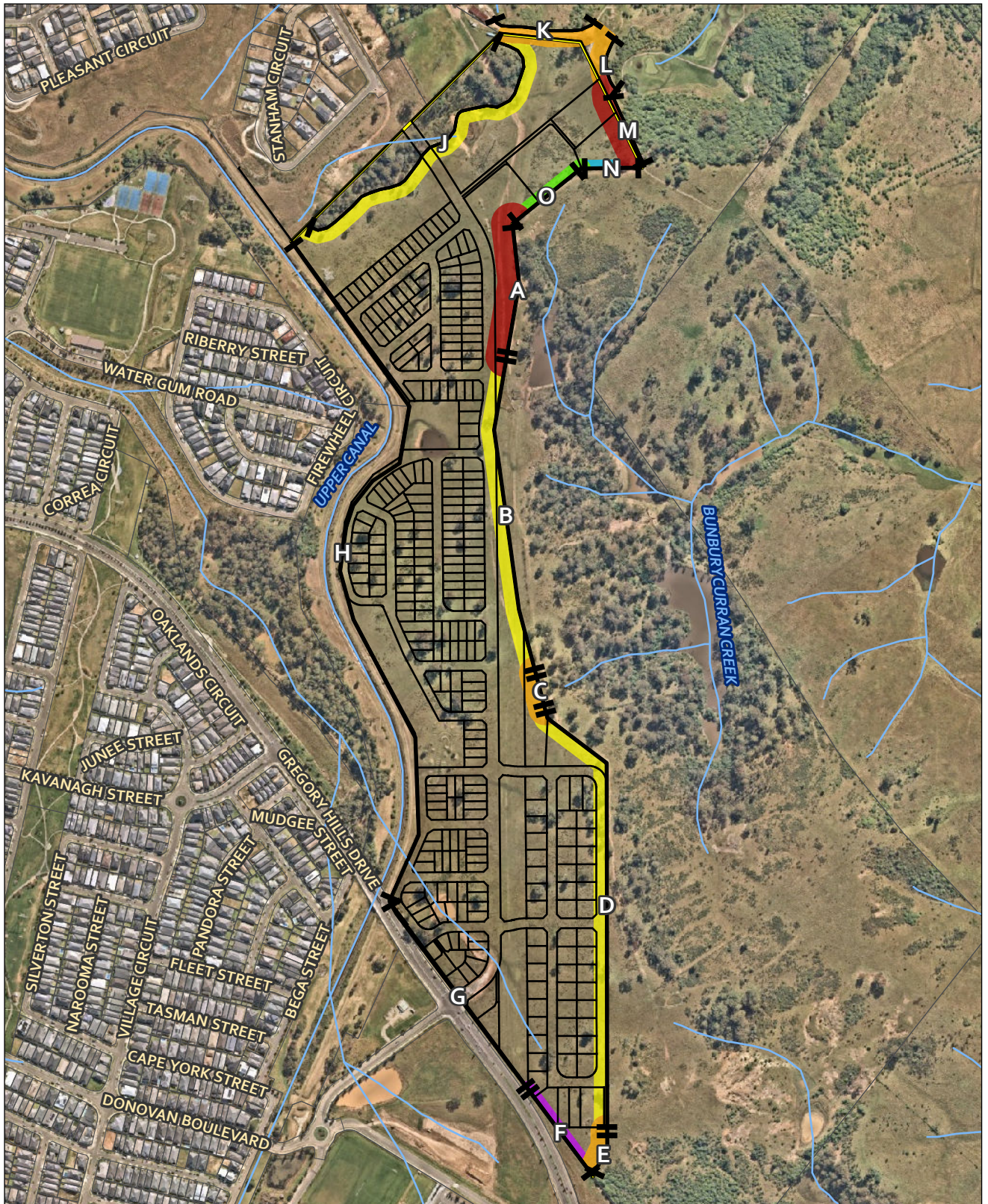
- ***Grassland to the north and south***

An area of grassland exists adjacent the eastern boundary at the northern end and at the southern end between the subject land and Gregory Hills Drive.

2.2 Effective slope

The 'effective slope' influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most significantly influence fire behaviour where the hazard occurs. The slope was determined using a 2 m contour layer as shown on Figure 4.

The slope underneath the identified hazards is within all of the PBP downslope classes. The representative slope classes are listed within Table 2.



