

Bush Fire Assessment Report

Planning Proposal

Glenmore Park East

Reference Number: 240152

Prepared For:
Nergl Developments Pty Ltd

14 September 2023



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Contents

	<u>Page No.</u>
Copyright and Disclosure	2
List of Abbreviations	3
Executive Summary	4 - 6
1.0 Introduction	7
2.0 Purpose of Report	8
3.0 Scope of Report	8
4.0 Aerial Image, BPLM, Zoning, Structure Plan & Master Plan	8 - 11
5.0 Bushfire Assessment	12 - 31
6.0 Conclusion	32
7.0 Annexure	33
- List of referenced documents and attachments	
- Attachments	

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Version Control				
Version	Date	Author	Reviewed	Details
1	13/09/2023	Stuart McMonnies	Ian Tyerman	Draft Report
2	14/09/2023	Stuart McMonnies		Final Report

List of Abbreviations:

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 'Construction of buildings in bushfire-prone areas' – 2018
BAL	Bushfire Attack Level
BPMs	Bushfire Protection Measures
BPLM	Bush Fire Prone Land Map
Council	Penrith City Council
DA	Development Application
EP&A Act	Environmental Planning and Assessment Act - 1979
FRNSW	Fire & Rescue NSW
IPA	Inner Protection Area
NCC	National Construction Code
NP	National Park
NSP	Neighbourhood Safer Places
OPA	Outer Protection Area
PBP	Planning for Bush Fire Protection – 2019
ROW	Right of Way
RF Act	Rural Fires Act - 1997
RFS	NSW Rural Fire Service
SBFS	Strategic Bush Fire Study
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SWS	Static Water Supply

Executive Summary

Building Code and Bushfire Hazard Solutions P/L has been commissioned by Nergl Developments Pty Ltd to prepare an independent Bushfire Assessment Report for a Planning Proposal which will facilitate a future development at 2013 - 2113 The Northern Road and 1 - 29 Bradley Street, Glenmore Park.

The Planning Proposal (PP) seeks to rezone a 47.95-hectare (ha) parcel of land bounded by the recently upgraded The Northern Road to the east, Glenmore Parkway to the north, Bradley Street to the south and the existing Glenmore Park neighbourhood to the west. The precinct is within the Penrith Local Government Area (LGA) and the land subject to this PP is described as **Glenmore Park East**.

The precinct is located 10km to the north of the new 24-hour Western Sydney International Airport and 5km south of the Penrith CBD and is centrally located within the Western Parkland City. The precinct is surrounded by the existing stages of the Glenmore Park Estate (stages 1-3), Penrith Golf Course to the north, the state led Orchard Hills master planned precinct to the east and the Defence Establishment Orchard Hills to the southeast. The precinct is approximately 1km south of the M4 freeway and approximately 5km west of the new Orchard Hills Metro Station which is currently under construction.

The proponent applied to the Department of Planning and Environment in January 2023 for the PP to be considered under the pilot State Assessed Planning Proposal (SAPP) program. From more than 100 applications across NSW, DPE selected this precinct as one of five (5) to be assessed through the SAPP pilot program. In being selected for this pilot program, DPE was satisfied that the proposal:

- demonstrated public benefit through housing supply and alignment with state policies and land use strategies
- contributed to affordable and social housing outcomes
- offered a pathway to the delivery of housing in the short term
- has adequate infrastructure available or that funding is committed for critical infrastructure

Whilst there has been differing views over the last 20 years about how the precinct should be developed, the growth and evolution of the Western Parkland City confirms that the precinct is a logical urban inclusion in the *Penrith Local Environmental Plan 2010* (PLEP 2010) whilst being a contemporary gateway to the Penrith LGA.

The precinct is currently zoned C4 Environmental Living (44.93 hectares), R2 Low Density Residential (225 square meters), SP2 Infrastructure (113 square meters) and RE1 Public Recreation (2.98 hectares) under the PLEP 2010. Land within the precinct is currently utilised for rural residential lifestyle properties, with part of the precinct having been approved for a 17-lot rural residential subdivision in 2005.

The proposed Master Plan provides for approximately 1,710 new homes, offering a diverse range of housing options to meet the needs of a changing community. These new homes include approximately 242 traditional detached homes (with an average site area of 320 square meters), 182 smaller attached terraces (with an average site area of 240 square meters), and 1,286 (1, 2 and 3 bedroom) apartments (with an average size of 90 square meters).

Furthermore, the proposed Master Plan accommodates a range of non-residential uses in the precinct, including mixed-use retail spaces, childcare facilities, medical services, food and beverage establishments, a fresh food market, specialty shops, restaurants and cafes, entertainment venues, offices, and a hotel for short-term accommodation supporting visitors and the requirements of nearby defence industry partners. This diverse range of services and amenities aims to meet the needs of both residents and visitors to the precinct.

The precinct will also feature 14.425ha of public open space (including bushland and riparian corridors), 1.02ha of communal open space and 2.935ha of avoided land¹ which is to be partly utilised for flooding, drainage and landscape purposes. In all, these areas total 18.38ha which represents more than 38.3% of the site. The location of parks and open space areas has been thoughtfully chosen to enhance the existing natural landscape, such as hilltops and creek lines, and to preserve significant bushland areas, providing the highest level of amenity for future residents. Additionally, the precinct proposes significant open space embellishments including a commitment to the provision of a public swimming pool, two (2) public tennis courts and high-end play facilities.

Having regard to the proposed Master Plan detailed above, the PP seeks to change the areas zoned C4 Environmental Living and SP2 Infrastructure to a combination of the following zones:

- R2 – Low Density Residential
- R3 – Medium Density Residential
- MU1 – Mixed Use
- E1 – Local Centre
- SP2 - Infrastructure
- RE1 – Public Recreation
- C2 – Environmental Conservation

The subject site is depicted on Penrith City Council's Bushfire Prone Land Map as containing Category 2 Vegetation and the Vegetation Buffer and is therefore considered 'bushfire prone land'.

In relation to this planning proposal Penrith City Council is required to apply section 9.1(2) of the *Environmental Planning and Assessment Act 1979*. Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for proposals that affect or are in proximity to land mapped as bushfire prone. Under these directions the following objectives apply:

- i. to protect life, property and the environment from bush fire, by discouraging the establishment of incompatible land uses in bush fire prone areas; and*
- ii. to encourage sound management of bush fire prone areas.*

A Strategic Bush Fire Study has been undertaken and concluded the proposal is appropriate in the bushfire hazard context.

A key consideration for planning proposals in bushfire prone areas is limiting or excluding incompatible development commensurate with the level of risk. In this regard the subject site is considered to have a low bushfire risk when considering the characteristics of the vegetation.

In addition to the Strategic Bush Fire Study an assessment of the proposed land zoning against the specific Bushfire Protection Measures of PBP has concluded that future Development Applications have the capacity to satisfy this document.

¹ As identified and defined in the Cumberland Plain Conservation Plan

It is of our opinion that the proposal provides an appropriate combination of Bushfire Protection Measures (BPMs) in accordance with *Planning for Bush Fire Protection 2019*.

Furthermore we are satisfied that the proposed Master Plan, in combination with the bushfire protection measures discussed herein will not result in areas that are difficult to evacuate, create control difficulties during a bushfire or adversely affect other bush fire protection strategies or place existing development at increased risk.

1.0 Introduction

Building Code and Bushfire Hazard Solutions P/L has been commissioned by Nergl Developments Pty Ltd to prepare an independent Bushfire Assessment Report for a Planning Proposal which will facilitate a future development at 2013 - 2113 The Northern Road and 1 - 29 Bradley Street, Glenmore Park.

The proposed Master Plan provides for approximately 1,710 new homes, offering a diverse range of housing options to meet the needs of a changing community. These new homes include approximately 242 traditional detached homes (with an average site area of 320 square meters), 182 smaller attached terraces (with an average site area of 240 square meters), and 1,286 (1, 2 and 3 bedroom) apartments (with an average size of 90 square meters).

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- i. to protect life, property and the environment from bush fire, by discouraging the establishment of incompatible land uses in bush fire prone areas; and*
- ii. to encourage sound management of bush fire prone areas.*

The proposal must demonstrate compliance with the s9.1(2) Directions and the relevant specifications and requirements of *Planning for Bush Fire Protection 2019* (PBP).

The application of PBP requires satisfactory demonstration of the aim and objectives and the specific objectives and bushfire protection measures relevant to the type of development.

In this instance the proposal relates to a Planning Proposal to facilitate a future residential and mixed use development and therefore in addition to the aim and objectives detailed in Chapter 1 'Introduction' the proposal must satisfy Chapter 4 'Strategic Planning' of PBP.

The bushfire protection measures detailed in Chapter 5 'Residential and Rural Residential Subdivisions', Chapter 6 'Special Fire Protection Purpose Development' and Chapter 8 'Other Development' of PBP have also been considered for the future applications.

2.0 Purpose of Report

The purpose of this Bushfire Assessment Report is to provide an independent bushfire assessment together with appropriate recommendations for bushfire mitigation measures considered necessary having regard to development within a designated 'bushfire prone' area.

This Bushfire Assessment Report addresses Section 4 'Strategic Planning' of *Planning for Bush Fire Protection 2019*.

3.0 Scope of this Report

The scope of this report is limited to providing a bushfire assessment and recommendations for the subject site (refer to Figure 01). Where reference has been made to the surrounding lands, this report does not purport to directly assess those lands; rather it may discuss bushfire impact and/or progression through those lands and possible bushfire impact to the subject site.

