TRAVERS BUSHFIRE & ECOLOGY

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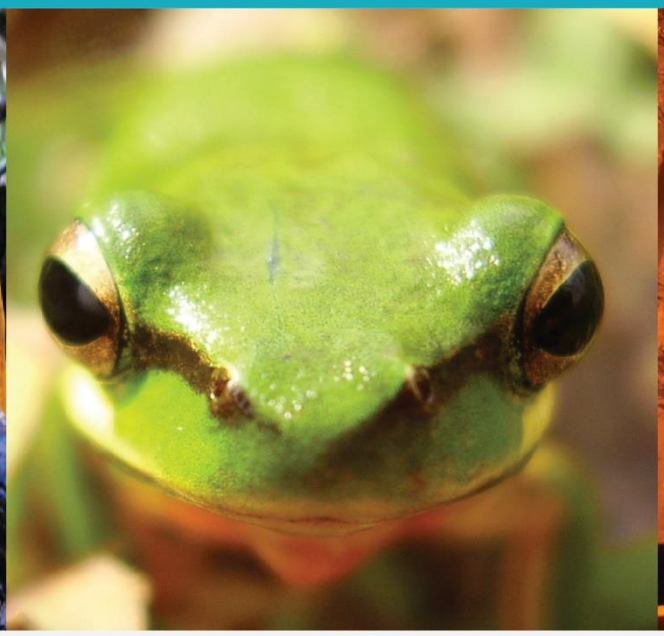

BUSHFIRE PROTECTION ASSESSMENT

Proposed Residential Subdivision – 'Stage 4'

Lot 123 DP 1063357

598 Gresford Road, Vacy

Under Section 100B of the Rural Fires Act (1997)

11 June 2025

(REF: CORN06INT)

BUSHFIRE PROTECTION ASSESSMENT

Proposed Residential Subdivision – Stage 4

Lot 123 DP 1063557

598 Gresford Road, Vacy

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Date:	11/06/25
File:	CORN06INT
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Disclaimer:

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The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features is to be confirmed by a registered surveyor.

This report has been produced in accordance with the PRACTICE NOTE - Use of Generative Artificial Intelligence (Gen AI) dated 28 November 2024.

EXECUTIVE SUMMARY

Travers bushfire & ecology (TBE) has been engaged by Cornish Group to undertake a bushfire protection assessment for a proposed residential subdivision located at 598 Gresford Road, Vacy. The development involves the construction of two stages of lot residential subdivision, Stage 4 and Stage 5. This report will assess Stage 4 only.

Bush Fire Prone Land (BFPL) mapping was certified on the 7 March 2025 and as such, the development site is situated on BFPL (Category 3), mapped by the Dungog Shire Council. This triggers a formal assessment by the Council in respect of the NSW Rural Fire Service (RFS) policy against the provisions of *Planning for Bush Fire Protection 2019 (PBP).* Under *S100B* of the *Rural Fires Act 1997 (RF Act)* the development is required to obtain a Bush Fire Safety Authority (BFSA) from the NSW RFS prior to the granting of development consent.

The assessment takes into consideration minimum building setbacks as per Dungog Development Control Plan (DCP) 2019. These building setbacks align with the required Asset Protection Zones (APZs) and will need to be further addressed in the Statement of Environmental Effects (SoEE) to ensure capacity for residential dwellings, specifically for Lot 401.

The proposed residential development must ensure that the extent of bushfire attack that can potentially impact a building envelope should not exceed a radiant heat flux of 29kW/m^2. This rating assists in determining the size of the APZ, which provides the necessary defendable space between vegetation that could potentially impact a building. The assessment found that adequate APZs are provided, (with a proposed perimeter road) and prescribed building envelope setbacks can achieve APZs.

In recognition of the requirements of *PBP* and the bushfire threat posed to the site by the nearby vegetation; *TBE* proposes the following combination of bushfire measures.

- APZ setbacks required for BAL-29 by the minimum setbacks outlined in *PBP* for all aspects as shown in Table 2-2 and as generally depicted in Schedule 1.
- No gas, water, communications, or sewer utilities are proposed. The electrical services proposed must comply with *PBP* provisions set out in Section 3.4. Dedicated water is also required to meet Section 3.4 of *PBP* at the dwelling DA stage.
- Access to each lot, including on-site parking is to comply with section 3.3 of this report. Signage (no through road) is to be provided at the 'dead end' road in Stage 4.
- Future dwelling construction in compliance with *PBP* and the appropriate construction sections of *AS3959-2018*.

TBE makes the following recommendations:

Recommendation 1 – The development including APZs is as generally indicated on the attached Schedule 1- Plan of Bushfire Protection Measures and in Table 2-1 of this report.

Recommendation 2 – Reassess building envelope placement on Lot 401 (Stage 4) to ensure compliance with Dungog DCP setbacks and functional siting for future dwellings.

Recommendation 3 – Dead-end roads are illustrated in Stage 4. However, given the rural-residential, low-density nature of the site and the planned conversion of lots from grassland to become a managed Inner Protection Area (IPA), the bushfire hazard will be minimised, justifying meeting the performance criteria (see Section 3.3). It is noted that this is the end of the current zoning footprint.

Recommendation 4 – Street landscaping to be managed in accordance with *Appendix 4* of *PBP* and as shown in Schedule 2- Management of Assessment Protection Zones.

Recommendation 5 – Incorporate dedicated static water supply systems meeting *PBP* provisions (20,000L static water tanks per lot for rural residential developments) for each lot at the dwelling DA stage as a restriction to the title. Tanks must include compatible fittings and accessible clear zones for firefighting vehicles and above-ground water pipes must be constructed from non-combustible materials (metal).

Recommendation 6 – Electrical reticulation is proposed and must be in accordance with *PBP* provisions. Implement a restriction on title to prevent the use of bottled gas connections to houses. Small, bottled gas is permissible for BBQs.

Recommendation 7 – Ensure ongoing on-site vegetation management to retain APZ functionality, particularly on steep slopes (e.g. southern and eastern aspects).

Recommendation 8 – Vegetation within the site boundary must be maintained, consistent with Schedule 2, according to Appendix 4 of *PBP*.

GLOSSARY OF TERMS

AHIMS	Aboriginal Heritage Information System
APZ	asset protection zone
AS1596	*Australian Standard – The storage and handling of LP Gas*
AS2419	*Australian Standard – Fire hydrant installations*
AS3745	*Australian Standard – Planning for emergencies in facilities*
AS3959	*Australian Standard – Construction of buildings in bushfire-prone areas 2018*
BAL	*bushfire attack level*
BCA	*Building Code of Australia*
BPMs	Bush fire protection measures
BFSA	Bush Fire Safety Authority
DA	development application
EP&A Act	*Environmental Planning & Assessment Act 1979*
FDI	Fire Danger Index
GFDI	Grassland Fire Danger Index
IPA	inner protection area
LEP	Local Environmental Plan
LGA	local government area
m	metres
NCC	*National Construction Code*
OPA	outer protection area
PBP	*Planning for Bush Fire Protection 2019*
RF Act	*Rural Fires Act 1997*
RFS	NSW Rural Fire Service
TBE	*Travers bushfire & ecology*

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1. INTRODUCTION

Travers bushfire & ecology (TBE) has been engaged by Cornish Group to undertake a bushfire protection assessment for a proposed rural-residential subdivision (zoned R5) located at 598 Gresford Road, Vacy ('the subject site'), described as Stage 4, located on Lot 123 DP 1063557. The site is mapped as bush fire prone under section 10.3 of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*.

An inspection of the proposed development site and surrounds was undertaken by Dr Grahame Douglas on 17 August 2024 to assess the topography, slopes, aspect, drainage, vegetation, and adjoining land use. The identification of existing bushfire measures and a visual appraisal of potential bushfire hazards and threats were also undertaken.

The proposed layout design for Stage 4 is illustrated in Figure 1-1. This is a continuation of previously approved developments (Stages 1 to 2).

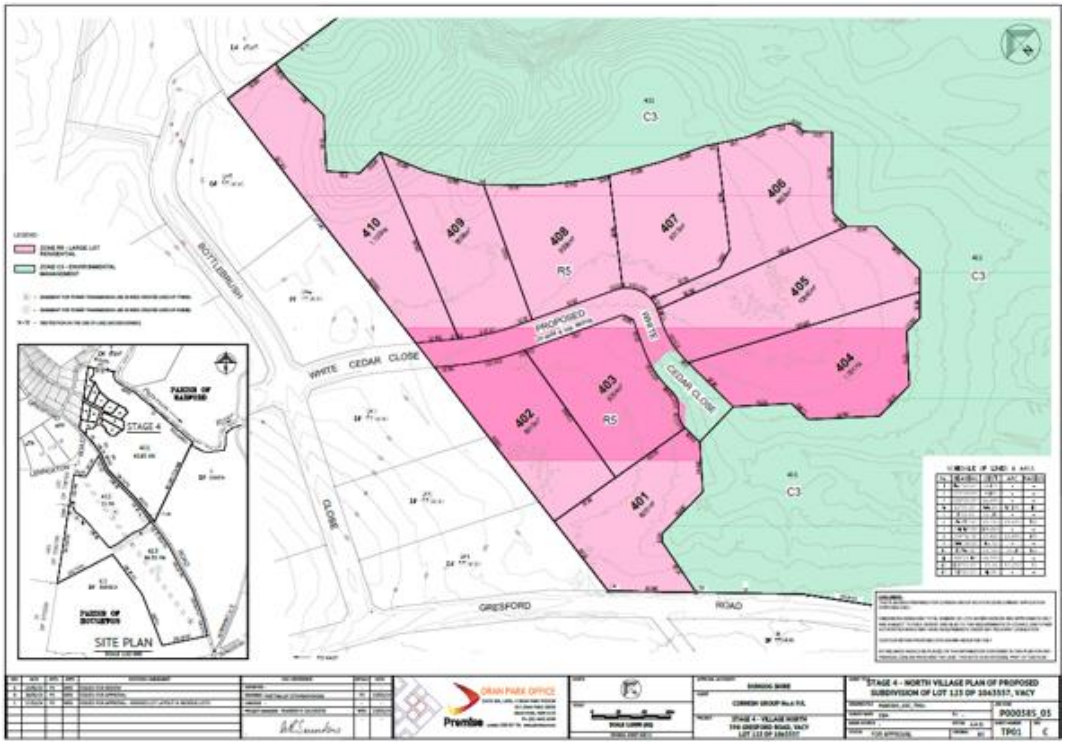


Figure 1-1 – Proposed development layout – Stage 4
(Source: Premise, A, PROPOSED SUBDIVISION DEVELOPMENT 598 GRESFORD ROAD (LOT 412), VACY VILLAGE (STAGE 5), Rev B, dated 5.09.2024)

1.1 Aims of the assessment

The aims of the bushfire protection assessment are to:

- review the bushfire threat to the development,
- undertake a bushfire attack assessment in accordance with *Planning for Bush Fire Protection 2019* (*PBP),* and
- provide advice on mitigation measures, including the provision of asset protection zones (APZs), construction standards and other specific fire management issues.