Legend

- | | | |
|---------------|------------------------------|-----------------------------|
| APZ Interface | Asset Protection Zone | Asset Protection Zone - 20m |
| Watercourse | Asset Protection Zone - 12m | Asset Protection Zone - 25m |
| Subject Land | Asset Protection Zone - 13m | Asset Protection Zone - 32m |
| Cadastre | Asset Protection Zone - 15m | |



Date: 30/01/2023

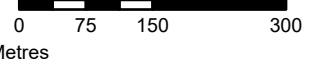


Figure 4: Bushfire Hazard Analysis and Asset Protection Zone

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

3 Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for residential subdivision. The measures required to be assessed are listed in Table 1 below and are discussed in detail in the remainder of this section.

Table 1: PBP bushfire protection measures

Measures	Considerations
Asset Protection Zones (APZ)	Location and dimension of APZ building setbacks from vegetation including prescriptions of vegetation management within the APZ.
Access	Assessment to include access and egress, perimeter access and design standards of public roads.
Water supply and other utilities	List requirements for reticulated water supply and hydrant provisions, and any static water supplies for fire-fighting.

3.1 Asset Protection Zones (APZ)

Using the vegetation and slope information presented in Section 2 and mapped on Figure 4, Asset Protection Zones (APZ) suitable for residential subdivision have been calculated. The APZ determination is listed in Table 2 on the following page and the APZ is mapped on Figure 4.

All required APZs are accommodated within the subject land with the exception of APZs K and L which are partly accommodated by the managed land adjacent within the Macarthur Grange Golf Course, and APZs H and I which are provided by Gregory Hills Road and the canal easement, respectively.

Where APZs are situated within proposed lots, the APZ is to be placed on title by way of a section 88B easement restricting placement of a dwelling.

Table 2: APZ determination

Hazard interface ¹	Vegetation ²	Slope ³	Required APZ ⁴	How will the APZ be accommodated
A	Woodland	Downslope 15-20°	32 m	C4 zoned land and perimeter road
B	Woodland	Downslope 5-10°	20 m	C4 zoned land and perimeter road
C	Woodland	Downslope 10-15°	25 m	C4 zoned land
D	Woodland	Downslope 5-10°	20 m	Perimeter road
E	Woodland	Downslope 10-15°	25 m	C4 zoned land
F	Grassland	Downslope 0-5°	12 m	C4 zoned land
G	Managed	Not required	Not required	Gregory Hills Road
H	Managed	Not required	Not required	Canal easement
J	Woodland	Downslope 5-10°	20 m	C4 zoned land
K	Woodland	Downslope 10-15°	25 m	C4 zoned land and adjacent golf course
L	Woodland	Downslope 10-15°	25 m	C4 zoned land and adjacent golf course
M	Woodland	Downslope 15-20°	32 m	C4 zoned land
N	Grassland	Downslope 5-10°	13 m	C4 zoned land
O	Grassland	Downslope 10-15°	15 m	C4 zoned land

¹ Hazard interface as mapped on Figure 4.

² Predominant vegetation classification over 140 m from subject land.

³ Effective slope assessed where the bushfire hazard occurs.

⁴ APZ required by Table A1.12.2 of Planning for Bush Fire Protection 2019.

3.2 Vegetation management

Except where vegetation is to be retained, all proposed lots and roads are to be maintained to comply with the standards of an Inner Protection Area (IPA) as described by Section A4.1.1 of PBP. Proposed landscaping, including street trees, is also to comply.

The IPA requirements stated within PBP are repeated below:

A4.1.1 Inner Protection Areas (IPAs)

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 defensible 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**
 - *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.*
- **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.*

3.3 Access

3.3.1 Alternate access and egress

PBP requires an access design that enables safe evacuation whilst facilitating adequate emergency and operational response. All bushfire prone areas should have an alternate access or egress option depending on the bushfire risk, the density of the development, and the chances of the road being cut by fire for a prolonged period.

In the interim, the subdivision will have a single public access road point to Gregory Hills Drive at the southern end. An alternate and emergency access point to Raby Road at the northern end of the subdivision currently exists and can be maintained as an emergency access point until the proposed link through to Verdant Drive to the north is constructed. The emergency access road is to be maintained trafficable by a Category 1 tanker.