4.0 Aerial Image, BPLM, Zoning, Structure Plan & Master Plan

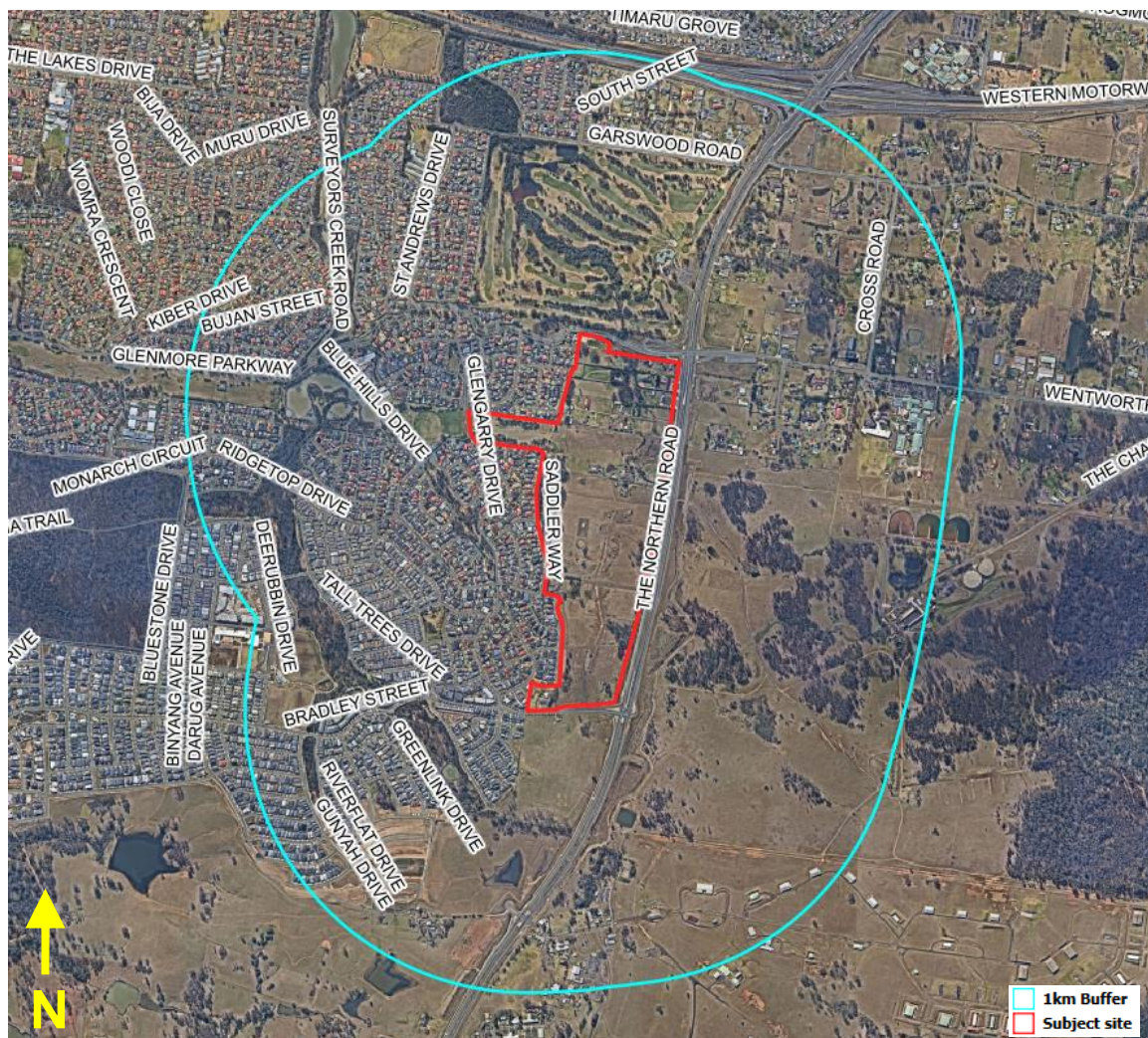


Figure 01: Aerial view of the subject area

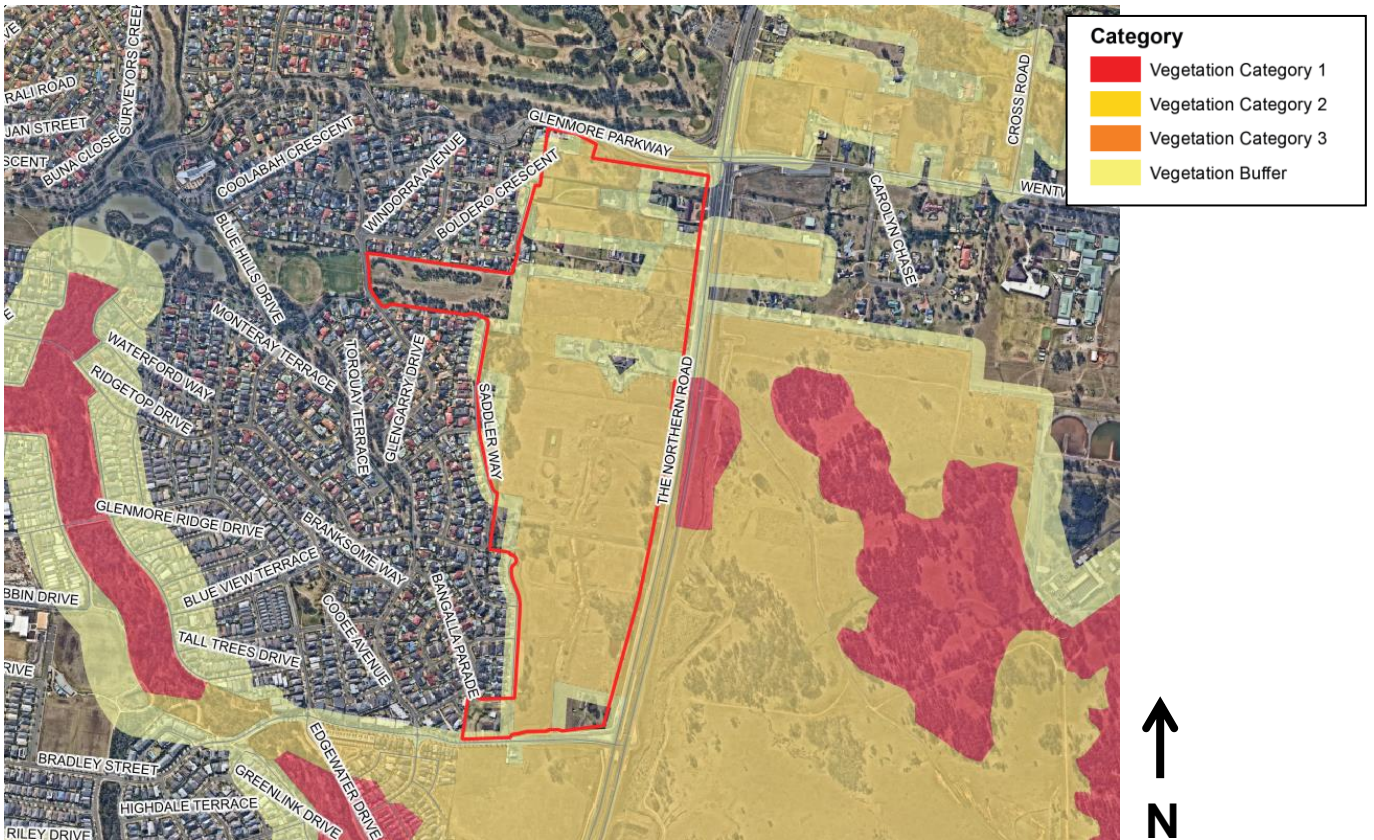


Figure 02: Extract from Penrith City Council's Bushfire Prone Land Map

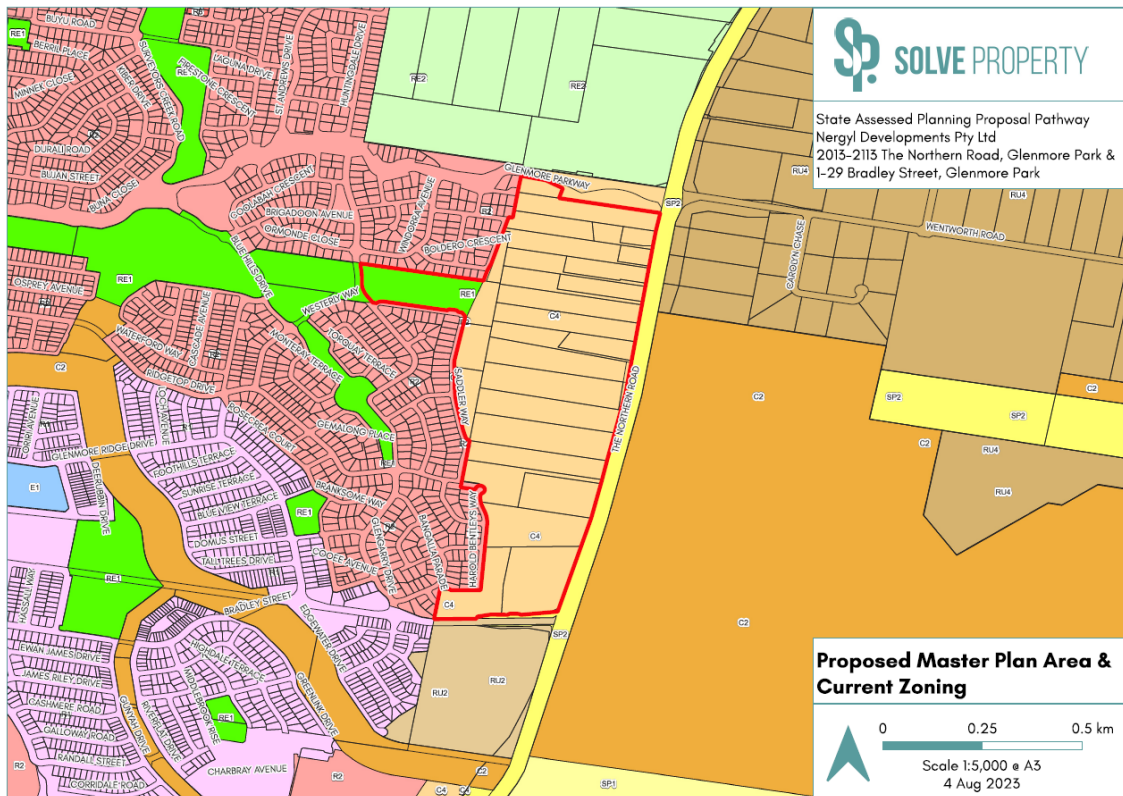


Figure 03: Land zoning of the subject area

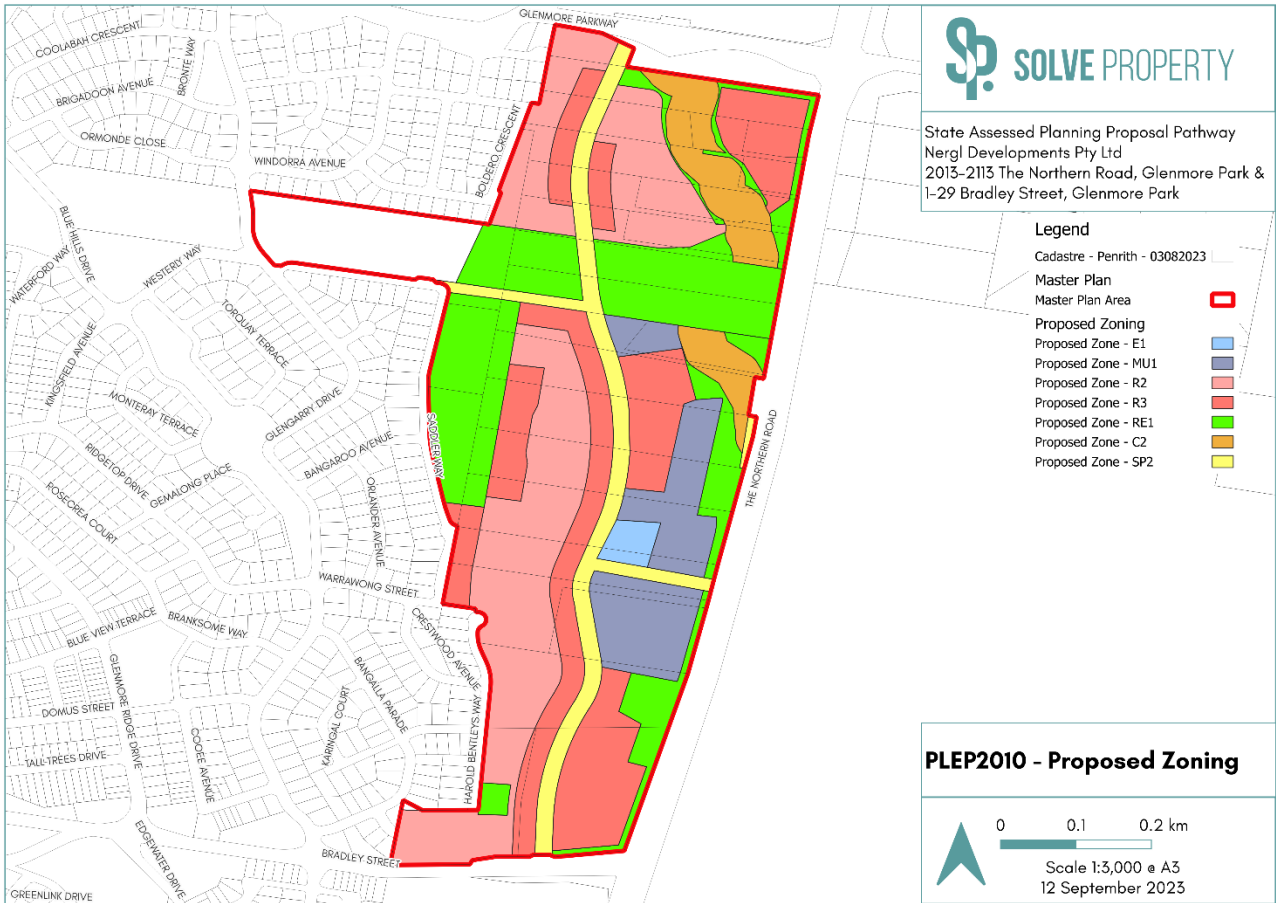


Figure 04: Proposed Zoning Map

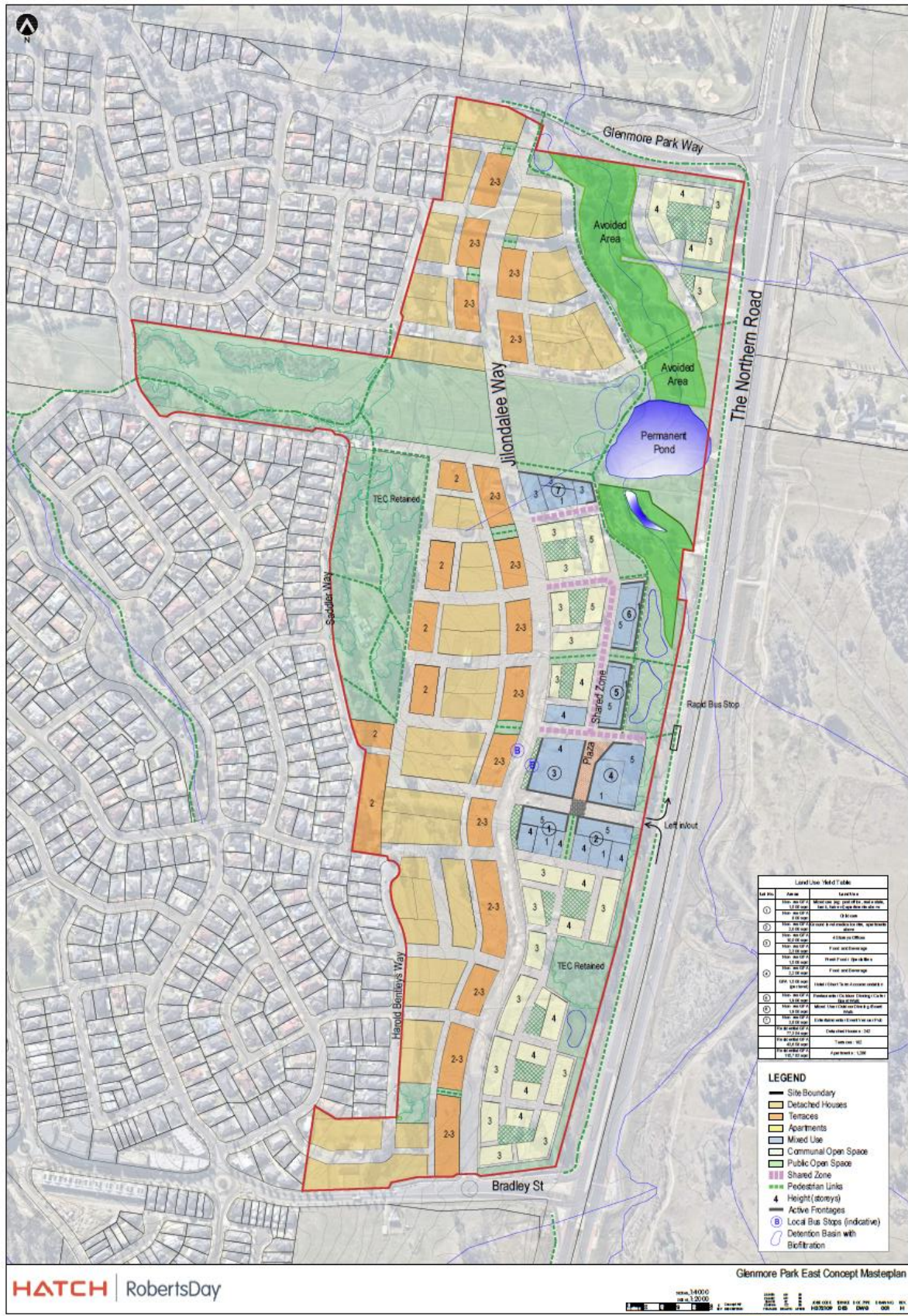


Figure 05: Extract of Master Plan prepared by RobertsDay

5.0 Bushfire Assessment

5.01 Preface

Properties considered to be affected by possible bushfire impact are determined from the local Bushfire Prone Land Map as prepared by Council and/or the Rural Fire Service. All development within affected areas is subject to the application of the relevant specifications and requirements of 'Planning for Bush Fire Protection - 2019' (PBP).

PBP formally adopted on the 1st March 2020 provides for the protection of property and life (including fire-fighters and emergency service personnel) from bushfire impact.

In this instance the subject site is depicted on Penrith City Council's Bushfire Prone Land Map as containing Category 2 Vegetation and Vegetation Buffer. The subject site is therefore considered to be 'bushfire prone land'.

When preparing a planning proposal s9.1(2) of the EP&A Act is required to be applied. Direction 4.4 'Planning for Bushfire Protection' of the s9.1(2) Direction, applies when a Council prepares a draft LEP that affects, or is in proximity to, land mapped as bushfire prone. Under these directions the following objectives apply:

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

Under direction 4.4 the Commissioner of the NSW RFS must be consulted and any comments taken into account. As part of the consultation process with the NSW RFS, a bush fire assessment is required to be submitted to demonstrate compliance with the s9.1(2) Directions and PBP.

Consideration must be given to limiting or excluding incompatible development in bushfire affected areas commensurate with the level of risk. A key principle to ensure this is that future development is designed and sited capable of complying with PBP.

The NSW Rural Fire Service also encourages the application of zones that limit or exclude inappropriate development in bushfire prone areas where:

- *the development area is exposed to a high bush fire risk and should be avoided;*
- *the development is likely to be difficult to evacuate during a bush fire due to its siting in the landscape, access limitations, fire history and/or size and scale;*
- *the development will adversely effect other bush fire protection strategies or place existing development at increased risk;*
- *the development is within an area of high bush fire risk where density of existing development may cause evacuation issues for both existing and new occupants; and*