1.2 Proposed development

The proposed development forms part of a broader multi-staged rural-residential subdivision at Lot 52 DP 1089481, building on the foundation established by Stages 1 and 2 (refer to Figure 1-3). A BPA for these earlier stages was prepared by *TBE* in March 2019, using the methodology outlined in the Pre-release *Planning for Bush Fire Protection* (*PBP* 2018). While *PBP* 2006 was the legally referenced document at the time, *PBP* 2018 was applied on a performance basis. Following its pre-release, *PBP* 2019 was then legislated in mid-2019 to coincide with the enactment of the National Construction Code 2019.

For Stages 1-2, alternative solutions were implemented to remove the need for continuous perimeter roads, through roads, and a secondary access point to the subdivision. These solutions were justified by several considerations. Gresford Road serves as a key perimeter road, providing a buffer against woodland vegetation to the south, while surrounding lands consist of managed and unmanaged grassland with planned future development to the east and west, further mitigating bushfire hazards.

The road design for Stages 1-2 includes Gresford Road to the south and a private access driveway to the west, which provides safe access for firefighting services to hazardous vegetation and the proposed lots. The internal roads are located over 50 meters from grassland and 100 meters from woodland vegetation, allowing for safe evacuation of residents and firefighting vehicle access. While the eastern boundary lacks a perimeter road, the planned development of adjoining land will remove this hazard in the future. In the interim, a turning head at the eastern end of Road No. 2, as per Figure 3.1, is recommended for firefighting access and egress.

It is important to note that in the previous stages, a road link was provided for Stage 4 to reach the developable area at the end of the zoning. The future road link through Stage 3 to the adjoining boundary (Spotted Gum Close) is the future loop road link through the northwest.

Stage 4 is built on infrastructure and bushfire safety measures established in the earlier stages. Stage 4 includes 10 lots. The road continues to function as a critical internal road, providing a buffer against bushfire risks and serving as the primary access route for residents and emergency services. Internal road layouts and APZ configurations are designed to integrate seamlessly with the prior stages, creating a cohesive and compliant subdivision framework.

Stage 4 has been assessed under *PBP*, which emphasises case-by-case evaluations of access solutions for large-lot rural-residential subdivisions. Stage 4 provides for one access point. *PBP* states, *'where access or egress traverses' forest, woodland, or heath vegetation, secondary access is required to connect to an alternative point on the existing public road system'*.

Stage 4 area is predominately grasslands, and individual sites will be managed as an IPA. There are some future proposed restoration plantings to occur along the north boundary of Stage 4. However, access will not traverse forest, woodland, or heath vegetation. This assessment deems the single-point access justified in relation to the 10 lots and adjoining existing lots.

The access points provided for Stage 4 are in accordance with Dungog DCP provisions and *PBP* requirements. The proposed development seeks to balance bushfire safety, compliance with *PBP*, and the practicalities of large-lot rural residential design.

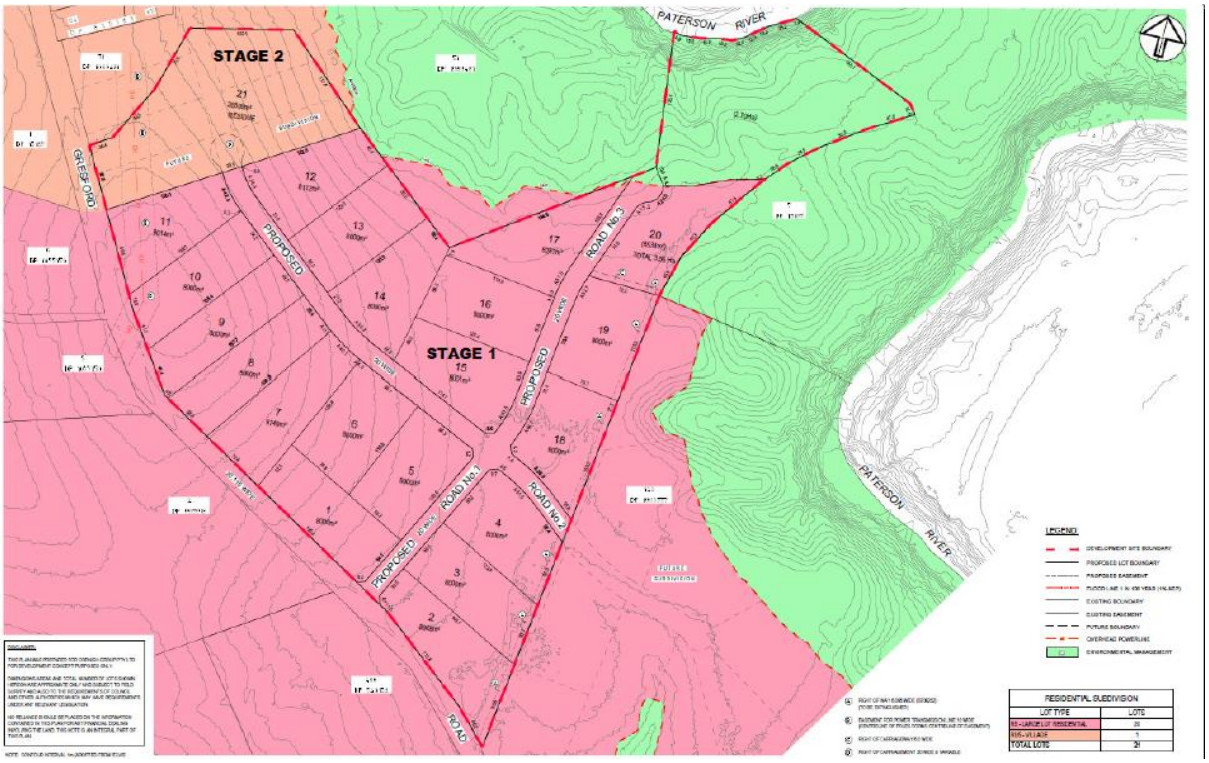


Figure 1-2 – Stage 1 and Stage 2 Vacy subdivision
(Source: TBE, 2019, Bushfire Protection Assessment, Geolyse dated 12/09/2018, ref. 319001)

1.3 Site description

The site is located within the Dungog Shire Council local government area (LGA) and is situated 1.2 kilometres south of Vacy township and 5.6 kilometres northwest of Paterson. The site is predominantly rural, featuring a mix of cleared agricultural land and patches of native vegetation. The existing vegetation mainly consists of grasslands maintained through grazing practices. Within 140m of the site, there is a mix of forest and forested wetlands vegetation formations.

Topographically, the site displays gentle undulations, with steeper gradients evident along the natural watercourses and drainage lines. A central ridgeline runs eastward, contributing to the varied slopes extending north and south. Elevations across the site range between 10 and 190 meters above sea level. To the south and east, the terrain transitions into expansive farmland, interspersed with clusters of trees, while the northern and western sections are characterized by denser vegetation, connecting to larger tracts of bushland in the broader landscape.

1.3.1 Surrounding environment

The surrounding environment reflects a blend of rural residential properties, active agricultural operations, and significant natural bushland. Vacy's temperate climate and the flammable nature of the local vegetation, coupled with the area's varied topography, contribute to a heightened bushfire risk, particularly during dry seasons. The broader landscape's combination of open fields, forested hills, and waterways forms a complex bushfire landscape, underscoring the need for comprehensive bushfire protection planning.

1.4 Legislation and planning instruments

Table 1-1 – Legislation and planning instruments

Is the site mapped as bush fire prone?	Yes (Refer to figure 1-3).
Proposed development type	Rural-residential subdivision.
Is the development considered integrated for the purposes of Section 100B of the *Rural Fires Act 1997?*	Yes
Is the proposal located in an Urban Release Area as defined under Clause 273 of the EP&A Regulations?	No.
Zoning	C3 - Environmental Management R5 - Large Lot Residential
Does the proposal rely on a performance solution?	No.

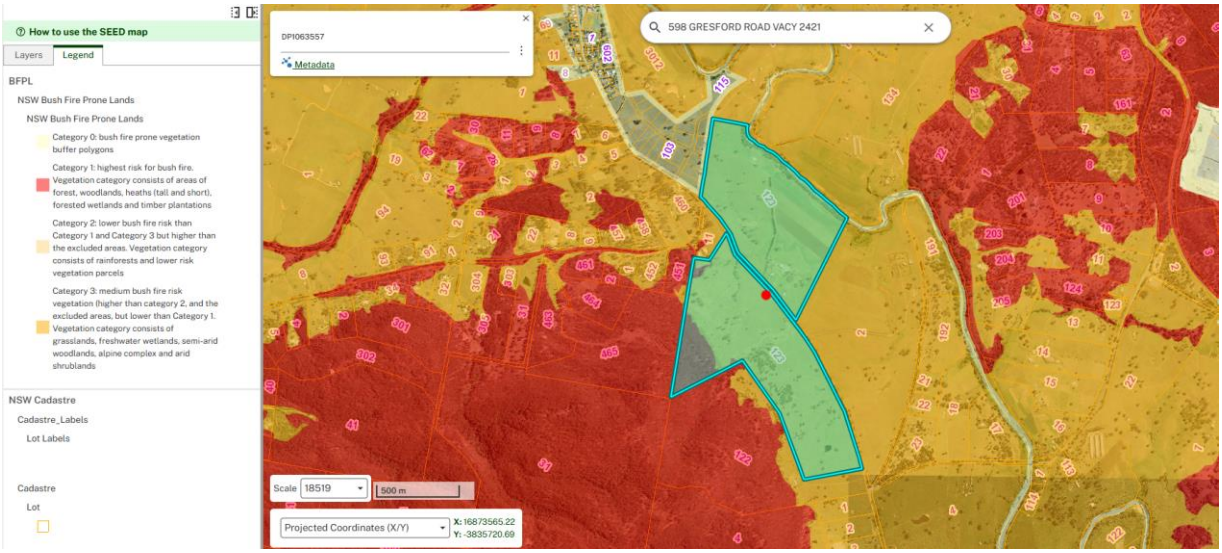


Figure 1-3 – Bushfire prone land mapping
(Source: SEED, obtained 26/5/2025)

1.4.1 Permissibility

The site, being a rural-residential subdivision, is located within the Dungog Shire Council, local government area (LGA), and is currently zoned as a mixture of C3 – Environmental Management and R5 – Large Lot Residential. *Dungog Shire Council LEP 2023 (DSC LEP)* permits both dwelling houses and roads with consent from the council within these zones. Part 4 (Principal development standards) of DSC LEP 2023 provides the permissibility through prescribed development controls for rural-residential subdivisions within the Dungog LGA. (Figure 1-5 below).