The subdivision layout satisfies PBP access objectives in relation to access and egress.

3.3.2 Perimeter access

The proposed road layout provides compliant perimeter access to the woodland hazards to the east. The larger C4 lots at the northern end of the subdivision do not require a specific perimeter road due to the large size of the lots and the ability for fire authorities to individually access each lot.

3.3.3 Design and construction standards

The proposed roads are to comply with the PBP Acceptable Solutions (Table 5.3b of PBP) for the design and construction of roads in bushfire prone areas as listed below.

PBP design standards for roads servicing residential subdivision:

- *Property access roads are two-wheel drive, all weather roads.*
- *Perimeter roads are provided for residential subdivisions of three or more allotments.*
- *Subdivisions of three or more allotments have more than one access in an out of the development.*
- *Traffic management devices are constructed to not prohibit access by emergency service vehicles.*
- *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.*
- *All roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends 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 is 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 or heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.*
- *The capacity of perimeter and non-perimeter road surfaces and any bridges and causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); Bridges/causeways 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 AS 2419.1:2005.*
- *There is suitable access for a Category 1 fire appliance to within 4 m of the static water supply where no reticulated supply is available.*
- *Perimeter roads are:*
 - *two-way sealed roads;*
 - *8 m carriageway width kerb to kerb;*
 - *parking is provided outside of the carriageway width;*
 - *hydrants are located clear of parking reserves;*
 - *there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m;*
 - *curves of roads have a minimum inner radius of 6 m;*
 - *the maximum road grade is 15° and average grade is 10°;*
 - *the road crossfall does not exceed 3°;*
 - *a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.*
- *Non-perimeter roads are:*
 - *Minimum 5.5 m width kerb to kerb;*
 - *parking is provided outside of the carriageway width;*
 - *hydrants are located clear of parking reserves;*
 - *there are through roads, and these are linked to the internal road system at an interval of no greater than 500 m;*
 - *curves of roads have a minimum inner radius of 6 m;*
 - *the road crossfall does not exceed 3°;*
 - *a minimum vertical clearance of 4 m to any overhanging obstruction, including tree branches, is provided.*

3.4 Water supply and utilities

3.4.1 Water supply

Fire hydrants are to be installed along the road reserves to comply with *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419) so that all sides of a building envelope are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).

3.4.2 Electricity supply

Electricity will be provided below ground, therefore complying with PBP.

3.4.3 Gas supply

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

4 Conclusion and recommendations

4.1 Summary

The proposal consists of a residential subdivision on bushfire prone land in Gledswood Hills. The bushfire hazard consists primarily of woodland adjacent on downslopes to the east. APZs are proposed to ensure compliance and perimeter roads are included where necessary. The single public access road is complemented by an interim emergency access road that will be replaced by a second public road link once adjoining land is developed.

4.2 Conclusion

This report presents an assessment of a residential subdivision at 190 Raby Road, Gledswood Hills. The assessment demonstrates that the proposal, together with the recommendations (see below), complies with *Planning for Bush Fire Protection 2019*.

4.3 Recommendations

The recommendations made within this assessment are repeated below:

1. APZs are to be applied to the subdivision as shown on Figure 4. Where APZs are situated within proposed lots, the APZ is to be placed on title by way of a section 88B easement restricting placement of a dwelling.
2. Except for where vegetation is to be retained, all proposed lots and roads are to be maintained to comply with the standards of an Inner Protection Area (IPA) as described by Section A4.1.1 of PBP. Proposed landscaping, including street trees, is also to comply.
3. The existing road to Raby Road at the northern end of the subdivision is to be maintained as an emergency access point until the proposed link through to Verdant Drive to the north is constructed. The emergency access road is to be maintained trafficable by a Category 1 tanker.
4. The proposed roads are to comply with the PBP Acceptable Solutions (Table 5.3b of PBP) for the design and construction of roads in bushfire prone areas.
5. Fire hydrants to be installed along road reserves to comply with AS 2419.1 – *2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).
6. Any gas services are to be installed and maintained in accordance with AS/NZS 1596-2014 *The storage and handling of LP gas*.



David Peterson



References

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

Standards Australia. 2005. *Fire hydrant installations - System design, installation and commissioning*, AS2419.1, Fourth edition 2005, Standards Australia International Ltd, Sydney.

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