- *the development has environmental constraints to the area which cannot be overcome.*

We provide the following assessment in consideration of the above and *Planning for Bush Fire Protection 2019* to highlight the suitability of the site for residential development and the relevant Bushfire Protection Measures.

5.02 Strategic Bush Fire Study

Planning proposals which relate to bushfire prone properties require the preparation of a Strategic Bush Fire Study. The Strategic Bush Fire Study (SBFS) provides opportunity to assess the broader landscape and ultimately assesses whether the new zones and proceeding development is appropriate in the bushfire hazard context.

The broad principles which apply to the SBFS analysis are:

- 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.

Once the strategic assessment has been addressed in the SBFS, an assessment of whether the future land uses can comply with the aim and objectives and specific bushfire protection measures of PBP must then be carried out. The assessment against PBP is addressed in section 5.03 of this report.

The following assessment details the components in Table 4.2.1 of PBP which must be addressed in a SBFS.

Bushfire Landscape Assessment

The Bushfire Landscape Assessment component considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.

Location

The subject site comprises of twenty-seven (27) existing allotments, zoned C4: Environmental Living and RE1: Public Recreation located at 2013-2113 The Northern Road and 1-29 Bradley Street, Glenmore Park.

The site is within the Greater Sydney Region Fire Weather District and is captured by the Cumberland Bush Fire Risk Management Plan 2020.

The site is 47.95-hectare (ha) in size and bounded by the recently upgraded The Northern Road to the east, Glenmore Parkway to the north, Bradley Street to the south and the existing Glenmore Park neighbourhood to the west.

The precinct is within the Penrith Local Government Area (LGA) and the land subject to this PP is described as **Glenmore Park East**.

The precinct is located 10km to the north of the new 24-hour Western Sydney International Airport and 5km south of the Penrith CBD and is centrally located within the Western Parkland City. The precinct is surrounded by the existing the stages of the Glenmore Park Estate (stages 1-3), Penrith Golf Course to the north, the state led Orchard Hills master planned precinct to the east and the Defence Establishment Orchard Hills to the southeast.

Vegetation

The vegetation structure, connectivity and attributes are fundamental contributors to bushfire behaviour and its movement through the landscape.

As part of this assessment, we have considered the potential bushfire runs (catchments) that currently exist into the site, as well as the potential fire behaviour and impacts following the delivery of the Master Plan.

