



# BUSH FIRE ASSESSMENT REPORT

## GOOGONG PLANNING PROPOSAL

Lot 2 DP 1231713

Assessment of a planning proposal to increase  
residential land at Googong Township

Prepared for Googong Township Pty Ltd

12.7.23

Final Issue



## *EXECUTIVE SUMMARY*

EMBER Bushfire Consulting has been engaged by Googong Township Pty Ltd to prepare a Bushfire Strategic Study (BFSS) in support of a planning proposal at Googong. The planning proposal seeks minor amendments to the Local Environmental Plan as it applies to certain land in Googong. If successful, the proposal will result in a moderate expansion of proposed residential areas to the south and east of Neighbourhoods 1B and 3-5. In anticipation, a concept subdivision plan is proposed and is the centre of this bushfire assessment.

The proposed subdivision is located on bushfire prone land as declared by the Queanbeyan-Palerang Regional Council (QPRC) and NSW RFS.

This assessment adopts a methodology provided under the requirements of Section 100B of the Rural Fires Act and the Rural Fire Regulations 2013 to assess the adequacy for bushfire protection of the subdivision as planned under Planning for Bushfire Protection 2019 (PBP 2019).

The report establishes the level of bushfire threat to the subject site and examines bushfire protection measures for the proposal to satisfy the broad aims and objectives of PBP 2019 detailed in Chapter 5 – Residential and Rural Residential Subdivisions and includes asset protection zones, landscaping, access, water supplies, electricity and gas and construction standards.

The recommendations contained in this report are designed to inform the planning proposal stage only, not for DA purposes.

Due to anticipated future vegetation formation being woodland and forest, the surrounding environment has the potential to possess a moderate to high bushfire threat level. This threat however can be moderated to an acceptable level by the adoption of the standard suite of protection measures offered by PBP 2019 and for which the proposed development can largely comply.

Asset Protection Zones proposed will ensure the proposed lots provide adequate separation from areas of hazard vegetation and are not exposed to excessive radiant heat levels.

Access to the subject site is well provided for and will largely comply with the acceptable solutions set out in PBP 2019.

Specific Firefighting water supplies are recommended to meet the specific requirements of PBP 2019.

Based on the bushfire assessment and the recommendations contained in this report, the planning proposal is deemed capable of meeting the underlying principles of strategic planning and should be supported.

## CERTIFICATION STATEMENT

|                                                                                              |                                                                                                                                    |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Document Title:</b>                                                                       | Bushfire Assessment Report<br>Planning Proposal, Googong                                                                           |
| <b>EMBER Reference:</b>                                                                      | JD.168.22                                                                                                                          |
| <b>Lot &amp; DP Number</b>                                                                   | Lot 2 DP 1231713                                                                                                                   |
| <b>Street Address</b>                                                                        | Googong Road, Googong                                                                                                              |
| <b>Local Government Area</b>                                                                 | Queanbeyan Palerang Regional Council                                                                                               |
| <b>Description of the development</b>                                                        | Planning proposal                                                                                                                  |
| <b>Type of assessment under<br/>Planning for Bushfire<br/>Protection (2019)</b>              | Section 4 – Bush Fire Strategic Study                                                                                              |
| <b>Is referral of the proposal to the<br/>NSW RFS required?</b>                              | Yes – Direction 4.4 of the EP&A Act<br>(1979)                                                                                      |
| <b>Has a pre-DA lodgment or bush<br/>fire design brief been provided<br/>to the NSW RFS?</b> | No                                                                                                                                 |
| <b>Highest radiant heat flux<br/>determined for indicative<br/>development.</b>              | <29kW/m <sup>2</sup>                                                                                                               |
| <b>Highest level of construction<br/>applicable:</b>                                         | Bushfire Attack Level (BAL) -29                                                                                                    |
| <b>Accreditation Scheme / Level of<br/>accreditation</b>                                     | Bushfire Planning and Design (BPAD)<br>Accreditation Scheme administered by<br>the Fire Protection Association<br>Australia (FPAA) |
| <b>Prepared by:</b>                                                                          | Jeff Dau – BPAD 33128 - Level 3                                                                                                    |
| <b>Verified by:</b>                                                                          | Rob McGregor – BPAD 33130 – Level 2                                                                                                |

- A thorough, in person, survey of the study area was carried out on 4<sup>th</sup> October 2022;
- A subsequent bushfire threat assessment was undertaken of the site and the proposal per the relevant sections of the NSW Rural Fire Service (NSW RFS) document Planning for Bushfire Protection 2019 (PBP 2019);
- A detailed bush fire assessment report is attached per the submission requirements of Section 4 of PBP, together with recommendations needed for future development to satisfy the specifications and requirements of PBP;
- That I am a person recognised by NSW RFS as a qualified consultant in bush fire risk assessment; and
- That subject to the recommendations contained in this report, the proposed development conforms to the relevant specifications and requirements of PBP.

Furthermore, I am aware that this report is to be submitted in support of a development application for this site and will be relied upon by Council as the basis for ensuring that the bushfire risk management aspects of the proposal have been addressed per PBP.



12/7/2023



The author (Jeffrey Dau) hereby certifies that:

*DOCUMENT CONTROL*

| Information             | Detail                                                                                          |
|-------------------------|-------------------------------------------------------------------------------------------------|
| <b>Document Title:</b>  | Bushfire Assessment Report<br>Planning Proposal, Googong                                        |
| <b>EMBER Reference:</b> | JD.168.23                                                                                       |
| <b>Other Reference:</b> |                                                                                                 |
| <b>Version:</b>         | 1.0                                                                                             |
| <b>Version Control:</b> | 1.0 – First Issue – 8.12.22<br>2.0 -Final Issue – 12.7.23 (updated reference to<br>QPRLEP 2022) |
| <b>Status:</b>          | Issued                                                                                          |

*KEY DETAILS OF DEVELOPMENT*

| Information                       | Detail                                                                                                                                              |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Zoning of subject land</b>     | R1 – General Residential<br>C2 – Environmental Conservation<br>R5 – Large Lot Residential                                                           |
| <b>Zoning of adjoining lands</b>  | R1 – General Residential<br>C2 – Environmental Conservation<br>C3 – Environmental Living<br>R5 – Large Lot Residential<br>SP2 – Water Supply System |
| <b>Lot size</b>                   | Consistent with General Residential Zoning                                                                                                          |
| <b>Staging issues</b>             | Nil                                                                                                                                                 |
| <b>Development classification</b> | Planning Proposal                                                                                                                                   |
| <b>Type of assessment</b>         | Bush Fire Strategic Study                                                                                                                           |
| <b>Fire weather area</b>          | Southern Ranges                                                                                                                                     |
| <b>Fire Danger Index</b>          | 100                                                                                                                                                 |
| <b>Predominant vegetation</b>     | Woodland and Forest Vegetation                                                                                                                      |
| <b>Slope</b>                      | Ranging from flat to 5°-10° downslope                                                                                                               |

|                                                   |                                          |
|---------------------------------------------------|------------------------------------------|
| <b>Environmental constraints</b>                  | Typical Biodiversity Offset Scheme (BOS) |
| <b>Cultural constraints</b>                       | Nil known                                |
| <b>Method of meeting performance requirements</b> | Using acceptable solutions.              |

*HOW TO READ THIS DOCUMENT*

Section 1 – Introduction and overview of the subject site and proposed development.

Section 2 – Identification of key factors contributing to bushfire threat, including planning considerations and assessment of overall risk.

Section 3 – Discussion of strategic bush fire considerations.

Section 4 – Assessment of the recommended and required bushfire protection measures necessary for life safety and compliance purposes.

Section 5 – Summary of recommendations.

Section 6 – Conclusion

## TABLE OF CONTENTS

|          |                                         |                              |
|----------|-----------------------------------------|------------------------------|
| <b>1</b> | <b>INTRODUCTION AND OVERVIEW</b>        | <b>6</b>                     |
| 1.1      | BACKGROUND                              | 6                            |
| 1.2      | AIM AND OBJECTIVES                      | 7                            |
| 1.3      | LIMITATIONS AND DISCLAIMER              | 7                            |
| 1.4      | STUDY AREA LOCATION                     | 9                            |
| 1.5      | STUDY AREA ZONING                       | 16                           |
| 1.6      | STUDY AREA DESCRIPTION                  | 10                           |
| 1.7      | THE DEVELOPMENT PROPOSAL                | 10                           |
| 1.8      | STUDY AREA – CONCEPT SUBDIVISION LAYOUT | 12                           |
| <b>2</b> | <b>BUSHFIRE THREAT ASSESSMENT</b>       | <b>13</b>                    |
| 2.1      | METHODOLOGY                             | 13                           |
| 2.2      | DESIGN FIRE ATTRIBUTES                  | 13                           |
| 2.3      | BUSHFIRE PRONE MAPPING                  | 14                           |
| 2.4      | FIRE HISTORY                            | 15                           |
| 2.5      | VEGETATION FORMATIONS AND PHOTO POINTS  | ERROR! BOOKMARK NOT DEFINED. |
| 2.6      | EXAMPLES OF HAZARD TYPES                | 18                           |
| 2.7      | SLOPE ASSESSMENT                        | 23                           |
| 2.8      | PHOTOGRAPHIC OVERVIEW OF STUDY AREA     | ERROR! BOOKMARK NOT DEFINED. |

|                                            |                                                           |
|--------------------------------------------|-----------------------------------------------------------|
| PHOTOGRAPHIC OVERVIEW OF STUDY AREA        | ERROR! BOOKMARK NOT DEFINED.                              |
| PHOTOGRAPHIC OVERVIEW OF STUDY AREA        | ERROR! BOOKMARK NOT DEFINED.                              |
| AERIAL PHOTOGRAPHIC OVERVIEW OF STUDY AREA | ERROR! BOOKMARK NOT DEFINED.                              |
| 2.9                                        | STUDY AREA ACCESS24                                       |
| 2.10                                       | EMERGENCY SERVICES26                                      |
| 3                                          | STRATEGIC BUSHFIRE CONSIDERATIONS27                       |
| 3.1                                        | BUSH FIRE LANDSCAPE ASSESSMENT27                          |
| 3.2                                        | LAND USE ASSESSMENT28                                     |
| 3.3                                        | ACCESS AND EGRESS28                                       |
| 3.4                                        | EMERGENCY SERVICES28                                      |
| 3.5                                        | INFRASTRUCTURE29                                          |
| 3.6                                        | ADJOINING LAND29                                          |
| 3.7                                        | STRATEGIC BUSHFIRE CONSIDERATIONS CONCLUDING STATEMENT.30 |
| 4                                          | BUSHFIRE PROTECTION AND PREVENTION MEASURES31             |
| 4.1                                        | ASSET PROTECTION ZONES (APZs) & SETBACKS31                |
| 4.2                                        | LANDSCAPING32                                             |
| 4.3                                        | ACCESS33                                                  |
| 4.4                                        | PERIMETER ROADS.ERROR! BOOKMARK NOT DEFINED.              |
| 4.5                                        | SERVICES – WATER, ELECTRICITY AND GAS:33                  |
| 5                                          | CONCLUSION34                                              |

**6 REFERENCE 35**

# 1 INTRODUCTION AND OVERVIEW

## 1.1 BACKGROUND

EMBER Bushfire Consulting has been engaged by Googong Township Pty Ltd (GTPL) to prepare a bush fire assessment report (BFAR) in support of a planning proposal. The proposal seeks minor amendments to the *Queanbeyan-Palerang Regional Local Environmental Plan 2022* (QPRLEP 2022) as it applies to certain land in Googong (the study area) within the Queanbeyan-Palerang Local Government Area (LGA).