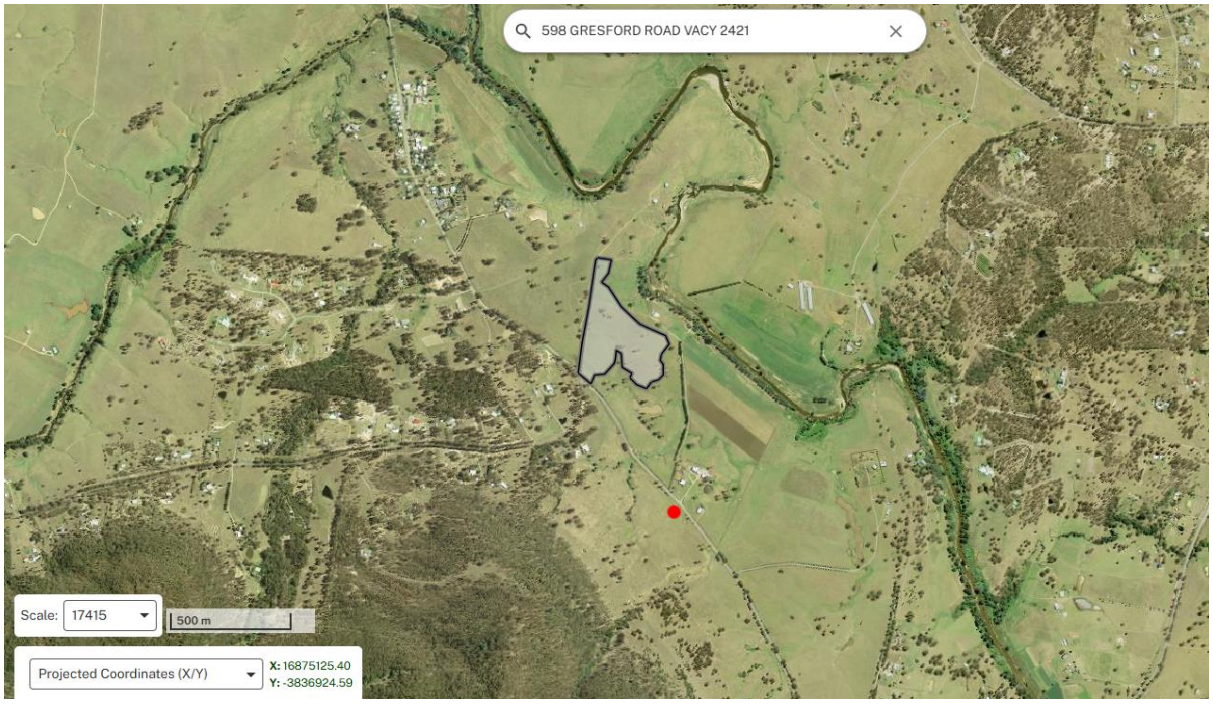


Figure 1-4 – Aerial appraisal
(Source: Nearmap Aerial Imagery 2025, obtained 6/02/2025)

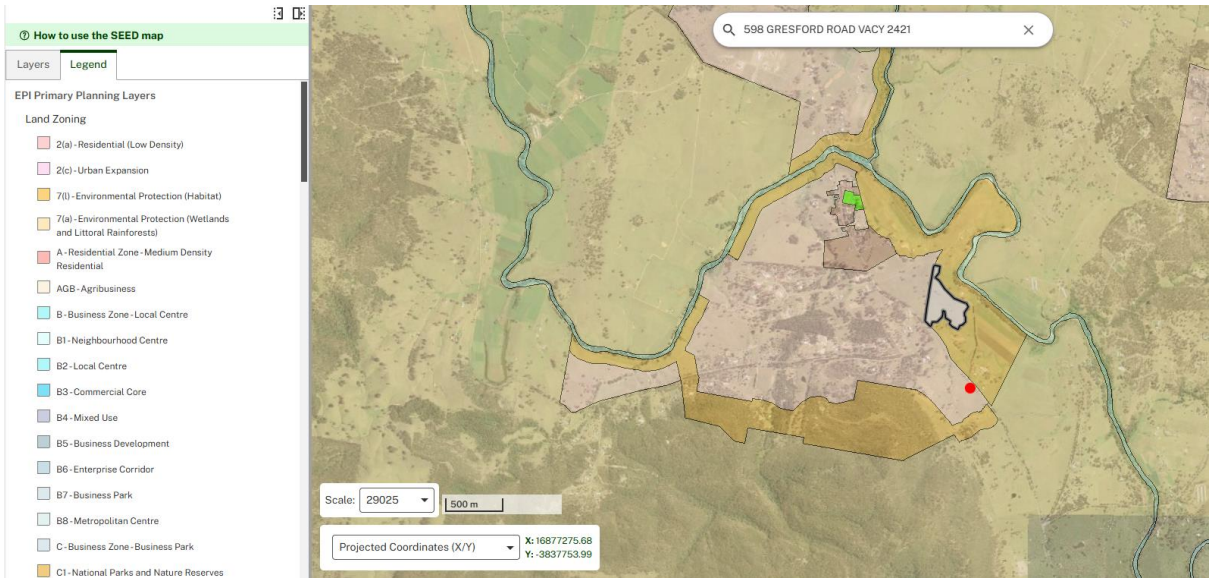


Figure 1-5 – Zoning
(Source: NSW Planning Portal 202, obtained 6/02/2025)

1.4.2 Legislative context

The key legislation in New South Wales (NSW) for bushfire assessment and management include the *EP&A Act*, the *Rural Fires Act 1997* (*RF Act)* and their regulations being the Environmental Planning and Assessment Regulation (EP&A Regulation) and the RF Regulation.

For subdivisions which are for residential or rural-residential purposes, developers must apply for a BFSA in accordance with section 100B of the *RF Act* were mapped as being bush fire prone. The subject land is mapped as being bush fire prone land under section 10.3 of the *EP&A Act*, and s100B does apply.

Standards for residential subdivisions are outlined in Chapter 5 of *PBP* and are considered in the case of this development.

1.4.3 Bush Fire Prone Land

Under Section 10.3 of the *EP&A Act*, the NSW RFS is responsible for guiding local councils in mapping bushfire-prone land (BFPL). The site is mapped as being bush fire prone (Figure 1-3) by Dungog Shire Council under section 10.3 of the *EP&A Act.*

1.4.4 Planning for Bush Fire Protection 2019 (PBP)

PBP aims to provide for the protection of human life and minimise impacts on property from the threat of bush fire while having due regard to development potential, site characteristics and protection of the environment. The objectives of *PBP* are to:

- afford buildings and their occupants protection from exposure to a bushfire.
- provide a defendable space to be located around buildings.
- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
- ensure that appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
- ensure that appropriate operational access and egress for emergency service personnel and occupants is available.
- provide for ongoing management and maintenance of bushfire protection measures (BPMs); and
- ensure that utility services are adequate to meet the needs of firefighters.

Under the *EP&A Act*, a subdivision is defined as "*the division of land into two or more parts, which after the division, would be adapted for separate occupation, use or disposition….".*

1.4.5 Dungog Development Control Plan (DCP) 2018

The *Dungog Development Control Plan* (Dungog DCP) 2019 is a regulatory framework that ensures land use and development in the region, including subdivisions like the Vacy development, align with community expectations and environmental constraints. For land zoned R5 Large Lot Residential, such as the subject site, the DCP mandates minimum building line setbacks to balance residential amenities, bushfire safety, and environmental management. These setbacks are:

- 70m from a main road, such as Gresford Road.
- 30m from any other public road.
- 15m from new roads within the subdivision. Additionally, side and rear setbacks for R5 zoning require a minimum of 10m.

These setbacks have been acknowledged and applied to Stage 4 (see Schedule 1 mapping). However, the Council may vary the DCP requirements at DA stage.

1.5 Environmental and Aboriginal heritage constraints

Submission requirements require the following environmental and heritage considerations that have the potential to be a constraint for implementing APZs within the site and may require further assessments before construction proceeds within a site:

- identification of any significant environmental features on the property.
- the details of any threatened species, population or ecological community identified under the *Biodiversity Conservation Act 2016 (BC Act)* and/ or the *Environmental Planning and Assessment Act 1979 (EPBC Act)* that is known to the applicant to exist on the property.
- the details and location of any Aboriginal object (within the meaning of the *National Parks and Wildlife Act 1974)* or Aboriginal place (within the meaning of the Act) that is known to the applicant to be situated on the property.

The following sources databases were reviewed to determine whether any environmental and Aboriginal heritage constraints were present within the proposed site:

Table 1-2 – Environmental and heritage constraints

Potential constraint	Database
Aboriginal Heritage significant sites and places.	Aboriginal Heritage Information Management System (AHIMS).
Threatened Ecological Communities (TECs).	Threaten Ecological Communities Greater Sydney Dataset (NSW SEED Portal).
Threatened Species (flora and fauna)	NSW BioNet Species Sightings Data Collection (NSW SEED Portal)
Watercourses	NSW Hydrography Dataset (NSW SEED portal)

Searches of each database used a 50m buffered area from the site boundaries to identify features.

A basic search of the AHIMS database identified no known significant Aboriginal sites or places. No significant Aboriginal heritage sites have been confirmed within the study area; however, further ongoing engagement with local Aboriginal communities is recommended to ensure compliance with the *National Parks and Wildlife Act 1974* and to mitigate any potential impacts on undetected heritage values.