Historically the primary use of the site has been for agriculture purposes, including the cultivation of arable crops and breeding and raising of livestock. These farming practices and other anthropological disturbances have resulted in degraded or fragmented vegetation, with only small pockets of vegetation.

To assess the potential fire runs into the site we have considered all existing vegetation within 1 kilometre and potential fire behaviour and impacts following the delivery of the Master Plan (Figure 08).

The existing vegetation within this assessment area was found to be fragmented, not providing opportunity for significant fire runs.

The most significant catchment for bushfire was identified to be from the southeast through Department of Defence lands. The existing vegetation along this catchment while presenting greater opportunity for fire development was also found to be fragmented, broken by existing grasslands and / or trails.

It is understood that the Department of Defence has set aside 978.83 hectares of land, located to the southeast of the subject site, to provide biodiversity offsets for the development of the Western Sydney International Airport (WSI). This 'Offset Area', comprises 938.48 hectares of managed vegetation and 40.35 hectares of supporting land uses such as tracks and easements (GHD, 2022).

The management actions of the Orchard Hills Offset Area, Offset Plan (GHD 2022) relevant to the area to the southeast of the subject site are shown at Figure 08.

The delivery of the 'Offset Area' to the southeast has also been considered as part of this assessment.

In this instance it is important to note that there are no fire catchments to the northwest of the development site, being the direction of winds providing weather conditions conducive with large spreading bushfires in this area (Cumberland BFRMP, 2020).

The land to the northwest of the subject site comprises of existing small lot residential development, sealed roads, active open space (including Blue Hills Oval) and Penrith Golf Club.

As part of the landscape assessment, we have considered land proposed to be zoned C2: Environmental Conservation, which comprises of a vegetated riparian zone.

The proposed C2: Environmental Conservation zoned land is bisected by a high voltage electrical transmission line easement and large proposed 'Permanent Pond', resulting in a separation of approximately 112 metres.

The northern portion of the proposed C2: Environmental Conservation zoned land is greater than a hectare in size (approx. 1.9ha) and has therefore been considered a bushfire hazard.

The southern portion of the proposed C2: Environmental Conservation zoned land is less than a Hecate in size (approx. 0.8ha) and greater than 100 metres from any other bushfire hazard and therefore will achieve the criteria for Low Threat Vegetation under A1.10 of PBP.

It is acknowledged that the Masterplan includes pockets of retained Threatened Environmental Communities within proposed RE1: Public Recreation zoned land. These pockets are to be broken by managed landscape (including tennis courts, paths etc), and active open space or proposed development.

We have assumed all land outside the proposed C2: Environmental Conservation zoned land within the site will either be developed, maintained to the standard of an Asset Protection Zone or achieve the criteria for Low Threat Vegetation in accordance with A1.10 of PBP.

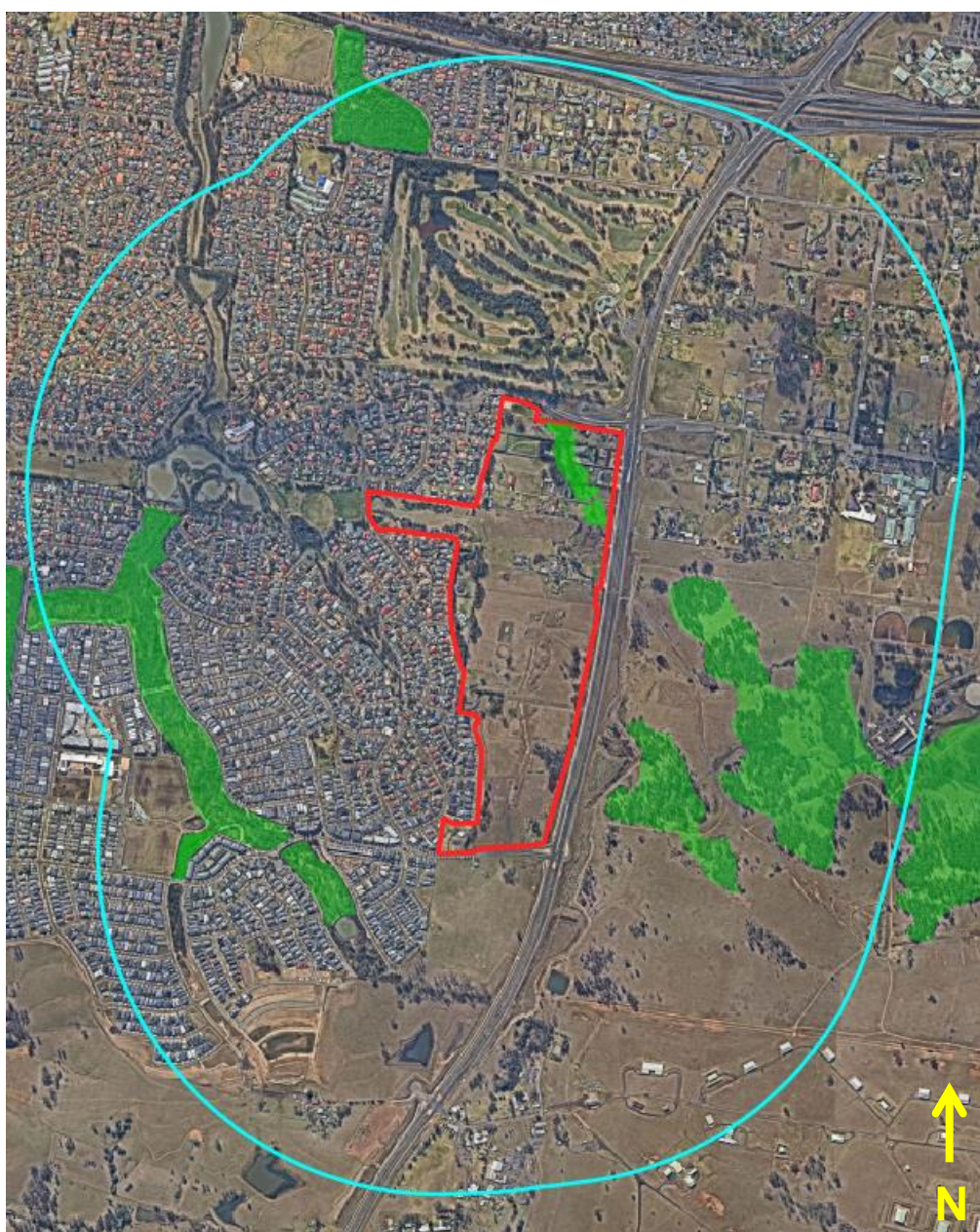


Figure 06: Aerial view of the subject area showing subject site (red outline), 1km buffer (blue outline) and bushfire hazards post development of the subject site (green shade)

The existing vegetation within the subject site is mapped (Hayes Environmental 2023) as being Cumberland Shale Plains Woodland (PCT 3320), Cumberland Red Gum Riverflat Forest (PCT 4025), planted native vegetation, unclassified native vegetation and swamp.

The existing vegetation posing a hazard to the east, beyond The Northern Road, is also mapped (Vegetation NSW) as being Cumberland Shale Plains Woodland (PCT 3320), Cumberland Red Gum Riverflat Forest (PCT 4025).

The following vegetation parameters apply to the mapped vegetation:

Plant Community Type	Formation	Class	Surface and Elevation Fuel Load*	Overall Fuel Load (including bark and canopy)*
Cumberland Shale Plains Woodland (PCT 3320)	Grassy Woodland	Coastal Valley Grassy Woodland	10 t/ha	18.07 t/ha
Cumberland Red Gum Riverflat Forest (PCT 4025)	Forested Wetlands	Coastal Floodplain Wetlands	8.2 t/ha	15.1 t/ha

* Fuel loads from NSW Rural Fire Service publication Comprehensive Vegetation Fuel Loads (2019)

In consideration of the extensive coverage of Cumberland Red Gum Riverflat Forest (PCT 4025) within the northern portion of the proposed C2: Environmental Conservation zoned land a Coastal Floodplain Wetlands hazard has been adopted for the purpose of this assessment.

Figure 07 overleaf shows the site specific vegetation assessment by Hayes Environmental.



Figure 07: Vegetation Assessment (Hayes Environmental, 2023)

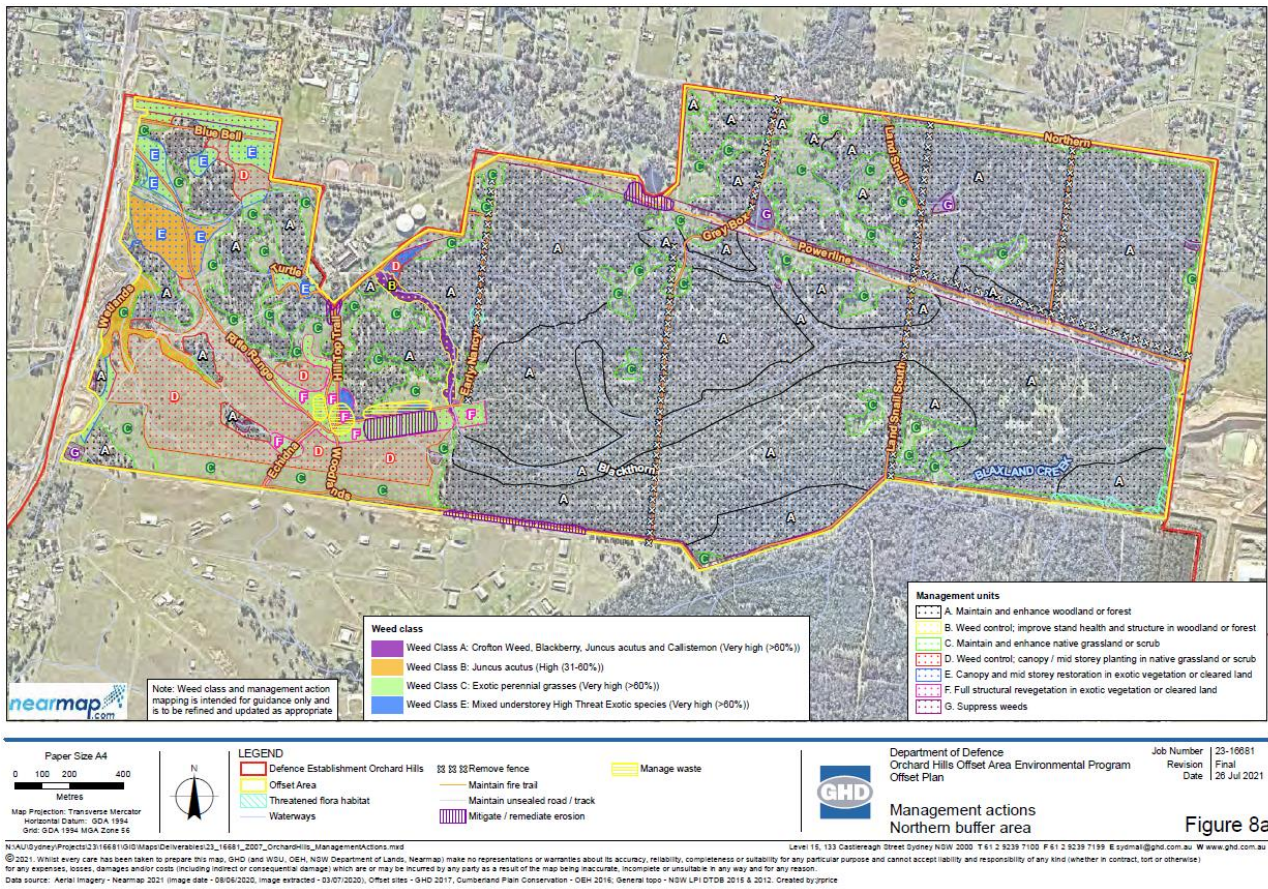


Figure 08: Extract from Orchard Hills Offset Area, Offset Plan (GHD 2022)

Slope and Topography

The slope of the land under the classified vegetation has a direct influence on the forward rate of spread, fire intensity and radiant heat exposure. The effective slope is considered to be the slope under the classified vegetation which will most significantly influence bushfire behaviour toward the development site.