If successful, the planning proposal will result in a moderate expansion of residential areas to the south and east of Neighbourhoods 1B and 3-5, which is the subject of this bush fire assessment.

The planning proposal is located on land designated bushfire prone by NSW Rural Fire Service (NSW RFS) and Council and, as a result, requires the application of Section 9.1(2) of the Environmental Planning and Assessment Act (1979) (EP&A Act). Under Direction 4.4 of the EP&A Act, Planning for Bush Fire Protection applies to planning proposals on designated Bush Fire Prone Land (BFPL).

Under Direction 4.4, planning proposals should adhere to the following objectives:

- to protect life, property, and the environment from bushfire hazards by discouraging the establishment of incompatible land uses in bushfire prone areas; and
- to encourage sound management of bushfire prone areas.

The principles for assessment of the planning proposal are provided in Section 4 Strategic Planning, Planning for Bush Fire Protection (2019) (PBP 2019) and is therefore the key reference for this report.

The broad principles of Section 4 are to:

- ensure land is suitable for development in the context of bush fire risk;
- ensure new development on BFPL will comply with PBP;
- minimise reliance on performance-based solutions;
- provide adequate infrastructure associated with emergency evacuation and firefighting operations; and
- facilitate appropriate ongoing land management practices.

Accordingly, this BFSS addresses the issues identified in Table 4.2.1 Bush Fire Strategic Study of PBP 2019.

Should the planning proposal be successful future development of land will be required to satisfy the aims and objectives of PBP 2019 and therefore, is also addressed in this report.

This assessment has been prepared through a desktop study of the study area, as well as an in-person area survey completed on 6.7.22 by Peter Hague from EMBER Bushfire Consulting and peer reviewed by Level 3 Accredited Bushfire Practitioner Jeff Dau.

## 1.2 AIM AND OBJECTIVES

The aim of this report is to:

- Evaluate the potential bushfire threat to the Study Area.
- Assess the capacity of the proposed concept subdivision development to adequately support the subdivision of land and the erection of dwellings while providing:
  - the minimum bushfire protection necessary to offer life safety to the occupants;
  - improve property protection and facilitate fire service intervention during a bushfire event; and
  - due regard to development potential, site characteristics and protection of the environment.

- Provide initial principles for how any future subdivision and development of land may satisfy the relevant performance criteria for rural residential subdivisions provided in Section 5 PBP 2019.

## 1.3 LIMITATIONS AND DISCLAIMER

This report is primarily concerned with assessing the capacity of the proposal to withstand the impacts of a bushfire, including ember attack, radiant heat exposure and flame contact.

Where necessary protection measures will be recommended to provide a level of protection to the occupants, fire fighters and the structures themselves.

It should be kept in mind that the measures recommended cannot guarantee the proposed development will survive a bushfire event on every occasion.

This is primarily due to the dependence on ongoing vegetation management, the unpredictable behaviour of fire, and extreme weather conditions.

EMBER Bushfire Consulting has prepared this report with all reasonable diligence. The information contained in this report has been gathered from field investigations of the site as well as plans provided by CBR Consulting, representatives of the property owner.

Table 1 - Stakeholders

| Stakeholder                          | Role               | Contact     | Detail        |
|--------------------------------------|--------------------|-------------|---------------|
| Googong Township Pty Ltd             | Property Owner     | Tim Corby   | 0488 242 846  |
| Eight Mile Planning                  | Town Planner       | Liz Densley | 0438 744 384  |
| Queanbeyan-Palerang Regional Council | Consent Authority  | Not Given   | 1 300 735 025 |
| NSW Rural Fire Service               | Referral Authority | Not Given   | 02 4475 1300  |

1.4 STUDY AREA LOCATION

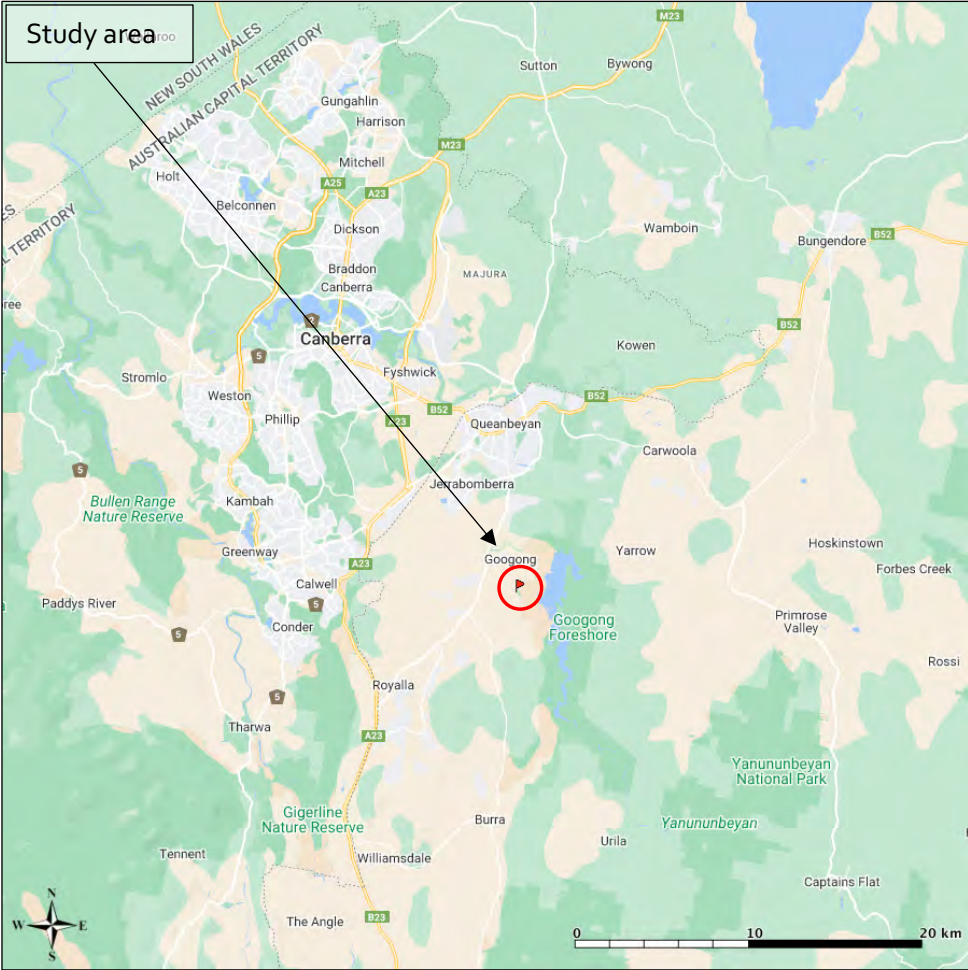


Figure 1 – Regional context of the study area (FPAA FireMaps, 2022)

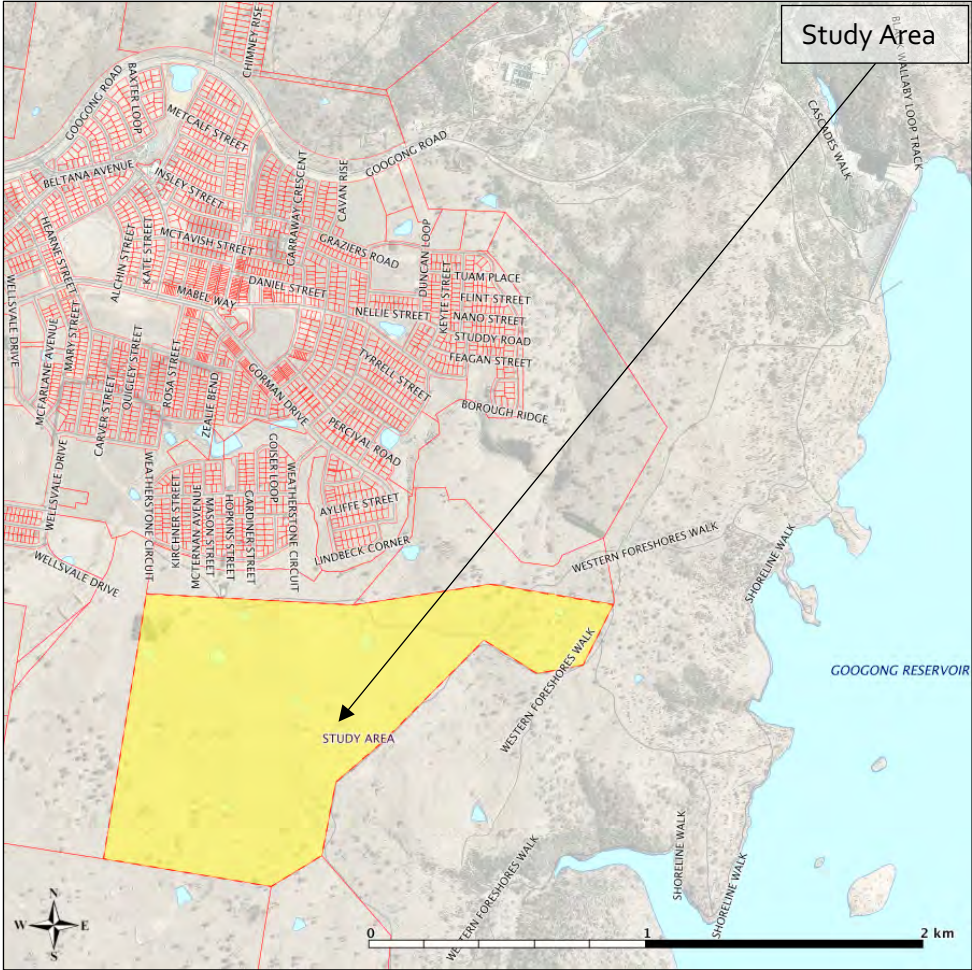


Figure 2 – Local context of the study area (FPAA FireMaps, 2022)

## 1.5 STUDY AREA DESCRIPTION

### **Location:**

The study area is an undeveloped rural lot located within the greater Googong Township area, outside of Queanbeyan in southeast New South Wales. It is located approximately 9 km due south of Queanbeyan central business district and 20 km southeast of Canberra City (Figure 1 & 2).

### **Administration:**

The ~107 Ha rural lot falls under the administration of the Queanbeyan-Palerang Regional Council (QPRC).

### **Land use:**

Land use to the North is dominated by new urban development associated with Googong Township while areas to the South and Southwest are small-scale agricultural enterprises and large rural lifestyle properties. To the east the study area abuts the protected area of Googong Foreshore which holds with it conservation values.