The site features a few minor unnamed gullies and depressions that traverse the area, primarily flowing eastward into the Paterson River. These natural hydrological features create localised topographical variations, contributing to the site's gently undulating terrain. The depressions which vary in size, play a crucial role in supporting the remnant vegetation and maintaining ecological connectivity within the site.

There are three (3) known endangered populations within Dungog Shire LGA. These are:

- *Acacia pendula* population in the Hunter Catchment (recorded 2013)
- *Eucalyptus camaldulensis* population in the Hunter Catchment
- *Cymbidium canaliculatum* population in the Hunter Catchment (recorded 1926)

None of these endangered populations were located onsite within the study area. One (1) threatened species – *Eucalyptus glaucina* (Slaty Red Gum) – was observed within the site. No threatened ecological communities (TECs) were observed within the development footprint.

PCT 3446 does not meet the criteria to be listed as Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions as listed within paragraph 1 of the Final Determination (Permian sediments). The subject-site is not located on lands mapped as Biodiversity Values Land (see Figure 1-7).

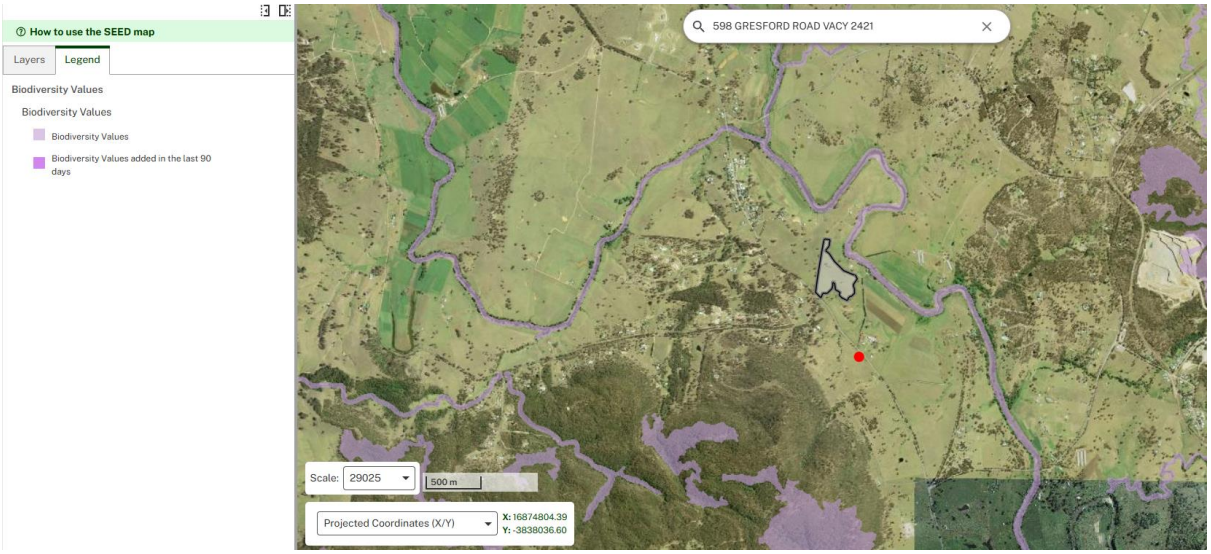


Figure 1-6 – Biodiversity value mapping
(purple = Biodiversity values)

(Source: NSW SEED Portal 2024, dated 6/02/2025)

2. BUSHFIRE THREAT ASSESSMENT

To assess the bushfire threat and to determine the required width of an APZ for development a bushfire assessment must include the determination of the regional fire weather conditions (FDI) and an assessment of the predominant vegetation that has the potential to be a bushfire threat to the development, as well as the effective slope within such vegetation. The known fire history for the development site and surrounding landscape is also considered.

2.1 Fire history

A fire history search of the development site and its surrounding areas was conducted using the NSW National Parks and Wildlife Services (NPWS) 'NPWS Fire History- Wildfires and Prescribed Burns' database within the NSW SEED Portal.

There have been no known fires to have directly affected the site itself. (Refer to Figure 2-1). However, the region is dominated by grassland and rural bushland making it susceptible to fast-spreading grassfires and bushfires during dry and windy conditions. The following bushfires have been recorded in the vicinity of the site:

- During 2002-2003, a large grassland fire was recorded within 15 kilometres south-east of the site.
- A small, localised fire occurred in 2006, approximately 12 kilometres north of the site.
- In 2013, the Hunter Region bushfires occurred, 18 kilometres south of Gresford Road which was classified as a major fire event, fuelled by dry grass and windy conditions.
- In 2017, another fire was recorded 10 kilometres west of the site, burning through farmland and scrub.
- The 2019-2020 'Black Summer' fires impacting the Hunter region, included a fire approximately 16 kilometres east of Gresford Road.

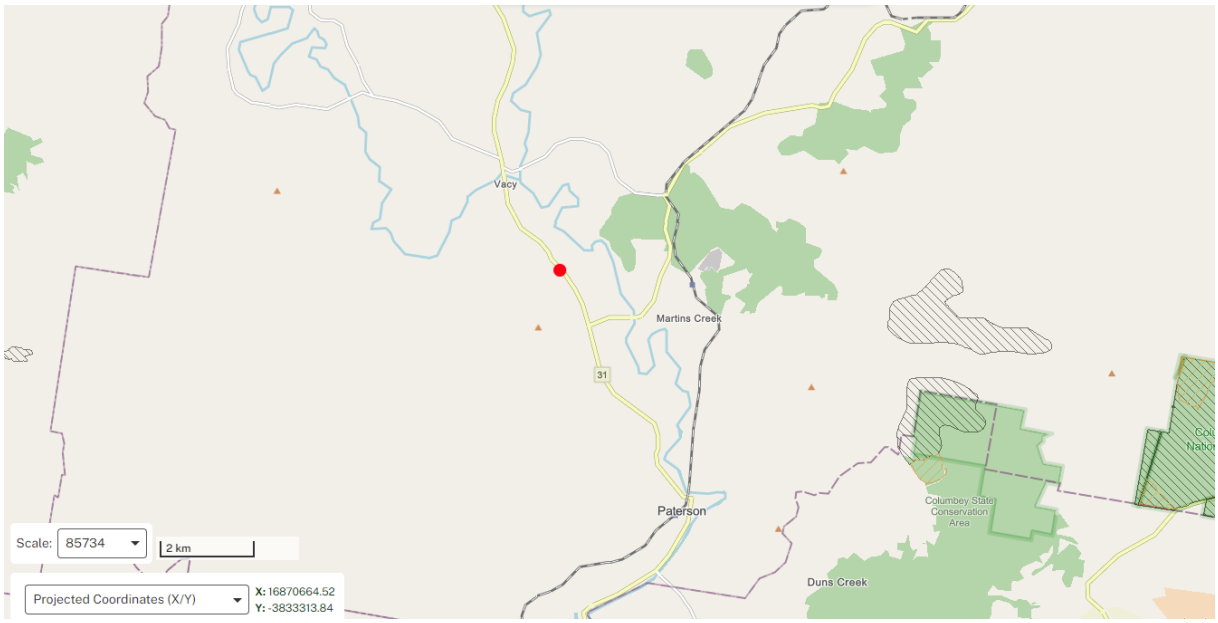


Figure 2-1 – Fire history
(Source: NSW SEED Portal 2024, dated 16.10.24)

2.2 Predominant vegetation

The *PBP* guidelines require identifying the predominant vegetation formation within 140m of a proposed building envelope using David Keith's 2004 classifications. Vegetation data for the site was sourced from the NSW SEED Portal and verified through site assessments. The predominant vegetation aligns with the Hunter Subregion of the Sydney Basin Bioregion and includes key Plant Community Types (PCTs): PCT 3433 - Hunter Coast Foothills Spotted Gum Ironbark Forest, PCT 3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest, and PCT 4042 - Lower North Riverflat Eucalypt-Paperbark Forest.

The vegetation is primarily grasslands with isolated tree patches and riparian vegetation, showing varied conditions. High canopy cover and species diversity are notable near watercourses, while fragmentation from historical land use is evident in other areas.

Planted native vegetation in Stage 4 has been identified. Within this area, it has been assessed and classified as remnant vegetation under Appendix A1.11 of *PBP*, based on its size, structure, and potential fire behaviour. The classification is justified because the vegetation strip is thin, narrow, and fragmented, covering less than 1 hectare, with limited connectivity to larger vegetated areas. These characteristics reduce its potential to support significant fire runs.

Under *PBP A1.11*, remnant vegetation is treated as low-threat vegetation, provided it does not exceed 50m in fire run length or pose a substantial risk to surrounding structures. Consequently, the required APZ setbacks and construction standards for this vegetation are consistent with those for low-threat classifications, reducing bushfire risk while maintaining compliance with regulatory frameworks. This classification ensures that risk is appropriately managed without imposing unnecessary development constraints.

Photos of the predominant vegetation within the 140m assessable area are shown below in Figures 2-2 to 2-9.

2.3 Effective slope

The effective slope for the development site has been assessed up to 100m from the boundary, with variations observed across Stage 4. Effective slope, which refers to the slope exerting the greatest influence on fire behaviour, has been analysed in detail to ensure accurate assessment. In summary, Stage 4 displays consistent slopes of >0–5 degrees downslope.

2.4 Regional fire weather conditions

The study area assessment methodology relies on the application of the relevant fire weather conditions, referred to as the Fire Danger Index (FDI) or Grassland Fire Danger Index (GFDI) for grassland vegetation. For the Dungog area, which falls within the Greater Hunter Fire Weather District, the acceptable FFDI and GFDI values are set at 100 and 130, respectively as per *PBP*. For these given values, Table *A1.12.2* of *PBP* is used for the Hunter Region District in determining the relevant APZs.