In accordance with A1.4 'Determine slope' of PBP the slope assessment is to be derived from the most detailed contour data available.

The slope that would **most significantly** influence bushfire impact was determined using 2 metre LiDar contour mapping of the subject area.

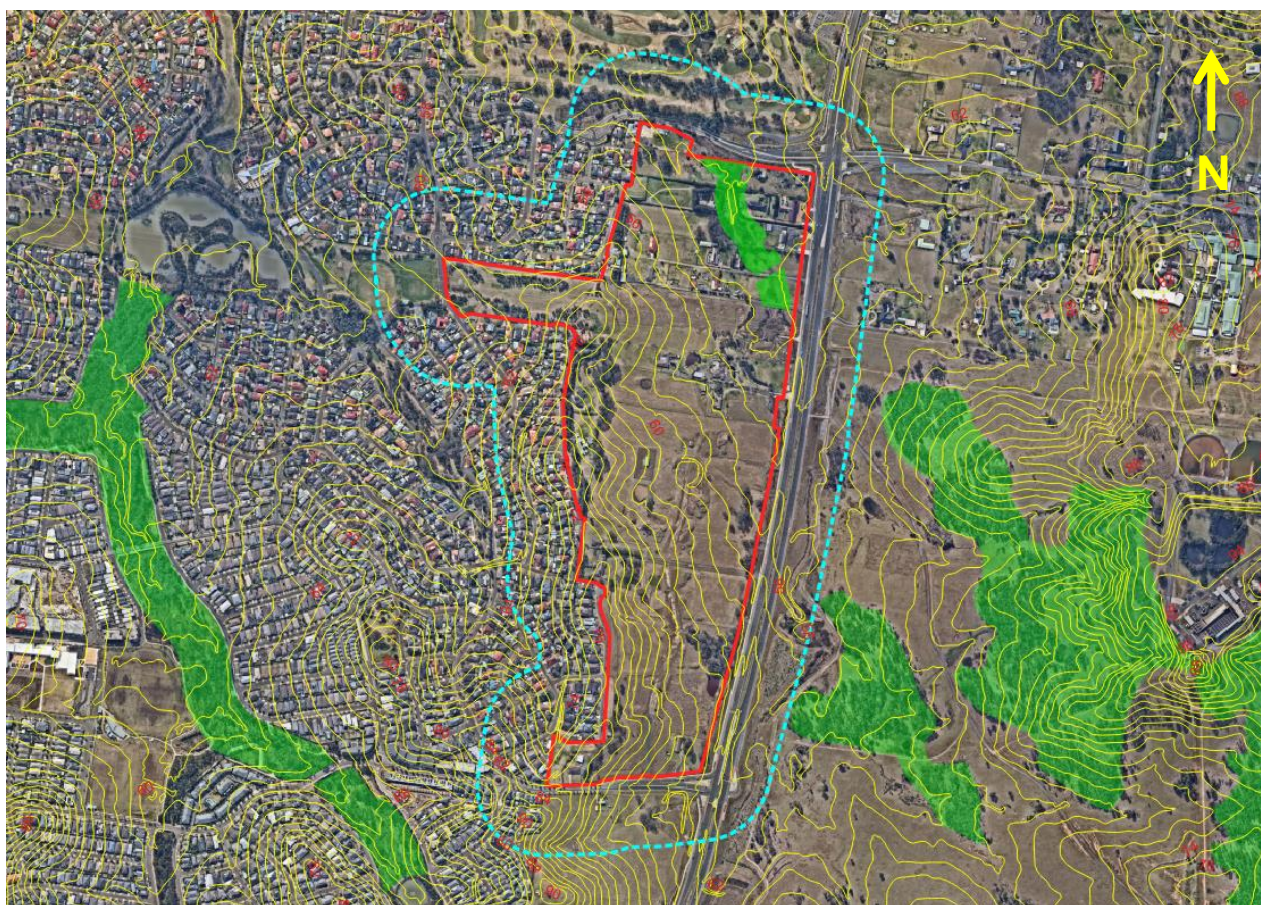


Figure 09: Aerial image overlaid with contour data, ELVIS – Geoscience Australia (2 metre contours)

Fire Weather

All development which attracts an Asset Protection Zone under PBP requires the identification of the relevant Fire Danger Index (FDI). The FDI required to be used for development assessment purposes is based on the local government boundaries, being Penrith City Council in this instance.

In accordance with the NSW Rural Fire Service publication 'NSW Local Government Areas FDI' (2017) Penrith City Council is located within the Greater Sydney Region Fire Weather District which attracts a Fire Danger Index (FDI) of 100 for bushfire planning purposes.

Previous Bushfire History

There are areas within NSW that have significant fire history and are recognised as known fire paths. In a planning context it is important to identify these locations and ensure incompatible development is not proposed.

In this instance the site was partially impacted in 2001-02 fire season – Penrith Complex Fire (source NPWS Fire History dataset). Since this fire event occurred further residential development has occurred to the west and southwest of the subject site, removing the available fire catchments.

Similarly, the area which was subject to a large fire which occurred during the 1982-83 fire season has also been developed removing available fire catchments.

Severe fire behaviour in this part of NSW is typically heavily influenced by hot dry northwest / westerly winds brought from inland Australia. These winds are the primary influence for the direction of a fire, generally pushing fires in a south-easterly / easterly direction. Southerly changes which are typically associated with strong winds that push fires in a northerly direction are an exception to this.

In this instance there are no available fire catchments to the northwest or west.

The site is therefore not considered to be within a known fire path.

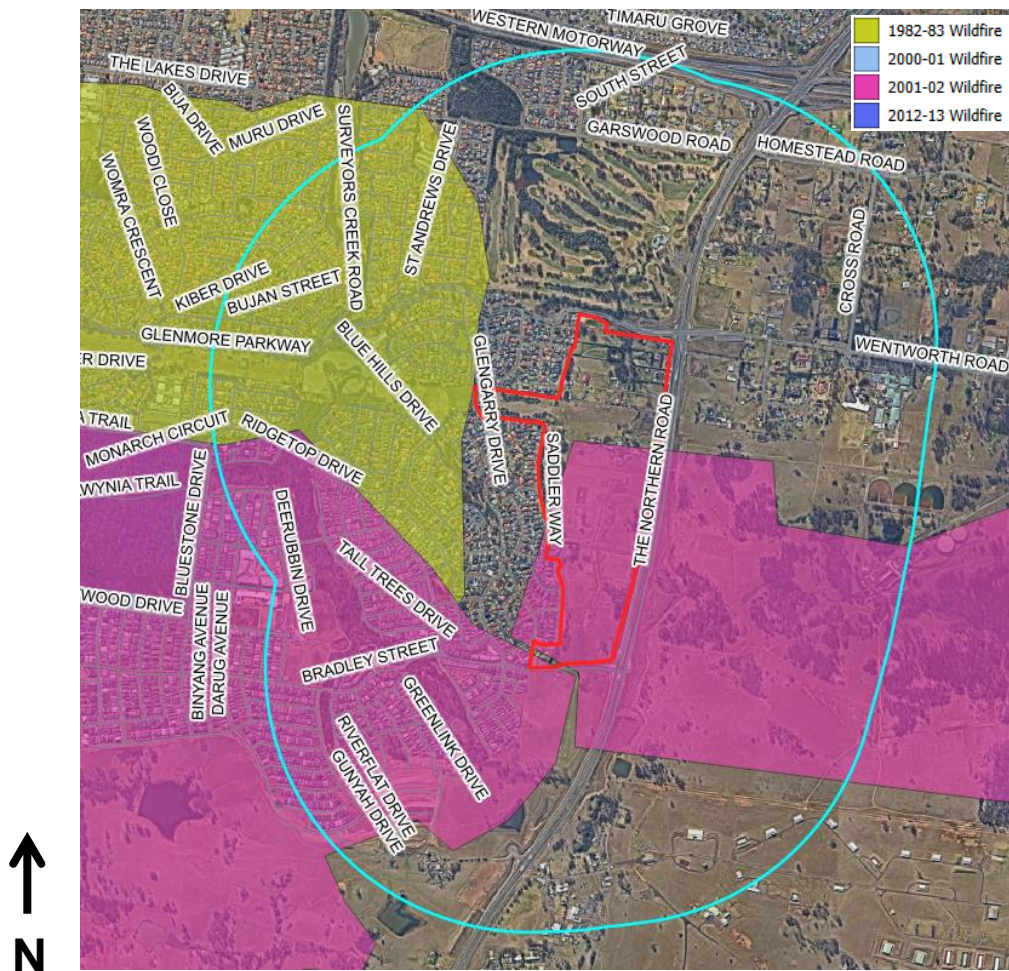


Figure 10: Aerial view of the subject area
Subject site (red outline), 1km buffer (blue outline)

Potential Fire Behaviour

The most significant bushfire threat to the subject site is considered to be from the southeast, beyond The Northern Road, from the Department of Defence Lands.

This aspect while having the largest catchment, would require a bushfire to burn against prevailing conditions conducive with large spreading bushfires in this area (Cumberland BFRMP, 2020) to impact the subject site.

The available bushfire catchment from this aspect is currently fragmented, limiting the opportunity for bushfire development.