Accordingly, the study area is zoned C2 – Environmental Conservation, R5 – Large Lot Residential and R1- General Residential.

### **Topography:**

Terrain across the Googong development area is undulating, although further afield are some steep gullies associated with drainage lines into

Googong reservoir. Relief across the study area runs generally between 0° to 7° degrees downslope towards natural water courses.

### **Vegetation:**

While vegetation across the site presents as open grassland, with scattered paddock trees and small pockets of remnant woodland, a highly conservative approach has been taken for hazard analysis where the vegetation classification is aligned with Plant Community Type (PCT) Vegetation Zones identified in the biodiversity study (Figures 7 & 8).

### **Access:**

Access to and from the study area will have multiple access points to Old Cooma Road via Googong Neighbourhoods 3, 4 and 5 to the West and via Googong Neighbourhoods 1 and 2 to the North.

Any future proposal will be designed with an interconnected road network including perimeter roads and multiple connection points with Googong Neighbourhoods 1 to 5 enabling through road access for the estate.

Emergency Access will also be provided into the Googong dam foreshore reserve, managed by the ACT Government, to allow for maintenance and firefighting activities.

## **1.6 THE PLANNING PROPOSAL**

The Planning Proposal seeks minor amendments to the QPRLEP 2022 as it applies to the study area.

The proposed amendments to the QPRLEP 2022 aim to rationalise the development boundary in response to the Biodiversity Certification of land that is currently zoned for urban uses to ensure that planning controls are aligned with the conservation objectives of Googong.

Certain areas of residentially zoned land will be zoned conservation and a small area of land within the Googong Foreshore Interface Management Strategy (GFIMS) area to the south and east of Neighbourhood 1B and Neighbourhoods 3-5 of the study area is proposed to be rezoned for residential uses.

The proposed changes will facilitate the delivery of development yield identified for the study area in the Googong Masterplan.

In anticipation of a successful planning proposal, a concept subdivision plan for an extension to Googong Neighbourhood 4 & 5 has been developed (Figure 3) and is the basis for the purposes of the compliance assessment to determine the suitability of the planning proposal.

The planning and design of this extension embraces all the acceptable solutions contained within Section 5 Residential Subdivisions PBP2019.

1.7 STUDY AREA AND CONCEPT SUBDIVISION LAYOUT

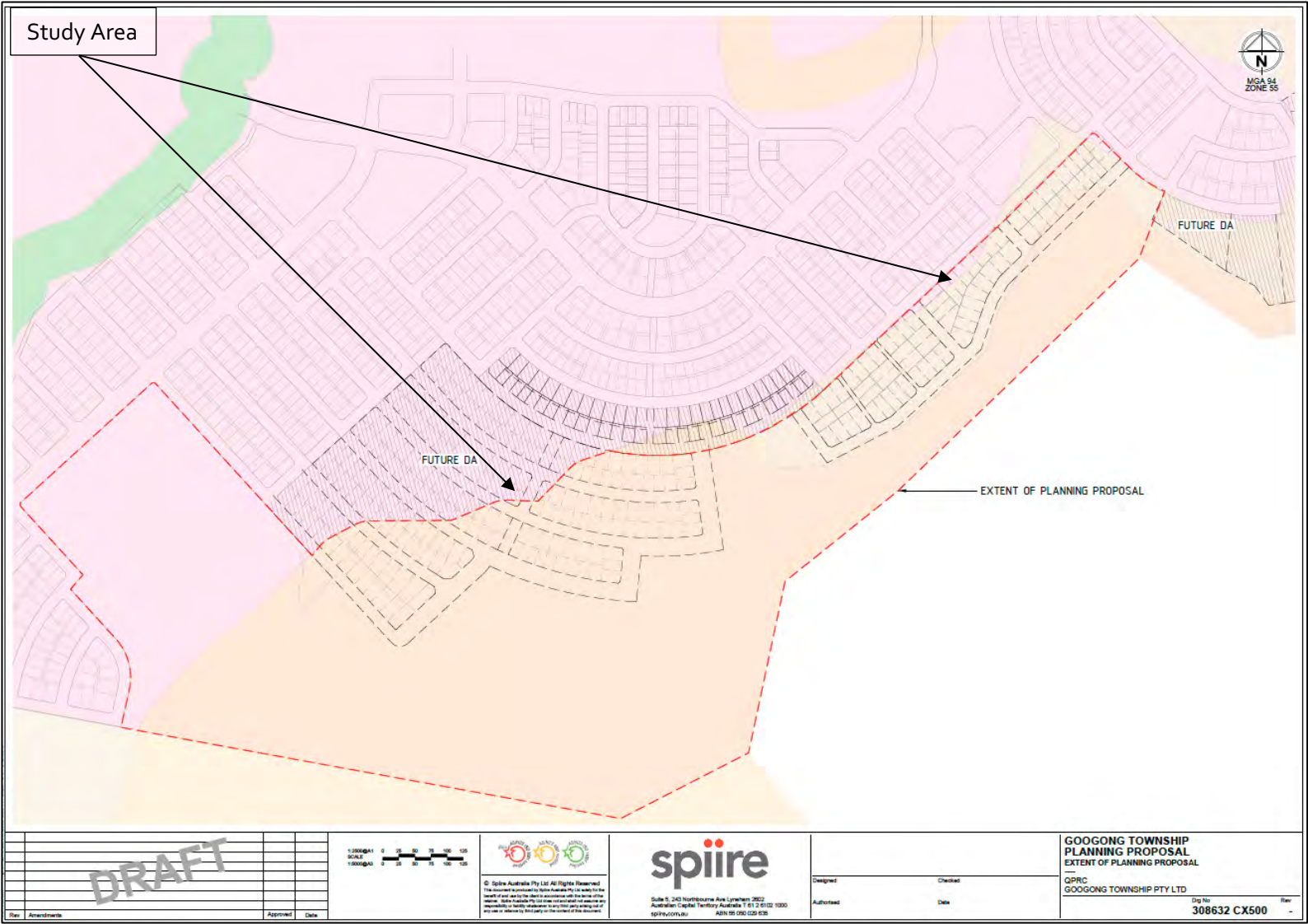


Figure 3 – Extent of planning proposal and concept subdivision plan (Spiire, 2022)

## 2 BUSHFIRE THREAT ASSESSMENT

### 2.1 METHODOLOGY

The methodology adopted by this report is as follows:

Table 2 - Report methodology

| Method                                                                                              | Task                                                                                                                      | Considerations                                                                                                                        |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>Desktop analysis</b>                                                                             | Review available mapping resources, policy documents & development plans                                                  | Online Maps<br>Development Control Plans<br>Local Environmental Plan                                                                  |
| <b>Site inspection</b>                                                                              | Evaluate context of site, determine bushfire threat, options for asset protection zones, access roads and infrastructure. | Ground truth online mapping data, validate vegetation class, obtain site measurements, assess existing structures and infrastructure. |
| <b>Assessment of proposal against the requirements of the SEARs, Scoping document and PBP 2019.</b> | Assess the development proposal against the objectives of PBP 2019.                                                       | Does the proposal comply with the performance criteria provided under of PBP 2019?                                                    |
| <b>Report</b>                                                                                       | Preparation and publication of bushfire assessment report                                                                 | Assess bushfire threat and detail the required and recommended protection measures expected of the proposal.                          |

### 2.2 DESIGN FIRE ATTRIBUTES

To determine the potential bushfire threat posed to the subject site, the following environmental factors are adopted across the site.

Table 3 - Design fire attributes

| Factor                                       | Value                              |
|----------------------------------------------|------------------------------------|
| <b>Fire Weather Area</b>                     | Southern Ranges                    |
| <b>FDI</b>                                   | 100                                |
| <b>Predominant Vegetation Classification</b> | Grassy Woodlands, and Forest       |
| <b>Slope</b>                                 | Ranging from flat to 7° downslope. |

*Note: A detailed bushfire hazard analysis is detailed below.*

- *Vegetation formations within 140 m of the subject site are classified in accordance with Plant Community Type (PCT) mapping (Figs 5-8).*
- *Slopes out to 100 m from planned APZs and / or lot boundaries have been assessed in accordance with A1.4 & A1.5 of PBP 2019.*
- *The fire danger index for the site has been determined in accordance with the NSW Rural Fire Service.*
- *A bushfire threat analysis is provided in Section 3 of this report.*

2.3 BUSHFIRE PRONE MAPPING

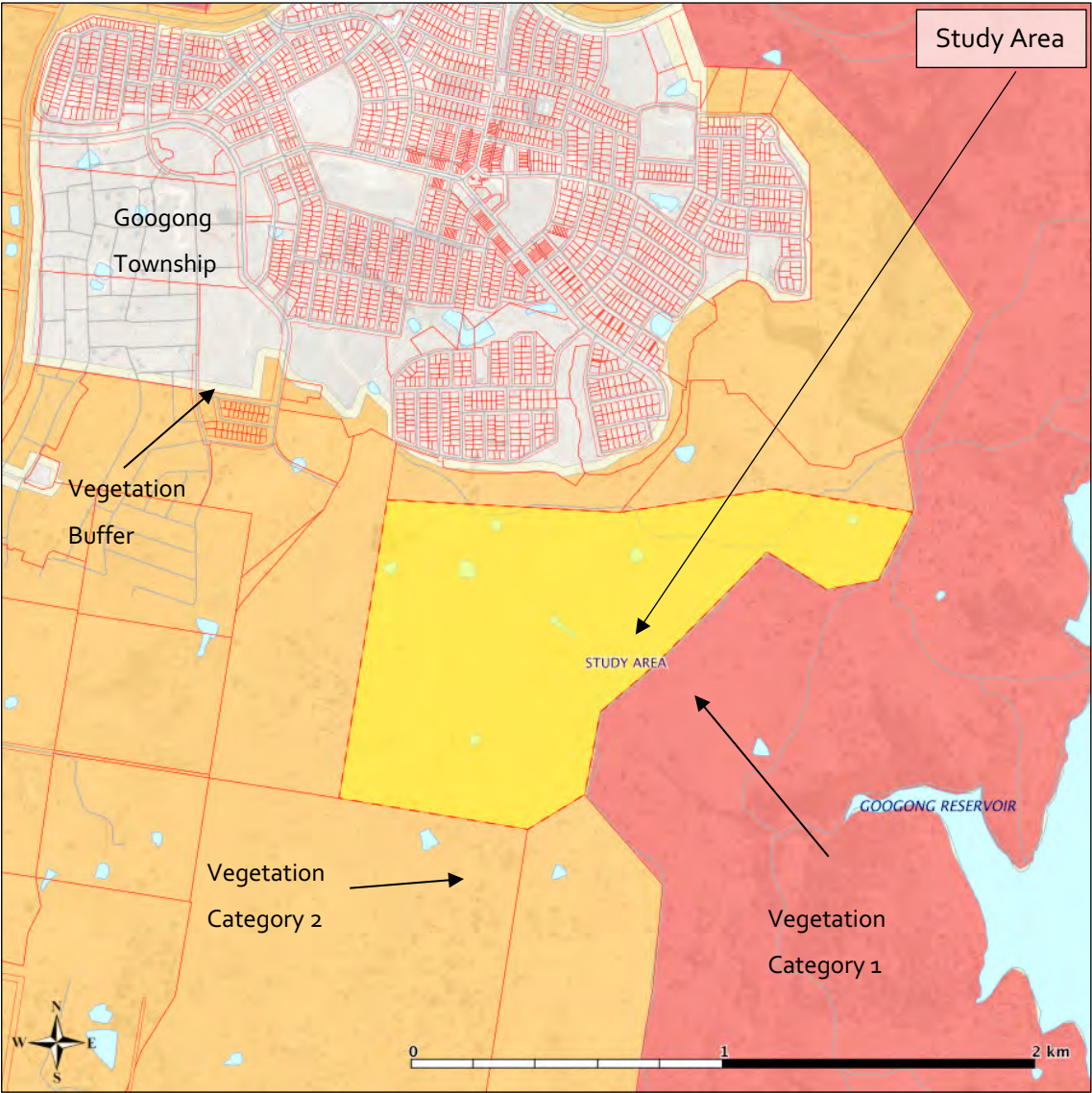


Figure 4 – Study Area bushfire prone land map. (FPAA FireMaps, 2022)