Figure 2-2 – Vegetation photos (adjoining land)
(598 Gresford Road Vacy dated 17 August 2024)

Figure 2-3 – Vegetation photos (on-site)
(598 Gresford Road Vacy dated 17 August 2024)

Figure 2-4 – Vegetation photos (on-site)
(598 Gresford Road Vacy dated 17 August 2024)

Figure 2-5 – Vegetation photos (on-site)
(598 Gresford Road Vacy dated 17 August 2024)

Figure 2-6 – Vegetation photos (on-site)
(598 Gresford Road Vacy dated 17 August 2024)

Figure 2-7 – Vegetation photos (on-site)
(598 Gresford Road Vacy dated 17 August 2024)

Figure 2-8 – Vegetation photos (looking to nearby lands)
(598 Gresford Road Vacy dated 17 August 2024)

Figure 2-9 – Vegetation photos (adjoining forest)
(598 Gresford Road Vacy dated 17 August 2024)

2.5 Bushfire attack assessment

"A means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact. In the NCC, the BAL is used as the basis for establishing the requirements for construction to improve protection of building elements." (PBP 2019, page 110).

Table 2-1 provides a summary of the bushfire attack assessment based on a residential development and the methodologies used to determine APZs within *PBP*.

The APZs are required to be wholly within the site's boundaries and should not rely on being on adjoining land. APZs can extend beyond a site's boundaries in cases where structures or features of a landscape are considered permanent and act as barriers against fire spread. Examples are road carriageways, urban landscapes, or land with vegetation that is considered managed. The minimum APZ setback required for residential and rural subdivisions is a rating of BAL-29, which ensures buildings are not exposed to a radiant heat flux exceeding 29 kW/m^2.

The APZ requirements are identified within Table 2-1.

Table 2-1 – Bushfire attack assessment – Stage 4

Aspect	Vegetation formation within 140m of development (*PBP*)	Effective slope	APZ required	APZ provided	Comments
North (Lots 406-410)	Grasslands Dry Sclerophyll Forests (PCT 3433)	>0-5 ˚DS	12m (Grasslands) 29m (Dry Sclerophyll Forests)	12m (Grasslands) 29m (Dry Sclerophyll Forests)	The northern neighbours are dominated by grasslands, however, there are remnants of Dry Sclerophyll Forests and Planted Native Vegetation, which has been assessed as 'Forest'. An adequate minimum of 12m APZ from grasslands has applied generally. The minimum 29m APZ from Forests has also been applied to remnant pockets of this vegetation formation to highlight compliance.

Aspect	Vegetation formation within 140m of development (*PBP*)	Effective slope	APZ required	APZ provided	Comments
East (Lot 404-406) North (Lots 406-410)	Grasslands Forested Wetlands (PCT 4042) Isolated forest patches (remnants) in grassland	>0-5 ˚DS	12m (Grasslands) 12m (Forested Wetlands) 29m (Forest)	12m (Grasslands) 12m (Forested Wetlands) N/A	The prescribed minimum of 12m APZ from grasslands has been applied. Like the northern side, there are pockets of vegetation considered as 'Forested Wetlands', which have been included in the assessment to ensure compliance. Adequate APZ setbacks from Forested Wetlands have been identified (i.e. Lot 406). Note: there is sufficient space on each of these lots to apply the 29m APZs however it is not proposed to revegetate this section based on a suitable forest PCT.
West (Lots 401, 402, and 410)	Forest Grasslands	>0-5 ˚DS	29m (Forest) 12m (Grasslands)	70m building setback. 12m (Grasslands) 14m	The prescribed minimum APZ setback of 12m has been applied. This provides an adequate minimum APZ from grasslands. The strip of 'planted native vegetation' to the south has been assessed as 'Forest' remnant vegetation, requiring a 14m APZ. The south-western boundary seeks to maintain a 70m building setback from Gresford Road (i.e. Lot 401) in accordance with the DCP.

Aspect	Vegetation formation within 140m of development (*PBP*)	Effective slope	APZ required	APZ provided	Comments
South (Lot 404)	Grasslands Forested Wetlands (PCT 4042)	>0-5 ˚DS	12m (Grasslands) 12m (Forested Wetlands)	12m (Grasslands) 12m (Forested Wetlands)	The prescribed minimum 12m APZ from grasslands is applied. Like the northern and eastern side, there are pockets of vegetation formation considered as 'Forested Wetlands', which has been included in the assessment to ensure compliance. Adequate APZ setbacks from Forested Wetlands have been identified.

In summary, the development will have APZ setbacks which satisfy the minimum requirements to achieve a BAL-29 rating and ensure all future buildings will not be exposed to radiant heat levels exceeding 29kW/m^2. The 70m minimum building envelope setback prescribed by Dungog DCP 2019 create a constraint on Lot 401. As stated, this will be addressed in the SoEE.

All APZs have been appropriately assessed to ensure that a suitable building envelope is achievable on each lot. APZs are largely achieved through DCP provisions (typically 10m) plus an addition of 2m to the DCP setback to meet required APZs. The decision to rely on the 20m road reserves as part of the APZ strategy is also based on the spatial analysis of the site.

The 20m road reserves provide sufficient setbacks to meet APZ requirements under *PBP*, effectively acting as a low-fuel buffer between the development and surrounding vegetation. These roads enhance access for emergency services while ensuring compliance with bushfire safety standards. Given their strategic placement and dual purpose, the internal road is a practical and compliant solution that negates the need for additional APZs, provided ongoing maintenance is ensured to retain their effectiveness as low-fuel areas.

Areas of planted native vegetation and small forest remnants within grassland environments with significantly reduced fire threat, providing flexibility in APZ requirements.

3. SPECIFIC FIRE PROTECTION ISSUES

This section outlines the proposed package of bushfire protection measures and where possible assesses their compliance with the relevant performance criteria by comparison to the acceptable solutions for residential and rural subdivisions as per Chapter 5 of *PBP*.

3.1 Asset protection zones (APZs)

The intent of the measures is to provide sufficient space and maintain reduced loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact. In summary, the entire development site is to be managed as an inner-protection area as per *Appendix 4* of *PBP* and Schedule 2. This should be applied throughout the lifetime of the development and until each lot is sold/ developed and the hazard is removed.

Table 3.1 outlines the proposal's compliance with the performance criteria for APZs.

Table 3-1 – Standards for asset protection zones and landscaping (PBP)

Performance criteria: to provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact.		
Acceptable solution	***Complies***	***Comments***
APZs are provided in accordance with Tables A1.12.2 based on the FFDI.	☑	APZ setbacks include a minimum of 29m from forest vegetation and 12m for grasslands and forested wetlands, compliant with *PBP*.
APZs are managed in accordance with the requirements of Appendix 4.	☑	All APZs will be managed as inner protection areas, maintaining fuel loads as specified under Appendix 4 of *PBP*. On-site landscaping will need to be managed at future dwelling stages.
APZs are wholly within the boundaries of the development site	☑	Proposed APZs are wholly within property boundaries, with setbacks validated for compliance.
APZs are located on lands with a slope less than 18 degrees.	☑	All APZs are situated on compliant gradients, ensuring operational safety and bushfire resistance.
Landscaping is in accordance with Appendix 4; and	☑	Landscaping should align with inner protection area requirements. Further information is required at dwelling DA stages.
Fencing is constructed in accordance with section 7.6.	☑	Future fencing specifications should include non-combustible materials as required by *PBP* 2019. Rural boundary fencing comprising post and wire or post and rail is permissible.
Summary: The proposed asset protection zones for Stage 4 meet all performance criteria outlined in *PBP* 2019, ensuring the reduction of bushfire risk to below critical thresholds for future dwellings. All setbacks and APZ management strategies are in full compliance with acceptable solutions.		

3.2 Construction standards

The building construction standards of future dwellings within the development site that will be situated on BFPL and within 100m of bushland or 50m of grassland are to be applied following *AS3959 Construction of buildings in bushfire prone areas (2018)* or NASH Standard and Section 5 of *PBP*. Future residential buildings will be able to comply with BAL 29 or lower setbacks.

3.3 Access

The access measures intend to provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

Table 3-2 – Standards for access (General) within Residential and Rural-Residential Subdivisions (PBP)

Performance criteria: Firefighting vehicles are provided with safe, all-weather access to structures		
Acceptable solution	***Complies***	***Comments***
Property access roads are two-wheel drive, all-weather roads;	☑	Proposed designs include sealed, all-weather roads accessible by firefighting vehicles.
Perimeter roads are provided for residential subdivisions of three or more allotments;	☑	All internal roads align with subdivision designs and provide adequate firefighting access. Perimeter roads are not required for rural-residential subdivisions including R5 zones.
Subdivisions of three or more allotments have more than one access in and out of the development;	☒	Deviates: Stage 4 has 10 lots and one access in and out of the development. Stage 4 is in zone R5 and passes through a managed grassland, not forest, woodland or heath. As all lots will be managed as IPAs and not behave as bushfire prone land, the need for alternate access is not required.
Traffic management devices are constructed to not prohibit access by emergency services vehicles;	☑	Traffic management plan should include features that avoid obstructions for emergency vehicles. Condition of consent.
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;	☑	Road gradients comply with both maximum and average slope criteria, ensuring safe access for firefighting vehicles.
All roads are through roads;	☒	Deviates. A dead-end road is used for Stage 4. However, turning circles with a minimum 12m radius have been included as per *PBP*. (See below re alternative approach). As all lots will be managed as IPAs and not behave as bushfire prone land, the need for through road access is not required.
Dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end:	☒	Deviates. The dead-end road in Stage 4 exceeds the 200m maximum length. The road incorporates a minimum 12m outer radius turning circle.

Performance criteria: Firefighting vehicles are provided with safe, all-weather access to structures		
		Given that this is a rural-residential, low-density area, and lots will be converted from grassland to be managed to an Inner Protection Area (IPA), firefighting vehicles can be provided with safe, all-weather access to structures. It is noted that this is the end of the development footprint in terms of zoning. Signage placement is subject to the condition of consent requirement. (See Figure 3-1).
Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road;	☑	Kerb designs should incorporate roll-top kerbing on all sides of the road to facilitate emergency vehicle access.
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	☑	Complies. Stage 4 does not travel through forest, woodland or heath although some vegetation in the C3 zone may apply on one side.
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	☑	Complies. Road widths meet *PBP* standards, ensuring operational access for emergency vehicles. Reticulated water not proposed – dedicated water on-site subject to siting of buildings.

Summary: The proposed access infrastructure demonstrates compliance with several key standards; however, there are notable deviations that must be considered to fully meet the performance criteria for providing safe, all-weather access for firefighting vehicles:

- The dead-end road in Stage 4 exceeds the 200m maximum length; however, it incorporates a compliant 12m outer radius turning circle to facilitate vehicle manoeuvrability. (see Figure 3-1). Given the rural-residential, low-density nature of the area and the planned conversion of lots from grassland to managed Inner Protection Areas (IPA), safe, all-weather access for firefighting vehicles to structures can be provided.
- Signage placement will need to be addressed as a condition of consent.