It is acknowledged that there is an Offset Plan over this land (Orchard Hills Offset Area, Offset Plan 2022) which prescribes embellishment of the existing bushland areas. This Plan also identifies actions to maintain existing unsealed roads / tracks and fire trails. In addition, this Plan acknowledges a recent DEOH Property Bushfire Management Plan 2014-2019 and appropriate bushfire mitigation works.

When considering the potential bushfire impact to this aspect the comprehensive network of unsealed roads / tacks and fire trails and excellent public exposure for early identification, facilitating early extinguishment, must also be acknowledged.

In applying the parameters described in this section and accepted assessment methodology described in PBP bushfire design modelling indicates the vegetation posing a hazard to the north has the following potential outputs:

Bushfire Behaviour	Output
Flame Length	9.45 metres
Rate of Spread	1.12 km/h
Fire Intensity	10,456 kW/m

It must be noted that the above modelling does not factor in the site specific considerations described herein (or fire service / defence response) which are expected to reduce the severity of the bushfire behaviour and subsequent impact to the site.

Access & Suppression

Access for attending fire services to undertake early suppression is a key factor in whether a fire has the opportunity to develop into a quasi-steady state at which point the opportunity to control / extinguish the fire becomes far more challenging.

Where good access is available it provides opportunity to control / extinguish a fire in its growth phase before developing further and consequently becoming more difficult to conduct direct attacks.

In this particular instance comprehensive access will be available to the bushfire hazard within the subject site via the proposed internal road network. The internal road network includes perimeter roads adjacent the identified hazard.

Access to the hazards in the broader landscape is available via existing public roads and classified fire trails. Refer to Figure 11 for the extent of existing roads and classified fire trails in the subject area (source Transport NSW).

Classified fire trails must meet certain standards to be registered as such. This ensures that the NSW RFS and other fire agencies have confidence to deploy resources to a location, with confidence that they will be able to efficiently access and respond to an incident.

There is also a comprehensive network of unsealed roads / tacks and fire trails with the Defence lands to the southeast. These trails provide site ready containment lines to manage unplanned fire events. The ongoing management of these trails are nominated in the Orchard Hills Offset Area, Offset Plan 2022.

In consideration of the comprehensive access and its excellent exposure to the public the identification and subsequent extinguishment of a bushfire within the site or Defence lands is considered reasonable.

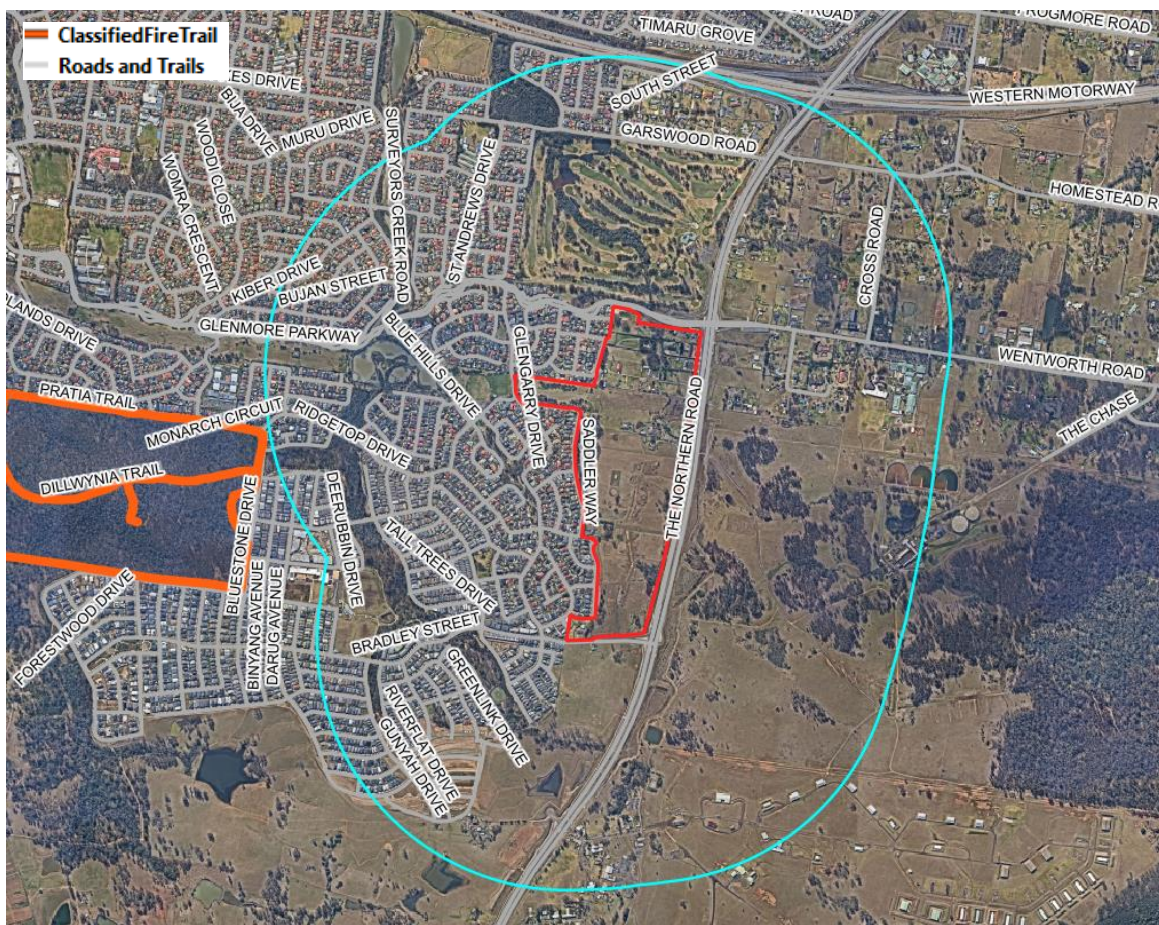
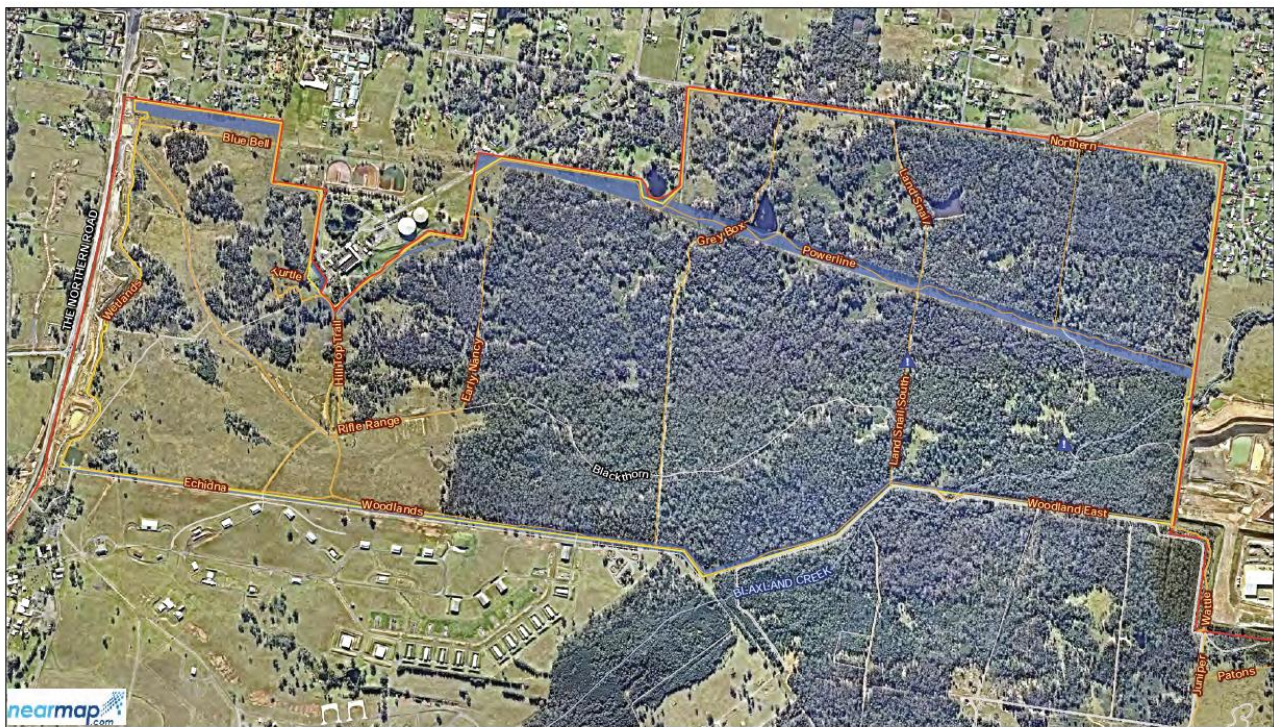


Figure 11: Aerial view of the subject area overlaid with roads, trails and classified fire trails (source Transport NSW)



<p>Paper Size A4</p> <p>0 100 200 400</p> <p>Metres</p> <p>Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 GCR: GDA 1994 MGA Zone 56</p>	<p>LEGEND</p> <ul style="list-style-type: none"> Defence Establishment Orchard Hills Offset Area Easement Fire trail Unsealed road / track Waterway ▲ No crossing 	<p>Department of Defence Orchard Hills Offset Area Environmental Program Offset Plan</p> <p>GHD</p> <p>Offset Area layout Northern buffer area</p>	<p>Job Number 23-10661 Revision Final Date 08 Jun 2022</p> <p>Figure 2a</p>
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C:\Users\mhoule\AppData\Local\Temp\BDE3123_16661_2022_OrchardHills_OffsetArea.layout.mxd
 © 2022. Whilst every care has been taken to prepare this map, GHD (and WSU, DEH, NSW Department of Lands, Department of Defence, Neamap) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.
 Data source: Aerial Imagery - Neamap 2022 (Image date - 08/06/2020, Image extracted - 03/07/2020), Offset sites - GHD 2017; General top - NSW LPI DT08 2015 & 2012; Roads & tracks - Department of Defence; Created by mhoule.

Figure 12: Extract from Orchard Hills Offset Area, Offset Plan (GHD 2022)

Land Use Assessment

The Land Use Assessment identifies the most appropriate locations in the Master Plan area for the proposed land uses. In a bushfire planning context the various land uses present different risk profiles and as such are assessed differently under Planning for Bush Fire Protection.

In this instance the proposal provides a mix of land uses including open space, medium and high density residential and mixed use (including listed Special Fire Protection Purpose). In a bushfire planning context the various land uses present different risk profiles and as such are assessed differently under Planning for Bush Fire Protection.