## 2.4 FIRE HISTORY

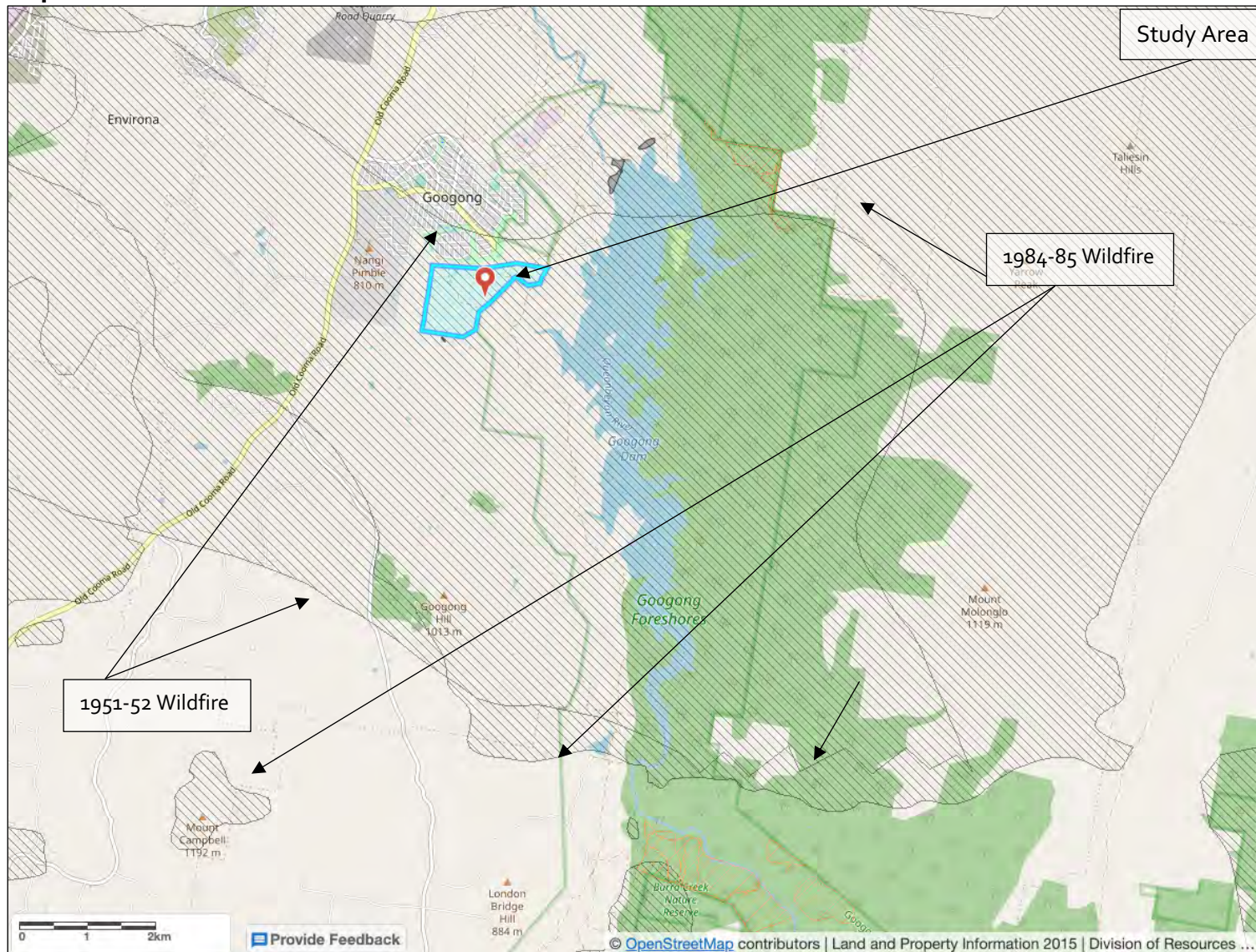
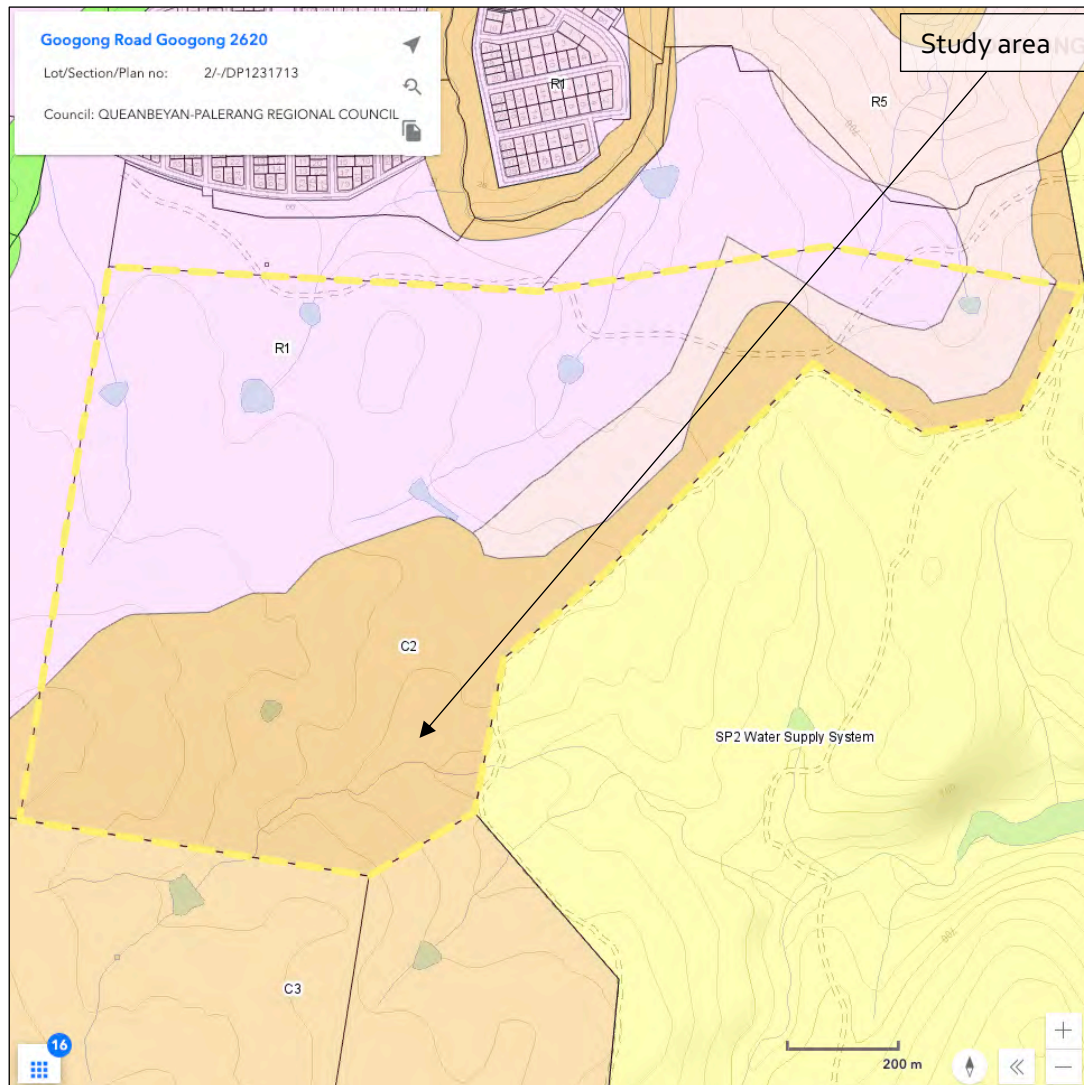


**Figure 5 – Map showing fire history surrounding Googong and approx. extent of the 1951-52 and 1984-85 Wildfires. (SEED, 2022)**

## 2.5 STUDY AREA ZONING



Subject site zoning as defined by (NSW Government, 2022) NSW Planning Portal – ePlanning Spatial Viewer.

An assessment of land use zoning aids in the evaluation of broadscale landscape practices and the ability to manage vegetation within and surrounding the subject site.

The land zoning map indicates that the subject site is zoned as – C2 – Environmental Conservation, R5 – Large Lot Residential and R1- General Residential.

The surrounding lots are zoned as C2 – Environmental Conservation, C3 – Environmental Living, R5 – Large Lot Residential and SP2 – Water Supply System.

C2 and C3 zoning indicates that land use practices and strategic landscape management will not allow for intensive management of vegetation (fuels) and therefore any proposed development would be required to address any adjacent persistent hazard.

Figure 6 – Showing zoning of the study area and adjoining lots. (NSW Planning Portal, 2022)

## 2.6 STUDY AREA BUSHFIRE PRONE MAPPING

Bushfire prone land mapping relative to the study area (Figure 4) showing adjacent land containing areas of Category 1 Vegetation and the study area containing areas of Category 3 Vegetation and identified as bush fire prone land by Council and NSW RFS.

During the site survey conducted on 4<sup>th</sup> October, these vegetation categories were verified, and the bushfire prone map found to be an accurate representation of the identified hazard.

## 2.7 STUDY AREA FIRE HISTORY

While the bushfire prone mapping clearly identifies that any development on the Study area will require a bush fire assessment and compliance with PBP 2019, fire history provides a clear picture of the true vulnerability of the site.

Figure 5 shows the fire history and extent of bushfires impacting the area surrounding the study area. The last major bushfire to impact the area was a wildfire during the 1984-85 bushfire season.

While land-use, population and the landscape has changed since that time the site is still considered vulnerable including from a fire event originating from the heavily vegetated areas of the Googong Foreshore Reserve to the east.