Considerations:

- Rural boundary fencing should be non-combustible or post and wire/post and rail configuration.
- Ensure signage for all dead-end roads to meet *PBP*.
- Validate traffic management and kerb design compliance prior to finalizing.
- All lots to be managed as IPAs.

Table 3-3 – Standards for Perimeter Roads within Residential Subdivisions (PBP)

Performance criteria: vehicle access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interfaces are provided with safe, all-weather access to structures.
Summary: The proposed development is for rural-residential development and perimeter roads are not required under *PBP*. The internal road design is not for a perimeter road however the internal road design demonstrates overall compliance with the *PBP* performance criteria. The Stage 4 design is for a low-density, rural-residential setting, and the proposed lots will be converted from grassland to managed Inner Protection Areas (IPA). This managed land reduces the bushfire hazard and ensures safer conditions for firefighting operations. **Considerations:** • Perimeter roads are not proposed being a rural-residential development (see Table 3-2 above). • Non-perimeter road requirements are set out in Table 3-4 below. • The nature of the development is to remove grassland hazards and have sites managed as IPAs.

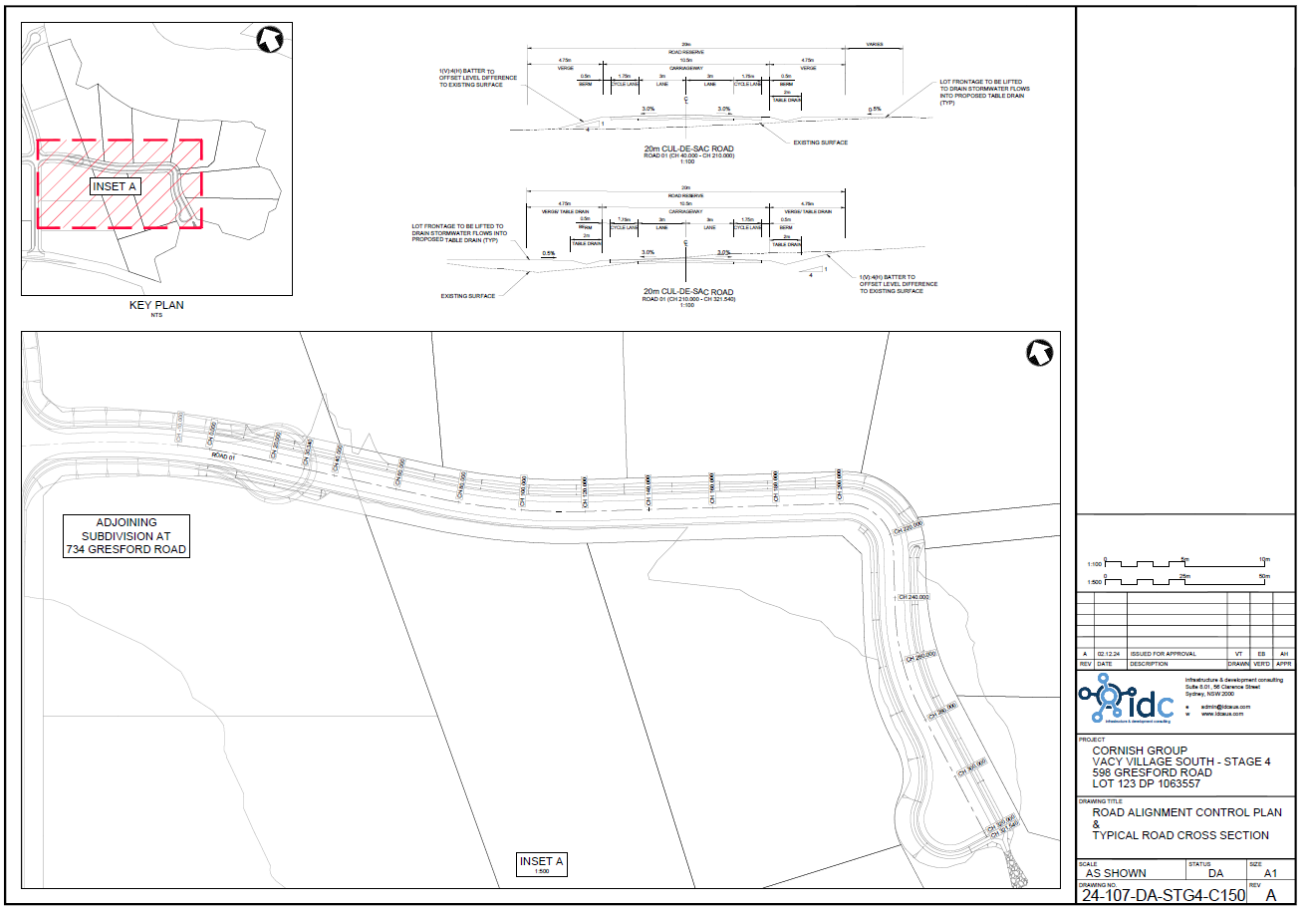


Figure 3-1 – Typical Road Cross Section – Vacy Village South – 598 Gresford Rd, Vacy
(Cornish Group, Rev. A, dated 2.12.2024)

Table 3-4 – Standards for Non-Perimeter Roads within Residential Subdivisions (PBP)

Performance criteria: Firefighting vehicles are provided with safe, all-weather access to structures		
Acceptable solution	***Complies***	***Comments***
Minimum 5.5m carriageway width kerb to kerb	☑	All non-perimeter roads are 8m and meet the minimum carriageway width of 5.5m, ensuring accessibility for firefighting vehicles.
Parking is provided outside of the carriageway width;	☑	There are no designated parking spaces within proposed design, however there is adequate space on-site of each lot.
Hydrants are located clear of parking areas;	N/A	Reticulated water is not provided. Each lot will have 20,000 litres of dedicated static water for firefighting.
Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m;	☒	Deviates. The internal road network includes roads linked at compliant intervals, facilitating efficient movement for emergency vehicles. Stage 4 does not have a through road.
Curves of roads have a minimum inner radius of 6m;	☑	Road curves meet the required 6m inner radius, allowing smooth navigation for firefighting equipment.
The road crossfall does not exceed 3 degrees;	☑	All crossfalls are within the permissible 3-degree limit, ensuring stability for vehicles, particularly during emergency operations.
A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	☑	Adequate vertical clearance has been ensured, with no obstructions below 4m, facilitating the passage of firefighting vehicles and larger apparatus.

Summary: The proposed non-perimeter roads largely comply with the performance criteria for providing safe, all-weather access to structures; however, there are some areas requiring additional clarification and potential improvement:

- While there are no designated parking spaces in the current design, the spacing on-site for parking of each Lot is sufficient.
- The positioning of dedicated water supplies relative to parking areas needs further clarification at dwelling DA stage. Water tanks are to be well placed clear of any potential obstructions is critical to maintaining accessibility for emergency services. Additional detail of site is required to confirm compliance at dwelling DA stage.
- The Stage 4 design fails to provide through roads, which deviates from *PBP*. However, as stated, the area is a low-density, rural-residential setting, and the proposed lots will be converted from grassland to managed Inner Protection Areas (IPA). This managed land reduces the bushfire hazard and ensures safer conditions for firefighting operations.

Considerations:

- Clearly identify and designate parking spaces on-site at dwelling DA stage to prevent encroachment on firefighting access routes.

Table 3-5 – Standards for Property Access within Residential Subdivisions (PBP)

Performance criteria: Firefighting vehicles can access the dwelling and exit the property safely		
Acceptable solution	***Complies***	***Comments***
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.	☑	Complies. Rural-residential subdivision. The layout complies with urban access requirements, with no unobstructed paths exceeding 70m to the public road system. Access within the site should not present any challenges due to lot size but will be subject of dwelling approvals.
Summary: The proposed property access design meets the performance criteria outlined in *PBP*, Table 5.3d notwithstanding the development is for rural-residential subdivision. The design ensures unobstructed access paths for firefighting vehicles, adequate clearance and turning areas, and compliant road grades and widths. Passing bays and road curves have been appropriately designed for rural sections.		

3.4 Services

3.4.1 Water supplies

The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of bushfire. Table 3-6 outlines the proposal's compliance with the acceptable solutions for reticulated water supply.

Table 3-6 – Standards for reticulated water supplies (PBP)

Performance criteria: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building		
Acceptable solution	***Complies***	***Comments***
Reticulated water is to be provided to the development where available;	N/A	No reticulated water is proposed.
A static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed	☑	For non-reticulated developments, Stage 4 must comply with Table 5.3d of *PBP*, Chapter 5. Specifically, it must comply with 'Rural-residential lots' (>10,000m²) for a water requirement of 20,000L/lot. Can be a condition of consent and restriction ion title. (Note some lots less than 10,000m^2 but higher water is still recommended).
Static water supplies shall comply with Table 5.3d.	☑	Can comply. Static water is required, confirm tank capacities, and compliance with distance standards before dwelling approval. Can be a restriction to the title.
Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005	N/A	Not applicable.
Hydrants are not located within any road carriageway	N/A	Not applicable.

Performance criteria: to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building		
Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	N/A	Not an urban subdivision. No reticulated water proposed. Ensure static systems comply.
Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.	N/A	No reticulated water proposed.
All above-ground water service pipes are metal, including and up to any taps; and	☑	Can be a condition of consent for dwelling DA.
Above-ground water storage tanks shall be of concrete or metal.	☑	Can be a condition of consent for dwelling DA.

Summary:

- No reticulated water supply is proposed. The subdivisions must plan for dedicated on-site static water supply systems compliant with Table 5.3d of *PBP*, including a minimum water requirement of 20,000L per rural residential lot. This could be subject to a restriction to title.
- Static water supplies need to comply fully with *PBP* standards. This includes verification of tank capacities, placement, and operational fittings.
- Metal pipes and tanks are proposed but require further verification to ensure compliance.

Considerations

- The design to include static water systems that meet the specified volume and standards under *PBP* Table 5.3d.
- Conduct a detailed review of hydrant placement to confirm compliance with AS 2419.1:2005 and ensure hydrants are clear of road carriageways.
- Confirm and document that all above-ground water service pipes and tanks are constructed with fire-resistant materials, such as metal or concrete.
- Imposition of a restriction on title to ensure *PBP* requirements are met.