Special Fire Protection Purpose (SFPP):

SFPP development is one which is occupied by people who are considered to be at-risk members of the community. In a bushfire event, these occupants may be more susceptible to the impacts of bush fire.

SFPP development consequently attracts the highest Bushfire Protection Measures commensurate to the risk profile. Most notably SFPP development, attracts large minimum required Asset Protection Zones, which in instances can preclude future development.

Development that is listed in section 100B of the *Rural Fires Act 1997* as SFPP are:

- (a) a school,
- (b) a child care centre,
- (c) a hospital (including a hospital for the mentally ill or mentally disordered),
- (d) a hotel, motel or other tourist accommodation,
- (e) a building wholly or principally used as a home or other establishment for mentally incapacitated persons,
- (f) seniors housing within the meaning of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004,
- (g) a group home within the meaning of State Environmental Planning Policy No 9—Group Homes,
- (h) a retirement village,
- (i) any other purpose prescribed by the regulations.

Section 47 of the *Rural Fires Regulation 2022* also lists additional SFPP development which are:

- (a) a manufactured home estate (within the meaning of State Environmental Planning Policy No 36—Manufactured Home Estates), comprising two or more caravans or manufactured homes, used for the purpose of casual or permanent accommodation (but not tourist accommodation),
- (b) a sheltered workshop, or other workplace, established solely for the purpose of employing persons with disabilities,
- (c) a respite care centre, or similar centre, that accommodates persons with a physical or mental disability or provides respite for carers of such persons,
- (d) student or staff accommodation associated with a school, university or other educational establishment,
- (e) a community bush fire refuge approved by the Commissioner

Buildings used for public assembly which have a floor area of greater than 500m² are also treated technically as SFPP development due to the evacuation challenges presented by large numbers of occupants.

In this instance the Planning Proposal acknowledges the future delivery of childcare facilities and a hotel for short-term accommodation being listed SFPP development. Residential zones can also permit, with consent, some SFPP uses.

In this regard a SFPP Asset Protection Zone (APZ) overlay (attachment 01) has been prepared to depict the minimum required for SFPP development.

While the APZ Overlay identifies some impact to residential land which can permit, with consent, SFPP development, the location of the childcare facilities and a hotel for short-term accommodation are outside the minimum required APZ.

Residential:

Residential development (increased density, subdivision, townhouses etc) presents the next highest risk profile and accordingly also attracts minimum required Asset Protection Zones. In this regard a Residential Asset Protection Zone overlay (attachment 02) has been prepared to depict the minimum required for residential development.

It should also be noted that this is a macro-level assessment and further refinement of the APZs at a micro level may be achieved.

Residential buildings exceeding three storeys in height are considered to be multi-storey and attract added considerations under PBP.

The proposed residential uses are located outside the minimum required Asset Protection Zones.

Commercial and Industrial:

Commercial development (excluding SFPP, hazardous industries or that which includes a managers residence) is considered to have the lowest risk profile of a built environment.

The National Construction Code (NCC) does not provide for any bush fire specific performance requirements for Class 5 to 8 structures and as such Australian Standard 3959 'Construction of buildings in bushfire-prone areas' does not apply as a set of 'deemed to satisfy' provisions.

Whilst bushfire is not captured in the NCC for Class 5-8 buildings, the following objectives will be applied in relation to access, water and services, and emergency and evacuation planning under PBP:

- to provide safe access to/from the public road system for firefighters providing property protection during a bush fire and for occupant egress for evacuation;
- to provide adequate services of water for the protection of buildings during and after the passage of bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building;
- to provide suitable emergency and evacuation (and relocation) arrangements for occupants of the development; and
- consideration of storage of hazardous materials away from the hazard wherever possible.

In addition to the above the infill residential development provisions detailed in Chapter 7 of PBP are also applied as the base for a package of measures any future commercial or industrial development. This includes the application of the residential APZs shown in (attachment 02).

All proposed commercial land uses can achieve compliance with the residential APZs.

Land Use:

The proposed Master Plan locates the majority of high density residential, mixed use and the SFPP development in areas which exceed the minimum required Asset Protection Zones.

The riparian areas, which present the bushfire threat, are generally framed by managed open space and roads. These managed areas and roads provide a defensible space for fire services and maximise the land use when applying the Asset Protection Zones.

In consideration of the landscape study and risk profiles we are of the opinion the proposed land uses are appropriate.

Access and Egress

It is important to assess the capacity of both the existing and proposed road networks both within and external to the investigation area to deal with evacuating residents and responding emergency services.

In this instance the northern portion of the proposed C2: Environmental Conservation zoned land will present the greatest threat post-delivery of the Master Plan. This corridor will be fragmented due to the presence of various infrastructure (high voltage electrical transmission line easement), proposed permanent pond, The Northern Road and development and subsequently will not support broad scale fire events.

There must be sufficient time for residents / occupants to safely evacuate and reasonable threat posed for emergency services to order / encourage the evacuation of an area.

In consideration of the characteristics of the bushfire threat, inclusive of size and rate of spread and the fact future development will comply with current bushfire planning controls, inclusive of construction standards, it is considered unlikely emergency services would order / encourage the evacuation of the investigation area.

It is acknowledged that future residents may choose to evacuate / relocate from the area based on their own individual risk assessment.

Regardless the Master Plan provides numerous evacuation routes and ample opportunity to relocate from the area.

Comprehensive access will be available to the onsite bushfire hazard for attending fire services via the proposed road network. The access design results in interface access and breaks in the vegetation providing excellent control lines and opportunity to extinguish a bushfire.

The proposed road network will comply with the relevant access requirements outlined in Planning for Bush Fire Protection 2019.

Access to the hazards in the broader landscape is available via existing public roads and classified fire trails. Refer to Figure 11 for the extent of existing roads and classified fire trails in the subject area (source Transport NSW).

There is also a comprehensive network of unsealed roads / tracks and fire trails with the Defence lands to the southeast. These trails provide site ready containment lines to manage unplanned fire events. The ongoing management of these trails are nominated in the Orchard Hills Offset Area, Offset Plan 2022.

The access and egress routes are considered acceptable.

Emergency Services

In some circumstances the scale of a planning proposal warrants a need to include provisions for a new fire station.

The site is located within a NSW Rural Fire Service area, with a station (Regentville Rural Fire Brigade) located along Jeanette Street approximately 3 km to the northwest of the subject site, measured in direct line of site. Additional NSW Rural Fire Service stations are also located at Orchard Hills, Mulgoa and Wallacia.

NSW Fire & Rescue also have stations located within the townships of Regentville, Ropes Crossing and Penrith.

In consideration of the relatively modest population increase relating to this planning proposal and assessed bushfire risk the existing fire service coverage is considered acceptable.

Infrastructure

An assessment of the issues associated with infrastructure and utilities must be undertaken. This assessment is to include the ability of the reticulated water system to deal with a major bushfire event in terms of pressures, flows and spacing of hydrants.

There are hydrants available along the existing surrounding public roads within the area. The capabilities of the broader hydrant network is the responsibility of Sydney Water.

The sizing, spacing and pressures of any future hydrant system must comply with AS2419.1-2021.

It is understood that the proposal will not directly impact any existing electrical or gas infrastructure.

5.03 Planning for Bush Fire Protection

As the strategic issues have been satisfactorily addressed in the SBFS, an assessment of compliance with PBP is required. This section addresses the future developments capacity to comply with the relevant specifications and requirements of PBP.

The application of PBP requires satisfactory demonstration of the aim and objectives and the specific objectives and bushfire protection measures relevant to the type of development. The bushfire protection measures detailed in Chapters 5, 6 and 8 of PBP have been considered.

The following table details the aim and objectives of *Planning for Bush Fire Protection 2019* and the proposals ability to comply.

Aim / Objective	Comment
<i>The aim of PBP is 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.</i>	With the inclusion of the bushfire protection measures discussed herein it is of our opinion that the aim of PBP will be satisfied.
<i>(i) afford buildings and their occupants protection from exposure to a bush fire;</i>	<p>The proposed land uses can support the minimum required Asset Protection Zones for residential development.</p> <p>In conjunction with the application of the relevant Bushfire Attack Level under Australian Standard 3959 'Construction of buildings in bushfire-prone areas' future buildings and their occupants will be afforded protection from exposure to a bushfire.</p>

Objective	Comment
<i>(ii) provide for a defensible space to be located around buildings;</i>	The conservation areas, which present the highest direct bushfire threat, are framed by roads. These roads provide a defensible space for fire services and logical fire-fighting platforms.
<i>(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i>	The application of the minimum required APZs in conjunction with the relevant Bushfire Attack Level for the future buildings will prevent the likely fire spread to buildings.
<i>(iv) ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i>	<p>Comprehensive access will be available to the onsite bushfire hazard for attending fire services via the internal road network.</p> <p>The access design provides perimeter roads adjacent the identified bushfire hazard allowing direct access for attending fire services undertaking fire suppression activities.</p> <p>Access to the hazards in the broader landscape is available via existing public roads and classified fire trails.</p> <p>There is also a comprehensive network of unsealed roads / tracks and fire trails with the Defence lands to the southeast.</p>
<i>(v) provide for ongoing management and maintenance of bush fire protection measures, (BPMs); and</i>	The specific bushfire protection measures of the future developments will be addressed within the submission documents of those developments.
<i>(vi) ensure that utility services are adequate to meet the needs of firefighters.</i>	<p>The capabilities of the broader hydrant network is the responsibility of Sydney Water.</p> <p>The sizing, spacing and pressures of any future hydrant system within the site must comply with AS2419.1-2021.</p> <p>These future hydrants are considered to be the logical water supply for fire services undertaking hazard reduction and / or fire suppression activities.</p>

It is therefore of our opinion that the proposal can satisfactorily comply with the aim and objectives of *Planning for Bush Fire Protection 2019*.

Asset Protection Zones

Asset Protection Zones (APZs) for Special Fire Protection Purpose (SFPP) developments are determined from Table A1.12.1 of Planning for Bush Fire Protection 2019 (PBP) or bushfire design modelling achieving a radiant heat impact of no more than 10 kW/m² at a building footprint.

The minimum required Asset Protection Zones for the future SFPP development were determined from Table A1.12.1 of PBP and are depicted on the attached SFPP APZ Overlay (attachment 01).

APZs for residential subdivision and increased density are determined from Table A1.12.2 of Planning for Bush Fire Protection 2019 (PBP) or bushfire design modelling achieving a radiant heat impact of no more than 29 kW/m² at a building footprint.

The minimum required Asset Protection Zones for the future residential development were determined from Table A1.12.2 of PBP and are depicted on the attached Residential APZ Overlay (attachment 02).

The available APZs consist of the land entirely within the subject site (including roads and active open space).