## 2.8 STUDY AREA VEGETATION FORMATIONS AND PHOTO POINTS

While vegetation across the site presents as open grassland, with scattered paddock trees and small pockets of remnant woodland, at the request of the developer a highly conservative approach has been taken for hazard analysis where the vegetation classification is aligned with Plant Community Type (PCT) Vegetation Zones identified in the biodiversity study (Figure 7). This considers potential future vegetation state.

Vegetation formations adopted for the bushfire analysis are shown in Figure 8

Vegetation mapping indicates that the study area is dominantly influenced by the following vegetation formations –

- Grassy Woodland (moderate level threat)
- Forest (high level threat)

Examples of the existing vegetation formations are provided below in Photos 1 to 8.

2.9 PCT AND VEGETATION ZONES

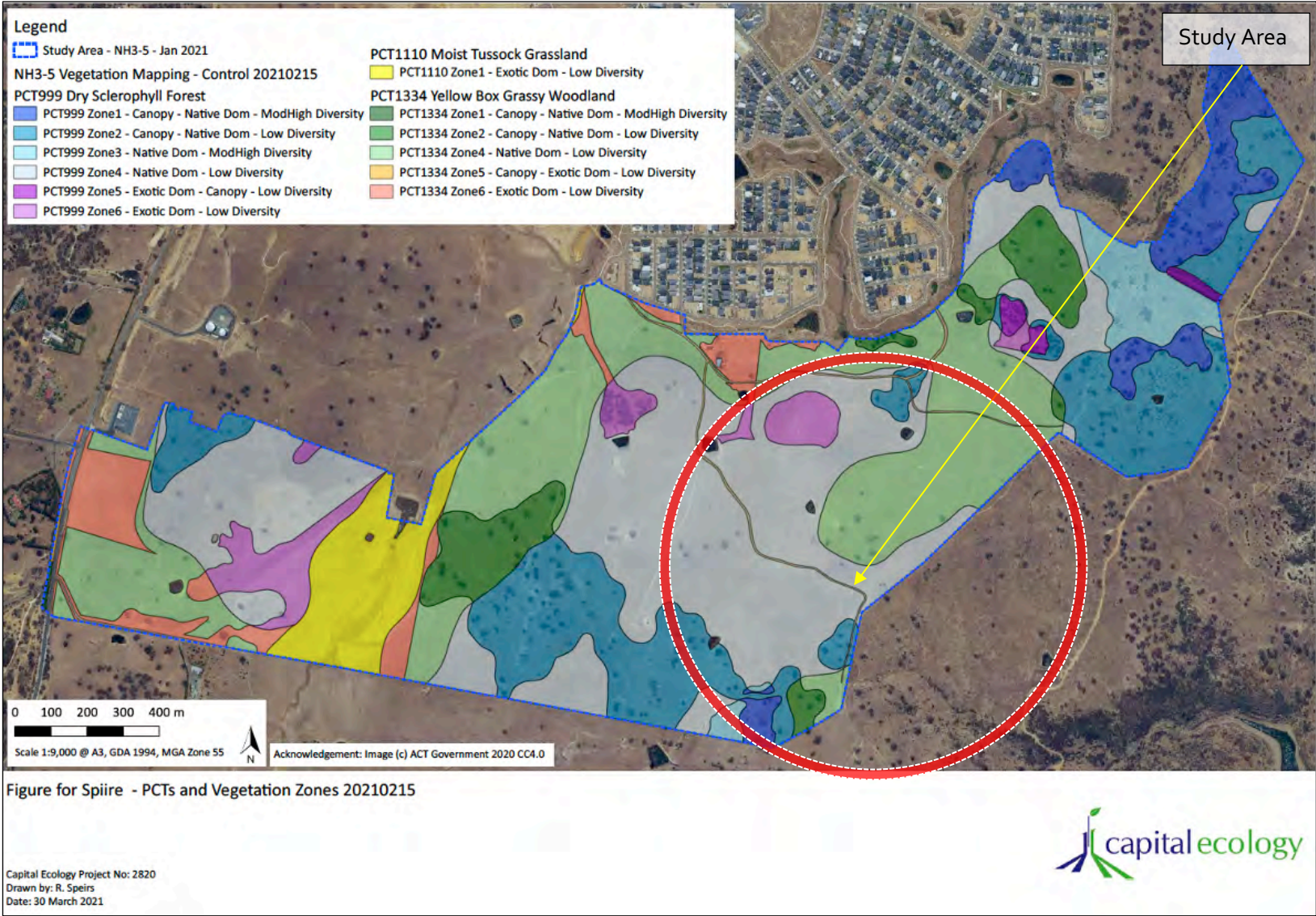


Figure 7 – PCTs and Vegetation Zones. (Capital Ecology, 2022)

2.10 VEGETATION FORMATIONS

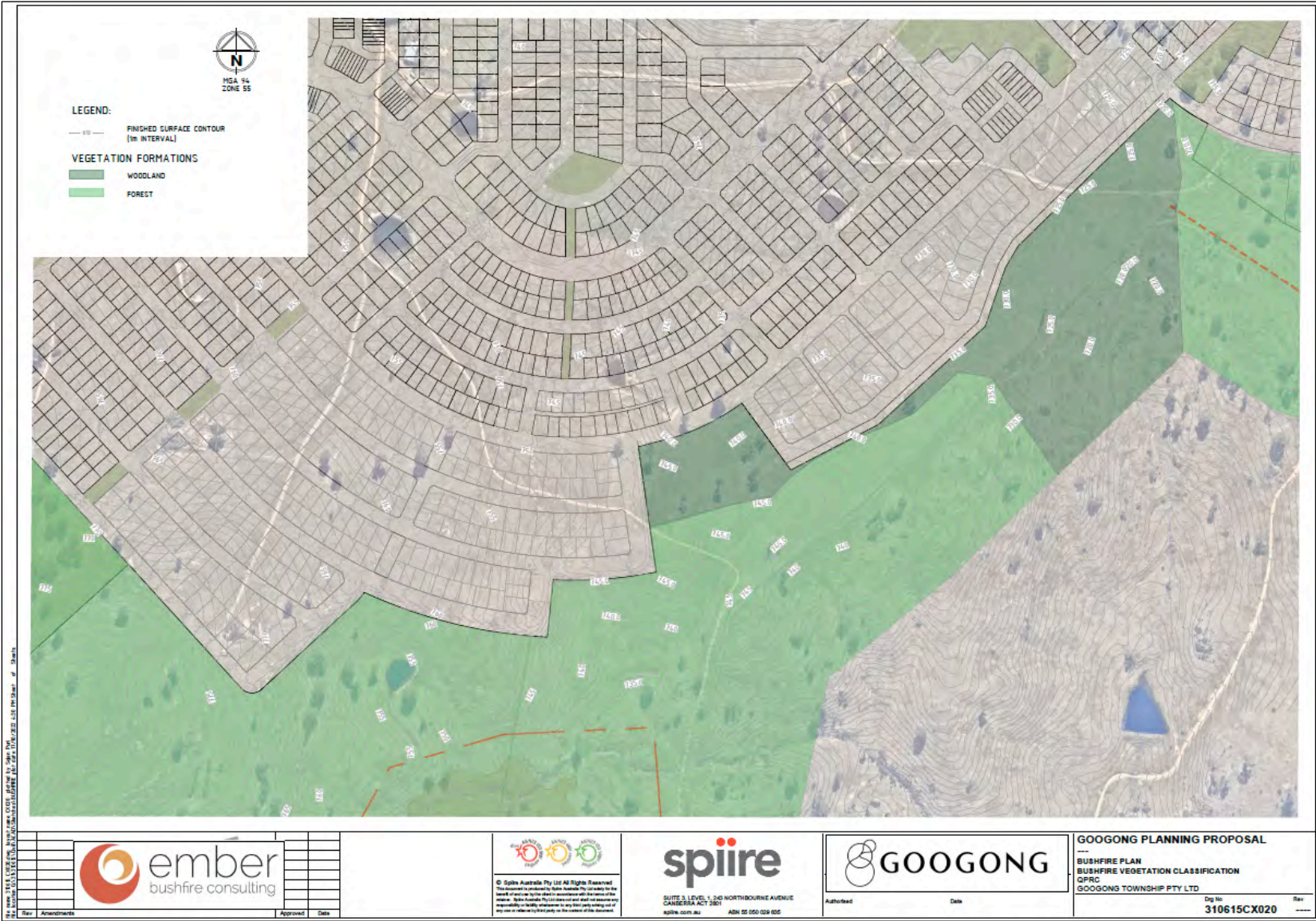


Figure 8 – Vegetation formations adopted as basis for assessment of concept subdivision. (Spiire, 2022)

2.11 PHOTO POINTS

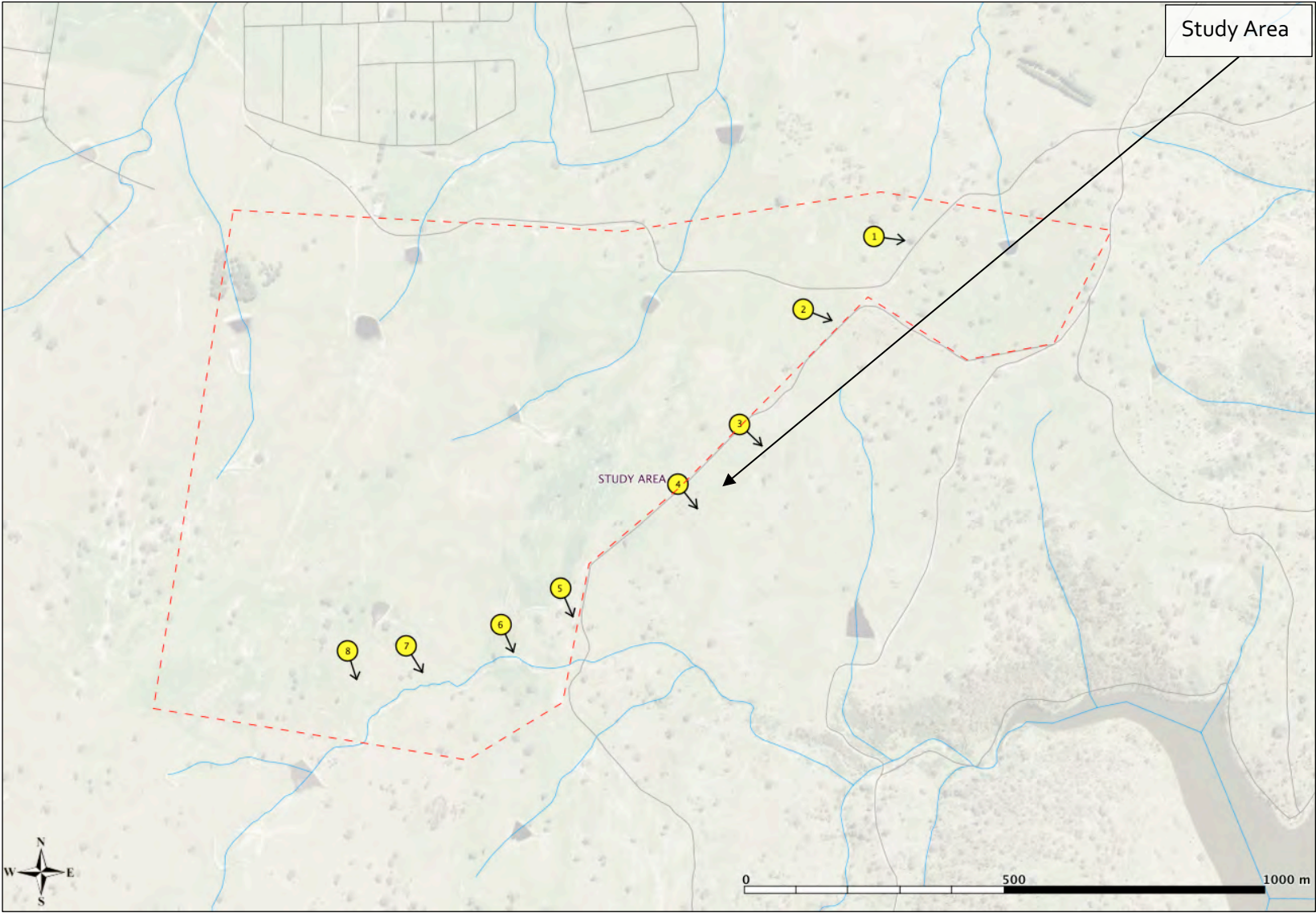


Figure 9 – Photo point locations. (SEED, 2022)

2.12 PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Figure 10. Photo Point 1. Showing hazard vegetation east of the study area.