3.4.2 Gas

The intent of measures is to locate gas so as not to contribute to the risk of fire to a building. Table 3-7 outlines the required acceptable solutions for gas supply.

Table 3-7 – Performance criteria for gas supplies (PBP guidelines)

Performance criteria: location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.		
Acceptable solution	***Complies***	***Comments***
Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - *The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used*	N/A	Is not proposed. Possible consideration at dwelling DA stage.
All fixed gas cylinders are kept clear of all flammable materials to 10m and shielded on the hazard side	N/A	Is not proposed. Possible consideration at dwelling DA stage.
Connections to and from gas cylinders are metal;	N/A	Is not proposed. Possible consideration at dwelling DA stage.

Performance criteria: location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.		
Polymer-sheathed flexible gas supply lines are not used; and	N/A	Is not proposed. Possible consideration at dwelling DA stage.
Above-ground gas service pipes are metal, including and up to any outlets.	N/A	Is not proposed. Possible consideration at dwelling DA stage.

Summary: No gas utilities proposed. Bottled gas (cylinders) is not supported or recommended and should be a restriction on title other than small bottles for BBQs.

Considerations:

- If any future gas utilities proposed, conduct an on-site inspection to validate compliance with the acceptable solutions.

3.4.3 Electricity

The intent of measures is to locate electricity so as not to contribute to the risk of fire to a building. Table 3-8 outlines the required acceptable solutions for the development's electricity supply.

Table 3-8 – Standards for electricity services (PBP)

Performance criteria: location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.		
Acceptable solution	*Complies*	*Comments*
Where practicable, electrical transmission lines are underground;	☒	Based on surrounding Vacy area and proposed design, no proposed electrical transmission lines are underground as it is not reasonable.
Where overhead, electrical transmission lines are proposed as follows: • lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas. • no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines.	☑	Overhead transmission lines likely apply based on surrounding Vacy area context. Compliance with pole spacing needs further verification. Vegetation clearance near power lines requires site-specific verification, particularly for areas adjacent to bushland.

Summary: The compliance of electricity services for the proposed subdivision cannot be fully determined without additional details specific to the site. The Vacy area generally relies on overhead transmission lines, which increases the risk of ignition if not properly managed.

- Underground transmission lines would reduce ignition risks but are unlikely to be feasible in this context. Confirmation is required on whether overhead lines are planned.
- If overhead lines are used, compliance with pole spacing (30m) and vegetation clearance under ISSC3 guidelines must be ensured. These factors are critical to minimize bushfire risks.

Considerations:

- Confirm the proposed method for electrical service installation (underground or overhead).
- For overhead lines, validate compliance with ISSC3 vegetation clearance standards and pole spacing requirements.

3.5 Specific objectives for residential and rural-residential subdivisions

The specific objectives for residential and rural subdivisions with a dwelling entitlement are as follows:

Table 3-9 – Specific objectives (Residential and rural-residential subdivisions)

Specific objective	Compliance	Comment
Minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided);	☑	Complies. (Refer to the discussion in section 2.5 and 3.3).
Minimise vegetated corridors that permit the passage of bush fire toward buildings	☑	Complies. (Refer to the discussion in section 2.5 and 3.3).
Provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests	☑	Complies. The development site is not situated on or near to ridge-tops and steep slopes, within saddles and narrow ridge crests.
Ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms	☑	Complies. All APZs can achieve BAL 29. (Refer to the discussion in sections 2.3 and 3.1).
Ensure the ongoing maintenance of APZs	☑	Complies. Future maintenance to be implemented and compliance with future Vegetation Management Plan.
Provide adequate access from all properties to the wider road network for residents and emergency services	☑	Complies. (Refer to the discussion in section 3.4.1).
Provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression; and	☑	Complies – however see alternative approach. Property maintenance allows access on site, subject to future DA considerations for dwellings. (Refer to the discussion in section 3.3).
Ensure the provision of an adequate supply of water and other services to facilitate effective firefighting	☑	Complies. (Refer to the discussion in section 3.4).

4. CONCLUSION & RECOMMENDATIONS

4.1 Conclusion

This bushfire protection assessment has been undertaken for the proposed future rural-residential subdivision at 598 Gresford Road, Vacy. In total, there will be 10 rural residential lots in the north (Stage 4). The proposed subdivision is mapped as being bush fire prone land and is subject to the considerations under s100B of the Rural Fires Act and will require a bush fire safety authority from the RFS.

In summary, the assessment highlighted the following:

1. **Stage 4 (Northern Lot):** The building envelope constrains Lot 401. It is acknowledged that this will be addressed in SoEE. The reliance on a single entry and exit point generally increases risks during emergencies, however, no access is traversing through forest, woodland, or heath.
2. **Perimeter Roads as APZs:** The proposed 20m perimeter road reserves provide sufficient internal APZ setbacks. Boundary APZs are achievable and should be established on-site through a s88B Restriction on Title. Stage 4 lacks the continuous perimeter required for residential developments but meet rural-residential requirements. Dead-end roads proposed deviate from *PBP*. This has been justified, given the performance criteria can be demonstrated through the low-density, rural-residential setting and the area is to be managed as an IPA.

In recognition of the requirements of *PBP* and the potential bushfire risk posed to the development site by grasslands and nearby bushland; *TBE* proposes the following combination of bushfire measures:

- APZ setbacks are required the minimum setbacks for BAL-29 and in accordance with the minimum setbacks outlined with *PBP* for most aspects as shown in Table 2-2 and generally depicted in Schedule 1.
- The dead-end road in Stage 4 exceeds the 200m maximum length; however, it incorporates a compliant 12m outer radius turning circle to ensure safe manoeuvrability for firefighting vehicles. Given the rural-residential, low-density nature of the site and the planned conversion of lots from grassland to managed IPA, the bushfire hazard will be significantly reduced, and all-weather access to structures will be provided. This design minimises the need for extensive travel into the site by emergency services, supporting safe operations while aligning with the intent of the *PBP* performance criteria. Signage placement indicating the dead-end should be addressed as a condition of consent.
- If any future gas and water utilities proposed must be implemented in accordance with *PBP*. Gas is not supported and should be a restriction to title for bottled gas other than small cylinders for BBQs.
- Future dwelling construction in compliance with *PBP* and the appropriate construction sections of *AS3959-2018 (or NASH) and PBP*.
- Fencing should be post and rail or post and wire rural fencing.

The following specific recommendations are provided to ensure that the development is in accordance with, or greater than, the requirements of *PBP.*

4.2 Recommendations

Recommendation 1 – The development including APZs is as generally indicated on the attached Schedule 1- Plan of Bushfire Protection Measures and in Table 2-1 of this report. Future dwellings must be constructed to achieve BAL-29 compliance (AS 3959:2018) where APZs meet the prescribed setbacks for Grasslands, Forested Wetlands, and Dry Sclerophyll Forests.

Recommendation 2 – Dead-end roads are illustrated in Stage 4. However, given the rural-residential, low-density nature of the site and the planned conversion of lots from grassland to become a managed Inner Protection Area (IPA), the bushfire hazard will be minimised, justifying meeting the performance criteria (see Section 3.3).

Recommendation 3 – Street landscaping to be managed in accordance with *Appendix 4* of *PBP* and as shown in Schedule 2- Management of Assessment Protection Zones.

Recommendation 4 – Incorporate dedicated static water supply systems meeting *PBP* provisions (20,000L static water tanks per lot for rural-residential developments) for each lot at dwelling DA stage as a restriction to title. Tanks must include compatible fittings and accessible clear zones for firefighting vehicles and above-ground water pipes must be constructed from non-combustible materials (metal).

Recommendation 5 – Electrical reticulation is proposed and must be in accordance with *PBP* provisions. Implement a restriction on title to prevent the use of bottled gas connections to houses. Small, bottled gas is permissible for BBQs.

Recommendation 6 – Ensure ongoing on-site vegetation management to retain APZ functionality, particularly on steeper slopes (e.g. southern and eastern aspects).

Recommendation 7 – Vegetation within the site boundary must be maintained, consistent with Schedule 2, in accordance with Appendix 4 of *PBP*. Proposed restoration works south of Lot 401 should be maintained and managed in perpetuity.

5. INFORMATION SOURCES

5.1 Information collation

1) Aboriginal Heritage Management Information System (AHIMS).
2) IDC, "*Road Alignment Control Plan & Typical Road Cross Section*," Cornish Group Vacy Village South – Stage 4 598 Gresford Road Lot 123 DP 1063557, REF: 24-107-DA-STG4-C150, Rev A, dated 2/12/2024.
3) Premise. *"STAGE 4 - NORTH VILLAGE PLAN OF PROPOSED SUBDIVISION OF LOT 123 DP 1063557, VACY", P000385_03,* rev. B, dated: 28/05/2024.
4) WARREN RAYMOND SAUNDERS, PLAN OF SUBDIVISION OF LOT 123 IN DP 1063557, Reference: P000385. 05C.DP, October 2024
5) *Dungog Local Environmental Plan 2023 (Dungog LEP) and Dungog Development Control Plan 2019 (Dungog DCP)*
6) NSW Planning Portal.
7) NSW SEED Portal.
8) *Rural Fires Act 1997 (RF Act).*