The Master Plan has the capacity to comply with the minimum required Asset Protection Zones as detailed in PBP.

Fire Fighting Water Supply

There are hydrants available along The Northern Road and surrounding existing public roads.

The sizing, spacing and pressures of any future internal hydrant system must comply with AS2419.1-2021.

The subject site has the capacity to comply with the Water Supply requirements as detailed in sections 5.3.3 and 6.8.3 of PBP.

Access

Planning for Bush Fire Protection addresses design considerations for internal roads (public roads) for properties determined to be bushfire prone. In a bush fire prone area, the purpose of the road system is to:

- provide firefighters with access to structures, allowing more efficient use of firefighting resources;
- provide evacuation routes for firefighters and the public; and
- provide access to areas of bush fire hazard for firefighting and hazard mitigation purposes.

The subject site has street frontage to Glenmore Parkway to the north, The Northern Road to the east, Bradley Street to the south and various local roads to the west.

Planning for Bush Fire Protection addresses design considerations for internal roads (public roads) for properties determined to be bushfire prone.

The proposed Master Plan prepared by RobertsDay provides connection points to all adjacent public roads, providing egress opportunities in all directions.

The proposed Master Plan also includes perimeter roads adjacent the onsite bushfire hazard and utilises through roads throughout the design, satisfying the preferred design option.

Chapters 5-8 of PBP detail performance criteria and acceptable solutions for access arrangements, relevant to the development type.

Roads adjacent to the onsite bushfire hazard will be considered Perimeter Roads and to satisfy the acceptable solutions of PBP must provide a minimum carriageway of 8 metres, with parking outside the carriageway.

All other roads on bushfire prone land will be considered Non-Perimeter Roads and to satisfy the acceptable solutions of PBP must provide a minimum carriageway of 5.5 metres, with parking outside the carriageway.

We are satisfied that the proposed internal road system has the capacity to comply with the requirements for Access under Chapters 5-8 of PBP.

6.0 Conclusion

Building Code and Bushfire Hazard Solution P/L has been commissioned to prepare an independent Bushfire Assessment Report for a Planning Proposal at 2013 - 2113 The Northern Road and 1 - 29 Bradley Street, Glenmore Park (Glenmore Park East).

The precinct is currently zoned C4 Environmental Living (44.93 hectares), R2 Low Density Residential (225 square meters), SP2 Infrastructure (113 square meters) and RE1 Public Recreation (2.98 hectares) under the PLEP 2010. Land within the precinct is currently utilised for rural residential lifestyle properties, with part of the precinct having been approved for a 17-lot rural residential subdivision in 2005.

The proposed Master Plan provides for approximately 1,710 new homes, offering a diverse range of housing options to meet the needs of a changing community. These new homes include approximately 242 traditional detached homes (with an average site area of 320 square meters), 182 smaller attached terraces (with an average site area of 240 square meters), and 1,286 (1, 2 and 3 bedroom) apartments (with an average size of 90 square meters).

Furthermore, the proposed Master Plan accommodates a range of non-residential uses in the precinct, including mixed-use retail spaces, childcare facilities, medical services, food and beverage establishments, a fresh food market, specialty shops, restaurants and cafes, entertainment venues, offices, and a hotel for short-term accommodation supporting visitors and the requirements of nearby defence industry partners. This diverse range of services and amenities aims to meet the needs of both residents and visitors to the precinct.

In this instance the subject site is depicted on Penrith City Council's Bushfire Prone Land Map as containing Category 2 Vegetation and Vegetation Buffer. The subject site is therefore considered 'bushfire prone'.

We are satisfied that the subject site and proposed Master Plan has the capacity to comply with the relevant specifications and requirements of *Planning for Bush Fire Protection 2019*.

Furthermore we are satisfied that the proposed Master Plan, in combination with the bushfire protection measures discussed herein will not result in areas that are difficult to evacuate, create control difficulties during a bushfire or adversely affect other bush fire protection strategies or place existing development at increased risk.

We are therefore in support of the Planning Proposal.

Should you have any enquiries regarding this project please contact me at our office.

Prepared by
Building Code & Bushfire Hazard Solutions P/L



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Certificate IV Fire Technology
FPA Australia BPAD Level 3 Accredited Practitioner
BPAD Accreditation No. BPAD9400



Reviewed by
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Senior Bushfire Consultant
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Planning for Bushfire Prone Areas - UTS Sydney
FPA Australia BPAD Level 2 Accredited Practitioner
BPAD Accreditation No. BPAD30356



7.0 Annexure 01

List of Referenced Documents

Australian Building Codes Board (2022). *National Construction Code Volume Two - Building Code of Australia*. ABCB

ELVIS -Elevation -Foundation Spatial Data. Elevation.fsd.org.au. Available at: <http://elevation.fsd.org.au/>

Environmental Planning and Assessment Act 1979

GHD Pty Ltd (2022). Department of Defence – Orchard Hills Offset Area, Offset Plan, June 2022

NSW Department of Planning and Environment (2019). *Planning Portal*. Accessed at: <https://www.planningportal.nsw.gov.au/>

NSW Rural Fire Service (2019). *Planning for Bushfire Protection. A Guide for Councils, Planners, Fire Authorities and Developers*.

RobertDay (2023). Glenmore Park East Concept Masterplan, job code H372109, dwg no 001, rev H, dated 13.09.2023

Rural Fires Act 1997

Rural Fires Regulations 2022

Rural Fire Service NSW (2005). *Standards for Asset Protection Zones*

Rural Fire Service NSW (2017). *NSW Local Government Areas FDI*

Standards Australia (2018). *AS3959 Construction of buildings in bushfire-prone areas*.

Standards Australia (2014). *AS/NZS 1596 The storage and handling of LP Gas*

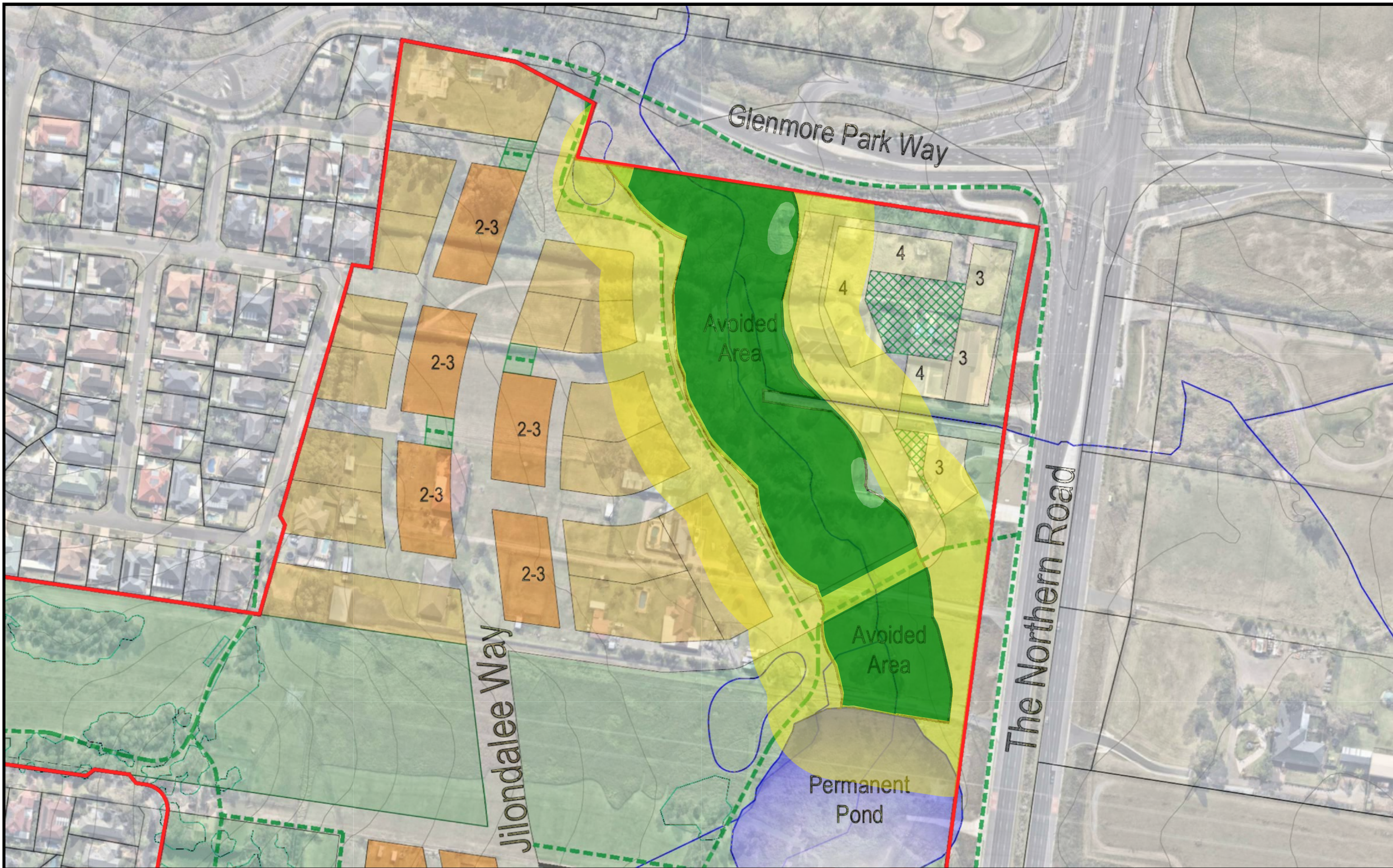
Acknowledgements to:

Geoscience Australia
Nearmap
Street-directory.com.au

Attachments

Attachment 01: SFPP Asset Protection Zone Overlay

Attachment 02: Residential Asset Protection Zone Overlay



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 Telephone: (02) 9457 6530
 www.bushfirehazardsolutions.com.au



Legend

- Subject site
- Min SFPP APZ - 42m
- Riaprian Hazard

**SFPP APZ
 Overlay**

BCBHS Ref: 240152
 Drawn by: SM
 Dated: 14/09/2023
 Issue: 1Scale: NTS
 Client: Nergl Developments Pty Ltd
 Address: Glenmore Park East



Bushfire Hazard Solutions
 (Pty. Limited) ABN 19 057 337 774
 PO Box 124, Berowra NSW 2081
 Telephone: (02) 9457 6530
 www.bushfirehazardsolutions.com.au



Legend

- Subject site
- Min SFPP APZ - 42m
- Riparian Hazard

Residential APZ Overlay

BCBHS Ref: 240152
 Drawn by: SM
 Dated: 14/09/2023
 Issue: 1Scale: NTS
 Client: Nergl Developments Pty Ltd
 Address: Glenmore Park East