Figure 12 Photo point 3. Showing hazard vegetation southeast of the study area.



Figure 11 Photo point 2. Showing hazard vegetation east of the study area.



Figure 13 Photo point 4. Showing hazard vegetation southeast of the study area.

PHOTOGRAPHIC OVERVIEW OF SITE VEGETATION



Figure 14. Photo Point 5. Showing hazard vegetation south of the study area.



Figure 16 Photo Point 7. Showing hazard vegetation south of the study area.



Figure 15 Photo point 6. Showing hazard vegetation south of the study area.



Figure 17 Photo point 8. Showing hazard vegetation south of the study area.

2.13 SLOPE ASSESSMENT

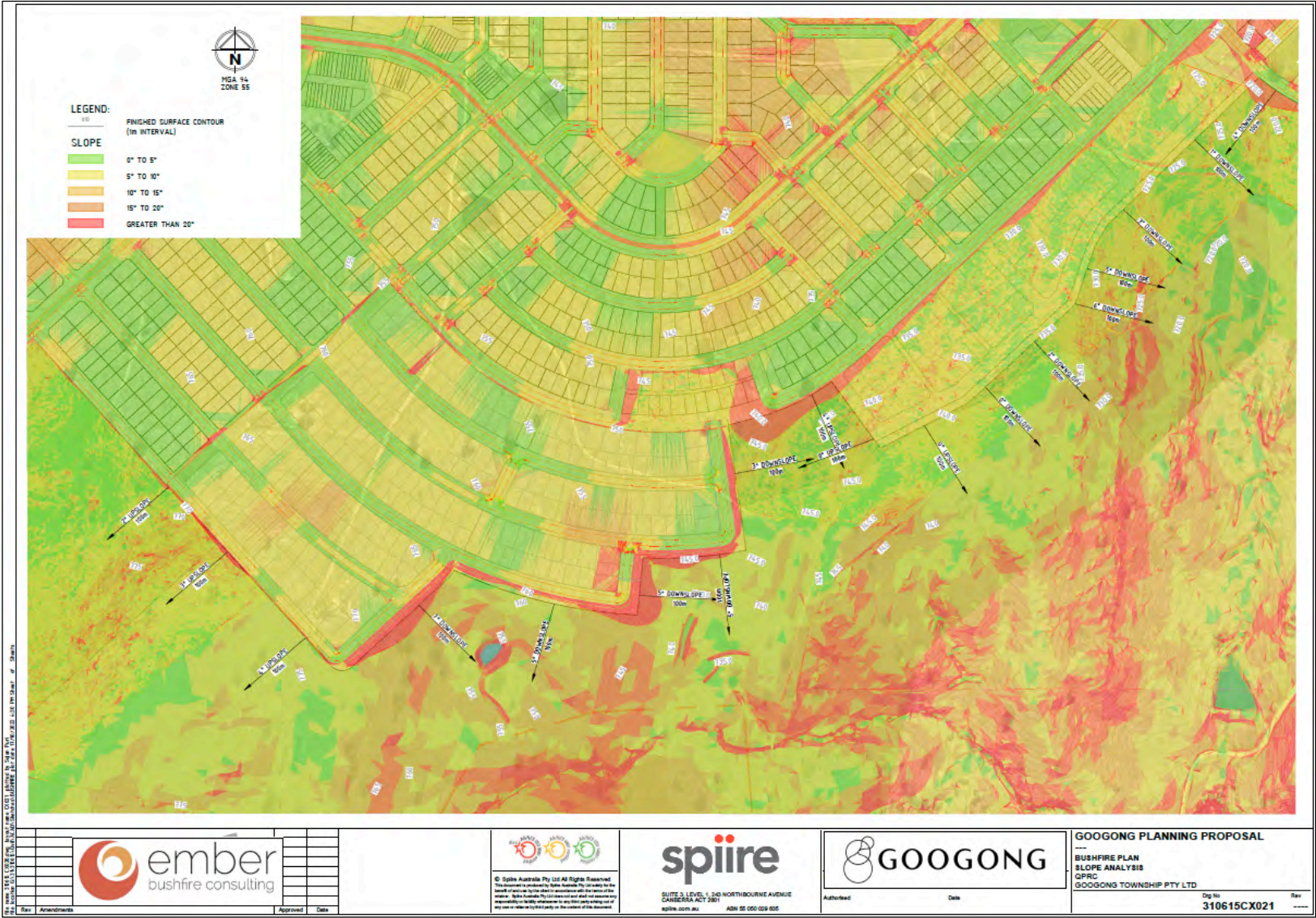


Figure 18 – Broad-scale slope assessment of concept subdivision. (Spiire, 2022)

2.14 APZ ANALYSIS

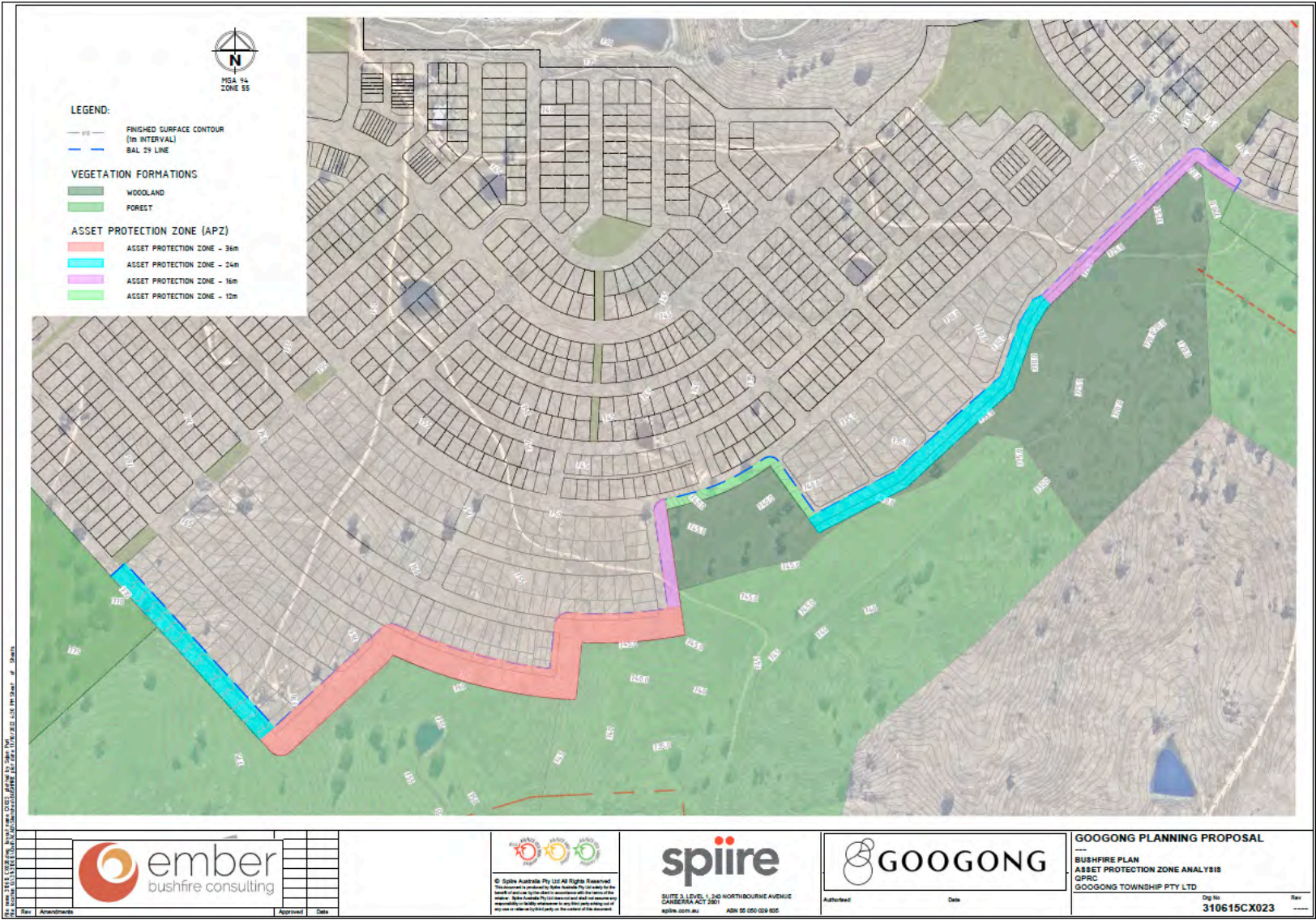


Figure 19 – APZ analysis of concept subdivision with the APZ dimensions necessary for compliance with Table A1.12.2 PBP 2019. (Spiire, 2022)