5.2 Bibliography

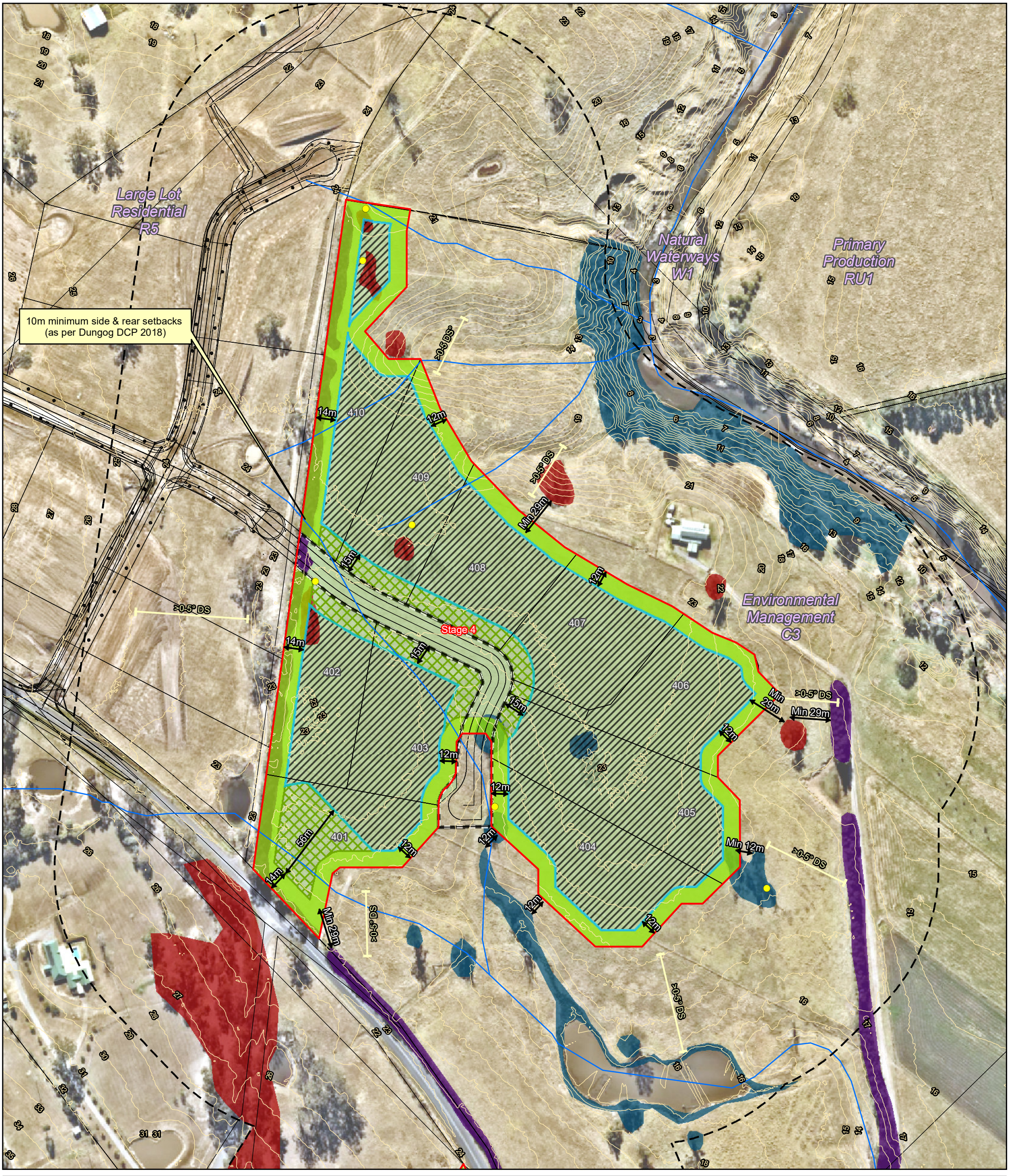
Australian Building Codes Board (2022), Building Code of Australia: Volume 1 Class 2-9 Buildings Provisions. National Construction Code. Canberra.

Keith, David (2004), Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT. The Department of Environment and Climate Change. Sydney

Rural Fire Service (2019), Planning for Bush Fire Protection – A guide for councils, planners, fire authorities and developers. NSW Rural Fire Service. Sydney.

Standards Australia (2018), AS3959: 2018 - Australian Standard - Construction of buildings in bush fire-prone areas. Sydney.

SCHEDULE 1. PLAN OF BUSHFIRE PROTECTION MEASURES



Legend

- Study area (source:CAD)
- 140m assessment area
- Gullies/depressions
- Contour 1 m (Source: LiDAR)
- Habitat tree
- Buffer line

Proposed

- Buildable area
- Minimum 8m proposed perimeter roads
- Minimum building envelope setbacks (Dungog DCP)
- Minimum APZ required (<29kW/m2/IPA)

Vegetation Formation

- Wet Sclerophyll Forests
- Dry Sclerophyll Forest (Shrubby sub-formation)
- Dry Sclerophyll Forest (Grassy sub-formation)
- Grasslands
- Forested Wetlands
- Planted native vegetation (Remnant Vegetation, PBP)

Aerial source: Nearmap

TRAVERS BUSHFIRE & ECOLOGY
A TBE ENVIRONMENTAL COMPANY

PROJECT & MXD REFERENCE
Stage 4 - 598 Gesford Rd, Vacy
CORN06_BF001_Stg4

DATE & ISSUE NUMBER
7/02/2025
Issue 1
SC

SCALE & COORDINATE SYSTEM
1:2,500 @ A3
GDA2020 MGA Zone 56

0 50 100 m

TITLE

Schedule 1- Bushfire Protection Measures (Stage 4)

Document Path: N:\GIS STORAGE\N Drive\1_GDA2020_MappingProjects\CORN06_598GresfordRd\MXDs\CORN06_BF001_Stg4.mxd

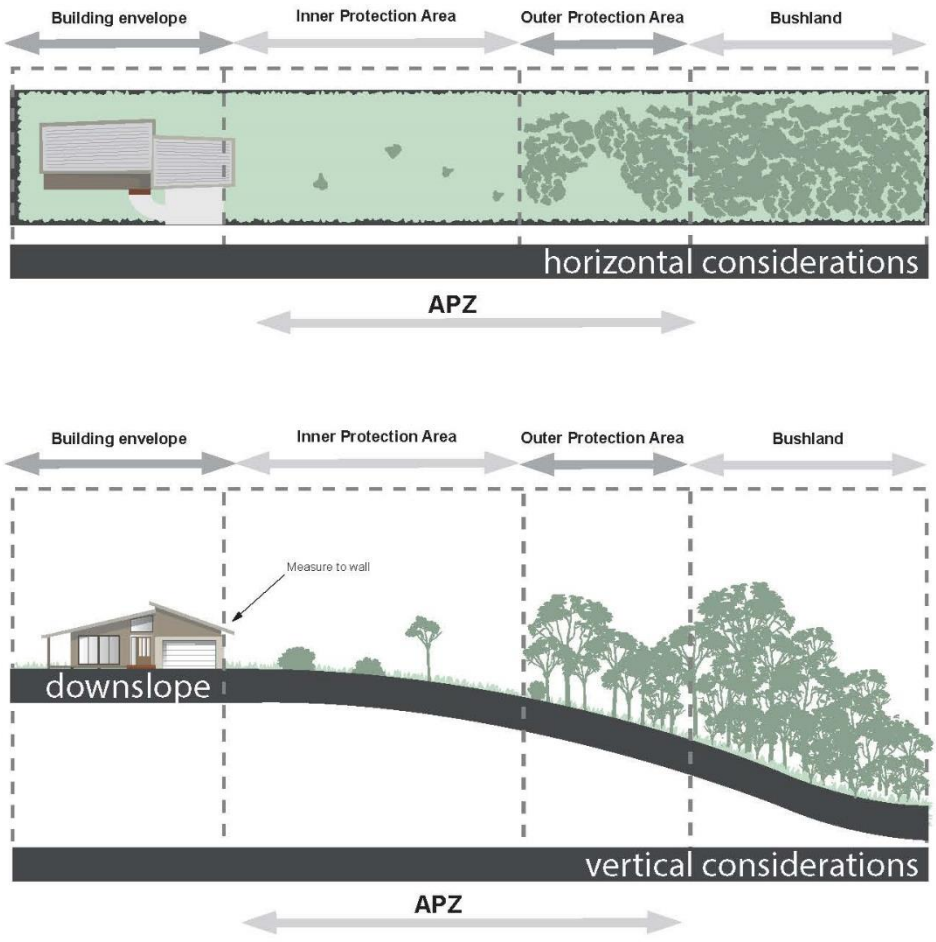
Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

SCHEDULE 2. MANAGEMENT OF ASSET PROTECTION ZONES

The RFS provides basic advice in respect of managing APZs through documents such as, *Standards for Asset Protection Zones* (RFS, 2005), with landscaping to comply with Appendix 4 of *PBP*.

In forest vegetation an APZ may consist of two subordinate areas, an inner protection area (IPA) and an outer protection area (OPA). The IPA is the area immediately surrounding the building and the OPA (up to 30% of the total APZ width) is between the IPA and the hazard.

A typical APZ is graphically represented below.



APZs and progressive reduction in fuel loads
(Source: PBP, 2019)

Note: Vegetation management as shown is for illustrative purposes only. Specific advice is to be sought regarding vegetation removal and retention from a qualified and experienced expert to ensure APZs comply with the RFS performance criteria.

The following table adapted from *PBP* provides maintenance advice for vegetation within the IPA and OPA. The APZ is to be maintained in perpetuity and maintenance should be undertaken regularly, particularly in advance of the bushfire season.

	Inner Protection Area	Outer Protection Area
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 retaining smooth barked and evergreen trees.	➢ Tree canopy cover should be **less than 30%;** and ➢ Canopies should be separated by **2 to 5m**.
Shrubs	➢ Large discontinuities or gaps in the vegetation should be provided to slow down or break the progress of fire towards buildings. ➢ Shrubs should not be located under trees. ➢ Shrubs should form **less 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.	➢ Shrubs should not form a continuous canopy; and ➢ Shrubs should **form less than 20%** of ground cover.
Grass and Leaf Litter	➢ Grass should be kept mown to a height of **less than 100mm**; and ➢ Leaves and other debris should be removed	➢ Grass should be kept mown to a height of **less than 100mm**; and ➢ Leaf and other debris should be removed.
	All Management Zones	
Weeds	➢ All weeds should be removed in accordance with best practice guidelines, and measures taken to prevent their further spread	
Landscaping	➢ Suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways. ➢ Restrict planting in the immediate vicinity of the building which may over time and if not properly maintained come into contact with the building. ➢ When considering landscape species consideration needs to be given to estimated size of the plant at maturity. ➢ Avoid species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopies. ➢ Use smooth bark species of trees species which generally do not carry a fire up the bark into the crown. ➢ Avoid planting of deciduous species that may increase fuel at surface / ground level (i.e. leaf litter). ➢ Avoid climbing species to walls and pergolas. ➢ Locate combustible materials such as woodchips / mulch, flammable fuel stores away from the building. ➢ Locate combustible structures such as garden sheds, pergolas and materials such timber garden furniture way from the building; and ➢ Use of low flammability vegetation species.	