## 2.15 BAL ANALYSIS

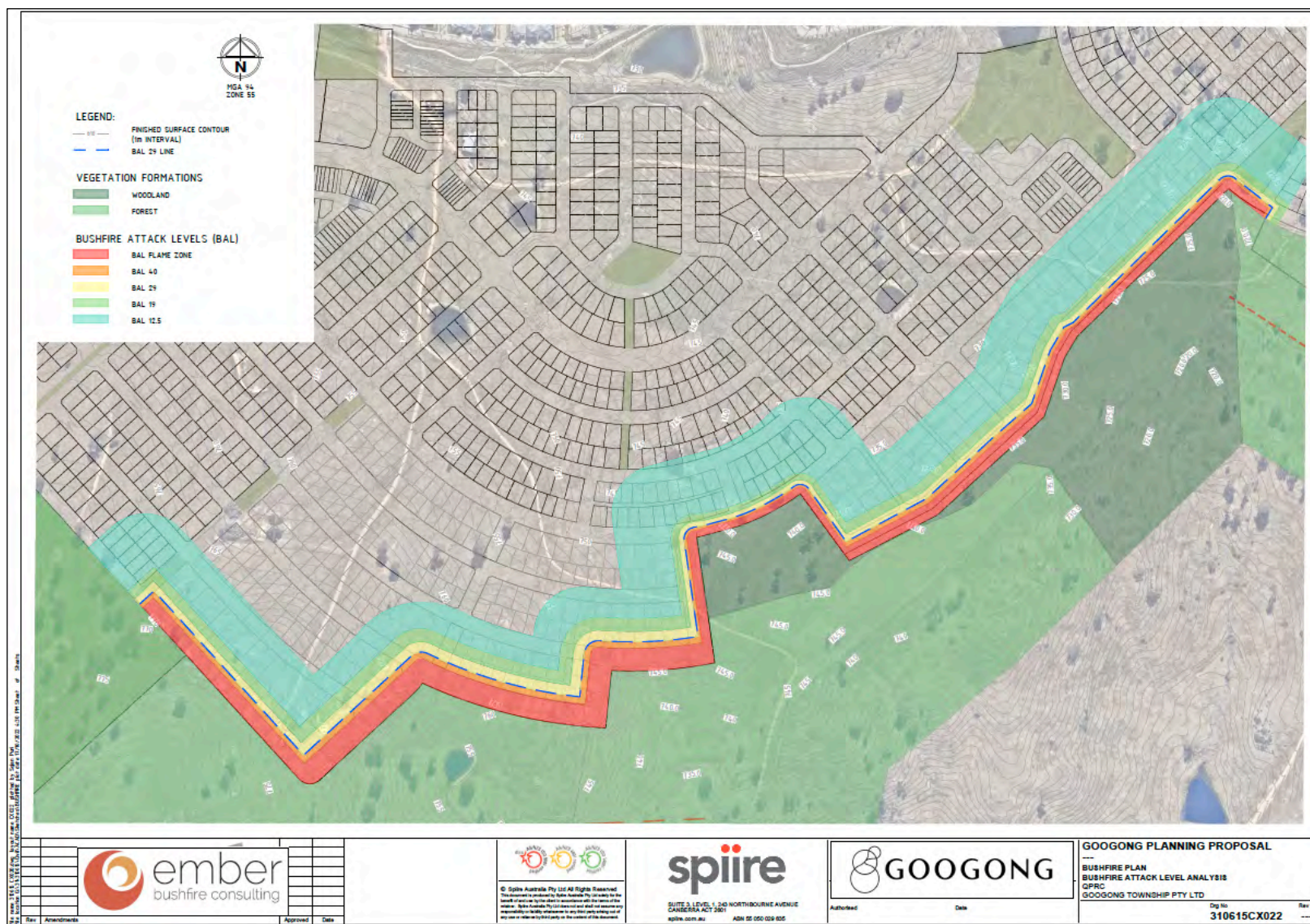


Figure 20 – BAL analysis demonstrating that the concept subdivision is capable of broad compliance with A1.12.2 PBP 2019. (Spiire, 2022)

## 2.16 EMERGENCY SERVICES

The study area is amply serviced by both NSW Rural Fire Service and Fire & Rescue NSW.

The closest responding NSW RFS brigades and stations and resources available are:

**Fernleigh Park** (Swan Drive) (5 km / 6 min from the study area)

- 1 x Category 7 tanker

**Jerrabomberra Creek** (Old Cooma Road) (10 km / 9 min from the study area)

- 1 x Category 11 tanker
- 1 x Category 1 tanker
- 1 x Category 9 tanker

**Queanbeyan City** (Ellerton Drive) (11 km / 11 min from the study area)

- 2 x Category 7 tankers
- 1 x Category 1 tanker
- 1 x Category 9 tanker

Fire & Rescue NSW Station within 15 min from the study area include Queanbeyan Fire Station.

It should also be noted that ACT RFS, Parks and Conservation and ACT Fire & Rescue all have resources within proximity and capable of responding to the study area as well.

### 3 STRATEGIC BUSHFIRE CONSIDERATIONS

#### 3.1 BUSH FIRE LANDSCAPE ASSESSMENT

##### *Vegetation –*

Its prevalent from the site photos (Figures 10 to 17) that the study area is currently influenced by cleared land for the purpose of livestock grazing with small, scattered paddock trees throughout and a small area of remnant vegetation (narrow or small clusters of vegetation) to the east of the study area.

At the request of the developer however a highly conservative approach has been taken for hazard analysis where the vegetation classification is aligned with Plant Community Type (PCT) Vegetation Zones identified in the biodiversity study (Figure 7).

This assessment considers potential future vegetation state and while the vegetation formation types of Forest and Woodland have been adopted for the purposes of APZ dimensions it is unlikely that these formations would reach their climax fuel loads, resulting in a significant factor of safety for the concept subdivision.

##### *Topography –*

The topography within the study area is predominantly flat with a mild south and eastern slope across the study area to the order of 0° – 7° downslope

towards Googong Dam which forms the study areas eastern boundary (Figure 18).

With an understanding that steeper slopes increases fire threat potential, the mild topography of the study area provides a relatively low to moderate threat environment for the proposed future concept residential subdivision development and an excellent opportunity to provide a range of Bushfire Protection Measures (BPMs) that will satisfy the acceptable solutions of PBP 2019.

##### *Weather -*

For planning and assessment purposes the Study Area attracts and Fire Danger Index (FDI) of 100 as assigned to the Queanbeyan-Palerang Weather District.

With that established however, as was seen during the recent Black Summer Fires in 2019-20, the area can experience elevated fire conditions in any given Summer and these conditions are not unusual in assessing fire potential over the normal.

**Fire History -**

The study area does demonstrate some history of fire, although it is in frequent and usually broad in scale.

While land-use, population and the landscape has changed since the time of the last fire the site is still considered vulnerable including from a fire event originating from the heavily vegetated areas of the Googong Foreshore Reserve to the east.

In the right context and environment however, PBP 2019 provides the necessary protection measures to mitigate bushfire risk and support development in bushfire prone environments with moderate threat much like the Study Area.

**3.2 LAND USE ASSESSMENT**

Apart from established residential living mainly to the north of the Study Area, the predominant land use in this area is grazing of livestock, primary production and other small-scale agricultural enterprises that surround the local community and the Googong township.

To the east the study area is the Googong Foreshore which holds with it high conservation values. Future development of this land is unlikely and with landscape and vegetation management practices at a minimum, the threat from this direction will be persistent for the life of the development.

The conservative values adopted for the vegetation formations in the threat assessment will more than adequately take this persistent bushfire threat into account.

**3.3 ACCESS AND EGRESS**

Future access to the concept subdivision from Old Cooma Road will be via Googong Neighbourhoods 3, 4 and 5 to the West and via Googong Neighbourhoods 1 and 2 to the North.

Any future proposal will be designed with an interconnected road network including perimeter roads and multiple connection points with Googong Neighbourhoods 1 to 5 enabling through road access for the estate. Like all roads throughout Googong Township, at a minimum they will comply with the acceptable solutions for access in PBP 2019.

Emergency Access will also be provided into the Googong dam foreshore reserve, managed by the ACT Government, to allow for maintenance and firefighting activities.

**3.4 EMERGENCY SERVICES**

As identified, the source of bushfire risk is external to the Study area and that is likely to remain in perpetuity regardless of further future residential development in the area.

That being the case, the concept subdivision would be well serviced by the local RFS Brigades at Fernleigh Park, Jerrabomberra and Queanbeyan amongst many others in the Capital Region.

The proposed concept subdivision would significantly increase the number of residential structures in the area which would invariably increase demand for structural firefighting capabilities in the event of a fire. It would be assumed that this future demand will result in an increase in local firefighting resources and upgrading of existing facilities.

### 3.5 INFRASTRUCTURE

#### *Water Supplies -*

The proposed subdivision will be provided with reticulated water from the town's main water supply including fire hydrant system provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning.

#### *Other Infrastructure -*

- **Electricity Services** – Electricity power supply throughout the proposed concept subdivision will be via a new underground mains electricity service and will be provided in accordance with the specifications set out in Table 7.4a of PBP (2019)

- **Gas Services** – It is envisaged that gas supplies to any future residence will be by bottled gas supplies and therefore supplies and fittings are to comply with specifications set out in Table 7.4a of PBP (2019)

### 3.6 ADJOINING LAND

The study area is an undeveloped rural lot located within the greater Googong Township area, approximately 9 km due south of Queanbeyan central business district.

Land to the north of the study area is the recently developed residential land associated with Googong Neighbourhood 1 and 2.

Land to the west of the study area is the recently approved but yet to be developed residential land associated with Googong Neighbourhoods 3, 4 & 5.

Land to the south of the study area is predominantly grassland and open woodland for the purpose of livestock grazing.

To the east of the study area is the Googong Dam and associated Foreshore reserve which serves as 1 of the major water supplies for the Canberra / Queanbeyan area.

### 3.7 STRATEGIC BUSHFIRE CONSIDERATIONS CONCLUDING STATEMENT.

The Study Area is:

- designated Bushfire Prone.
- is currently dominated by Woodland fuels but likely to be Forest fuels given the conservation values into the future.
- is considered a moderate threat environment.
- has a recent but infrequent history of bush fire threat and impact.
- has open and slightly sloping terrain.
- has access to roads that comply with PBP 2019 and
- is near existing infrastructure and amenities.

In general terms, the proposed concept subdivision and subsequent rezoning of the study area to moderately increase residential land is consistent with the principles of Strategic Planning under PBP 2019.

The proposed lots will largely comply with the broad aims and objectives of PBP 2019 and there is excellent opportunity to provide a range of bushfire protection improvements that address the bushfire threat and the compliance requirements of PBP 2019.

Access arrangements for the proposed concept subdivision will comply.

The predominate vegetation type within the study area is conservatively classified as Woodland and Forest and while these do represent an elevated threat, given the large APZs this level of threat can be largely moderated.

The history of bushfire in the area demonstrates that the long term and ongoing threat remains from the areas surrounding the township where large areas of woody vegetation is predominant. In the event of a bushfire, the proposed concept subdivision is well positioned with emergency services located nearby.

## 4 BUSHFIRE PROTECTION AND PREVENTION MEASURES

Although only at concept subdivision design stage, it is possible to anticipate what Bushfire Protection and Prevention Measures (BPMs) would be required for the residential subdivision to satisfy the broad aims and objectives of PBP 2019 as well as specific considerations detailed in Chapter 5 – Residential and Rural Residential Subdivisions.

The intent of these BPMs is to provide for the protection of human life including the safety of firefighters and occupants, assist building survival during a bush fire minimising the impacts on structures while having due regard to development potential, site characteristics and protection of the environment.

Bush fire protection measures generally serve a dual purpose by protecting the site from external fire threat but also containing fire within the site should it occur, stopping it from escaping onto adjoining lands. Where specific prevention measures are required, these will be detailed separately.

The concept subdivision in its current form is capable of satisfying the performance criteria for residential subdivisions and therefore the broad aims and objectives of PBP 2019.

### 4.1 ASSET PROTECTION ZONES (APZs) & SETBACKS

#### Discussion - APZs:

APZs and setbacks provide a buffer zone between identified hazard and structures. Setbacks will ensure appropriate separation from hazard vegetation while APZs are bands of landscape managed to minimise fuel loads and reduce potential radiant heat levels, flame, localised smoke and ember attack.

APZs are determined through the analysis of hazard (unmanaged vegetation) and slope (Figure 6 & 13) and crossed referenced with minimum setback dimensions provided for residential subdivisions in Table A1.12.2 PBP 2019.

The dominant hazard lies to the south and east of the concept subdivision with areas of future Woodland and Forest will remain persistent for the life of the development. Protection measures, commensurate to this hazard will be applied.

Where the residential lots abut unmanaged hazard vegetation, building envelopes for the proposed subdivision will be designed to ensure adequate separation for future residences from the hazard vegetation.

The APZ and setback dimensions will ensure that any future dwelling is not subject to a radiant heat flux greater than or equal to 29 kW/m<sup>2</sup> and therefore comply with the requirements of Table A1.12.2 PBP 2019.

Prior to future development the dwellings on all lots identified will require a BAL assessment to determine construction level.

APZs are to be established and managed in perpetuity and in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019)

**Recommendations:**

- The APZ and setback dimensions (Figure 19) are to ensure that any potential building footprint is not exposed to a radiant heat flux level greater than or equal to 29 kW/m<sup>2</sup> and therefore comply with the requirements of Table A1.12.2 PBP 2019.
- APZs are to be established and managed in perpetuity in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019)
- At the commencement of building works, and in perpetuity, all land within the APZ is to be managed as IPA in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019).
- Future development of the rezoned lots identified as subject to bushfire attack will require a subsequent BAL assessment to determine construction level in accordance with the relevant sections of Australian Standard AS3959-2018 Amd 2 Construction of

buildings in bush fire-prone areas as amended, or NASH Standard (1.7.14 updated) National Standard Steel Framed Construction in Bushfire Areas – 2014 as appropriate.

## **4.2 LANDSCAPING**

**Recommendations:**

- All landscape within areas identified as APZ within the proposed concept subdivision will require management in perpetuity as an Inner Protection Area (IPA) in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019)
- All roadside landscaping will require management in perpetuity and in accordance with the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019).

### 4.3 ACCESS

#### Discussion – Access:

Future access to the concept subdivision from Old Cooma Road will be via Googong Neighbourhoods 3, 4 and 5 to the West and via Googong Neighbourhoods 1 and 2 to the North.

Any future proposal will be designed with an interconnected road network including perimeter roads and multiple connection points with Googong Neighbourhoods 1 to 5 enabling through road access for the estate.

In its current layout the concept subdivision general is capable of satisfying all acceptable solutions for access under PBP 2019

#### Recommendations:

- Property access road to be provided and maintained in accordance with the specifications and requirements set out in Table 5.3b of PBP 2019.

### 4.4 SERVICES – WATER, ELECTRICITY AND GAS:

#### Discussion – Water supplies:

New residences would be required to provide water supplies and electricity services in accordance with the specifications set out in Table 7.4a of PBP (2019).

#### Recommendations:

**Water Supplies** - Water supplies to be provided in accordance with the specifications set out in Table 7.4a of PBP (2019).

**Electricity Services** – Electricity power supply throughout the Subject Area will be either via new underground mains electricity service or a stand-alone off grid photovoltaic electricity power supply and will be provided in accordance with the specifications set out in Table 7.4a of PBP (2019).

**Gas Services** – It is envisaged that gas supplies to any future residence will be by bottled gas supplies and therefore, supplies and fittings are to comply with specifications set out in Table 7.4a of PBP (2019).

## 5 CONCLUSION

This report documents the findings from a Bush Fire Strategic Study conducted in support of a planning proposal that will result in a moderate expansion of residential areas to the south and east of Neighbourhoods 1B and 3-5 of Googong Township.

The report establishes the level of bushfire threat to the study area and examines a range of principles for the concept subdivision proposal to be regarded as suitable for development and that any future development can satisfy the broad aims and objectives of PBP 2019.

The proposed concept subdivision and rezoning of the Study area is seen as being consistent with the principles of Strategic Planning under PBP 2019.

Due to a predicted woodland and forest setting on slightly undulating topography, the surrounding environment possesses a relatively moderate to high bushfire threat to the Study area. This threat however can be moderated to an acceptable level by the adoption of the standard suite of protection measures offered by PBP 2019 and for which the proposed development can largely comply.

The concept subdivision proposal provides adequate space for the establishment and ongoing maintenance of setbacks and APZs.

Access to the study area will be well provided with multiple access points to Old Cooma Road via Googong Neighbourhoods 3, 4 and 5 to the West and via Googong Neighbourhoods 1 and 2 to the North.

Water supplies and other utilities will be capable of satisfying the acceptable solutions detailed in PBP 2019.

Based on the BFSS and the recommendations contained in this report, the proposed concept multi-lot residential subdivision will be capable of:

- ensuring land is suitable for development in the context of bush fire risk;
- ensuring new development on BFPL will comply with PBP
- minimising reliance on performance-based solutions;
- providing adequate infrastructure associated with emergency evacuation and firefighting operations; and
- facilitating appropriate ongoing land management practices.

And therefore, the proposal is deemed capable of meeting the underlying principles of strategic planning and should be supported.

## 6 REFERENCE

- ePlanning Spatial Viewer, Department of Planning Industry and Environment, accessed 25 November 2022, <https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>
- FireMaps (FPA Australia, 2021), accessed 15 November 2022, <https://maps.fpaofiremaps.com.au>
- Keith D. (2004) "Ocean Shores to Desert Dunes", Department of Environment and Conservation, Sydney.
- NSW Rural Fire Service. (2019) "Planning for Bushfire Protection". Sydney (PBP (2019))
- SEED (NSW Government, 2022) NSW State Vegetation Type Map, accessed 15 November 2022, [https://geo.seed.nsw.gov.au/Public\\_View/index.html?viewer=Pblic\\_Viwer&locale=enAU&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED\\_Catalog.185.Formation,SEED\\_Catalog.185.Class,SEED\\_Catalog.185.Labels,SEED\\_Catalog.185.Vegetation%20Group](https://geo.seed.nsw.gov.au/Public_View/index.html?viewer=Pblic_Viwer&locale=enAU&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED_Catalog.185.Formation,SEED_Catalog.185.Class,SEED_Catalog.185.Labels,SEED_Catalog.185.Vegetation%20Group)
- SEED (NSW Government, 2022) Fire Extent and Severity Mapping (FESM), accessed 15 November 2022, [https://geo.seed.nsw.gov.au/Public\\_View/index.html?viewer=Public\\_Viwer&locale=enAU&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED\\_Catalog.203.NPWS%20Fire%20History](https://geo.seed.nsw.gov.au/Public_View/index.html?viewer=Public_Viwer&locale=enAU&runWorkflow=AppendLayerCatalog&CatalogLayer=SEED_Catalog.203.NPWS%20Fire%20History)
- Six Maps, NSW Department of Finance and Services, accessed 25 June 2022, <https://maps.six.nsw.gov.au/#>
- Standards Australia, (2018) "AS/NZS 3959-2018 Construction of buildings in bushfire-prone areas."

---

# ATTACHMENT A – APZs & LANDSCAPING

## Inner protection areas (IPAs)

The IPA is the area closest to the asset and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and be 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 dwelling, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

### Trees:

- 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 ground
- canopies should be separated by 2 to 5m
- 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
- shrubs should not be located under trees
- shrubs should not form more than 10% ground cover
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

### Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaves and vegetation debris should be removed.

## Outer protection areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. Vegetation within the OPA can be managed to a more moderate level. The reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathways to crown fuels; 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.

In practical terms the OPA is an area where there is maintenance of the understorey and some separation in the canopy.

When establishing and maintaining an OPA the following requirements apply:

### Trees:

- tree canopy cover should be less than 30%
- trees should have canopy separation
- canopies should be separated by 2 to 5m

### Shrubs:

- shrubs should not form a continuous canopy
- shrubs should form no more than 20% of ground cover

### Grass:

- should be kept mown (as a guide grass should be kept to no more than 100mm in height)
- leaf and other debris should be mown, slashed or mulched.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA to the standards given above should be undertaken on an annual basis, in advance of the fire season, as a minimum.

In Australia, bush fires are a natural and essential aspect of the landscape as many plants and animals have adapted to fire as part of their life cycle. However, development adjacent to bush land areas has increased the risk of fire impacting on people and their assets. The impact on property and life can be reduced with responsible preparation and management of bush fire hazards.

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps in reducing vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

This Appendix sets the standards which need to be met within an APZ.

## A4.1 Asset protection zones

An APZ is a fuel-reduced area surrounding a built asset or structure.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at: [www.rfs.nsw.gov.au/resources/publications](http://www.rfs.nsw.gov.au/resources/publications).

An APZ provides:

- a buffer zone between a bush fire hazard and an asset
- an area of reduced bush fire fuel that allows suppression of fire
- an area from which backburning or hazard reduction can be conducted,
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset
- damage to the built asset from intense radiant heat
- ember attack.

The APZ should be located between an asset and the bush fire hazard.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an inner protection area (IPA) and an outer protection area (OPA).

# ATTACHMENT B - ACCESS

**Table 7.4a** *Continued*

| PERFORMANCE CRITERIA                                                                                                                                    | ACCEPTABLE SOLUTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The intent may be achieved where:                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation;</li> </ul> | <ul style="list-style-type: none"> <li>property access roads are two-wheel drive, all-weather roads.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>the capacity of access roads is adequate for firefighting vehicles.</li> </ul>                                   | <ul style="list-style-type: none"> <li>the capacity of road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>there is appropriate access to water supply.</li> </ul>                                                          | <ul style="list-style-type: none"> <li>hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005;</li> <li>There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>firefighting vehicles can access the dwelling and exit the property safely.</li> </ul>                           | <ul style="list-style-type: none"> <li>at least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road;</li> <li>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.</li> </ul> <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> <li>minimum 4m carriageway width;</li> <li>in forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay;</li> <li>a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;</li> <li>property access must provide a suitable turning area in accordance with Appendix 3;</li> <li>curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;</li> <li>the minimum distance between inner and outer curves is 6m;</li> <li>the crossfall is not more than 10 degrees;</li> <li>maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and</li> <li>a development comprising more than three dwellings has formalised access by dedication of a road and not by right of way.</li> </ul> <p>Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</p> |

## A3.3 Vehicle turning head requirements

Dead ends that are longer than 200m must be provided with a turning head area that avoids multipoint turns. "No parking" signs are to be erected within the turning head.

The minimum turning radius shall be in accordance with Table A3.2. Where multipoint turning is proposed the NSW RFS will consider the following options:

**Figure A3.3**

Multipoint turning options.

