BLACKASH
BUSHFIRE CONSULTING

Part 5 Bushfire Hazard Assessment

New High School for Schofields and Tallawong

201 Guntawong Road, Tallawong

Prepared for

The Department of Education

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

Date 28 February 2025

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Disclaimer

Contents

1. Executive Summary

1.1.Key Findings

This Bushfire Assessment Report has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI). The purpose of this report is to consider bushfire risk and assess the potential environmental impacts that could arise from the activity.

The activity is not on designated Bushfire Prone Land (BFPL).

The significance of a Review of Environmental Factors (REF) in relation to bushfire lies in its role in evaluating potential fire hazards and ensuring that proposed activities align with fire safety standards and mitigation strategies. This assessment is essential to protect life, property, and environmental values, reducing the likelihood and impact of bushfires on the project area and surrounding communities.

From a bushfire risk and mitigation perspective:

1. The extent and nature of potential impacts are low and will not have significant impact on the locality, community and/or the environment.
2. Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the locality, community and/or the environment.
3. Bushfire risk can be adequately mitigated through recommended measures.
4. Bushfire risk is not considered to be a significant impact.

Mitigation measures are essential components of this Bushfire Assessment Report, aimed at assessing bushfire risk to the site and future occupants and reducing or eliminating potential environmental impacts associated with the proposed activity. These measures have been carefully developed based on rigorous bushfire assessments, applicable legislation, and the requirements of Planning for Bushfire Protection 2019 to ensure bushfire protection while balancing protection of the environment and risk mitigation. By implementing these mitigation measures, the project seeks to address identified risks, enhance bushfire and environmental outcomes, and promote sustainable development practices, ensuring compliance with bushfire regulatory requirements and alignment with broader environmental objectives.

Mitigation measures are provided in Table 12 to ensure the activity is compliant with the NSW and national framework for bushfire mitigation.

The school buildings are not within designated Bushfire Prone Land or are likely to be subject to bushfire attack (building are separated by 50m for grassland and 100m for woodland) and as such, Specification 43 is not applicable to the school buildings or within the site. There are no requirements for the provision of Specification 43.

1.2. Approvals and Licenses Required

Approvals and licenses for a Review of Environmental Factors (REF) ensure that proposed activities comply with relevant environmental legislation and regulatory requirements.

No approvals or licences are required for the activity in relation to bushfire.

2. Introduction

This Bushfire Assessment Report has been prepared to support a Review of Environmental Factors (REF) for the Department of Education (DoE) for the construction and operation of the new Schofields - Tallawong High School (the activity).

The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the NSW Department of Planning, Housing and Infrastructure (DPHI). The purpose of this report is to consider bushfire risk and assess the potential environmental impacts that could arise from the activity. Mitigation measures are provided to meet the requirements of *Planning for Bushfire Protection 2019* (PBP) and the *National Construction Code* (NCC) as benchmarks for tolerable risk from bushfire, balancing potential harm and the benefits of the activity, while implementing reasonable measures to manage bushfire risk effectively.

The site is not on designated Bushfire Prone Land (BFPL). As the site is not designated as Bushfire Prone Land, no legislative formal bushfire assessment is required. However, the DoE recognise bushfire as a potential risk and seek to appreciate the risk and mitigation measures to provide for the safety of the school community.

3. Credentials and Approach to the Report.

This Bushfire Assessment Report has been prepared by Lew Short, Director at Blackash Bushfire Consulting (Level 3 FPAA BPAD-A Certified Practitioner No. BPD-PA-16373) who is recognised by the NSW Rural Fire Service (RFS) as qualified in bushfire risk assessment and has been accredited by the Fire Protection Association of Australia as a suitably qualified consultant to undertake alternative solution proposals (Curriculum Vitae at Attachment 1).

Lew Short (LS) is a Bushfire Expert and Director at Blackash Bushfire Consulting and has the qualifications and experience contained in his Curriculum Vitae (refer Annexure A). This report has been independently prepared by a qualified bushfire expert to assess the proposed activity against relevant bushfire provisions, ensuring unbiased compliance with safety and bushfire standards and requirements. The assessment identifies potential bushfire risks and outlines measures to mitigate these risks in line with current bushfire management practices and regulations.

A site inspection was completed on 17 October 2024.

4. Project Proponent and Stakeholders

The DoE is the proponent and determining authority pursuant to Section 5.1 of the EP&A Act.

Blackash has not undertaken any agency consultation in the preparation of this report. However, the DoE have held numerous meetings with the RFS in relation to bushfire considerations and requirements.

5. Legislative Framework and Planning Context

The site is not on designated Bushfire Prone Land.

The proposal is categorised as a Special Fire Protection Purpose (SFPP) development in accordance with Section 100B of the *Rural Fires Act, 1997* (RF Act).

The DoE is the proponent and determining authority pursuant to Section 5.1 of the EP&A Act. The Part 5 assessment is exempt from requiring a Bushfire Safety Authority from the RFS.

Under Part 5 of the EPA Act, the consultation process requires public authorities to assess the environmental impact of activities and consider potential risks before proceeding.

6. Site Description

The site is known as 201 Guntawong Road, Tallawong, NSW, 2762 (the site), and is legally described as part of Lot 1 in Deposited Plan 1283186. The site is located at the corner of Guntawong Road and Clarke Street, Tallawong and is approximately 4 hectares in area. The site has an approximately 100-metre-long frontage to Guntawong Road along its northern boundary. Nirmal Street provides a partial frontage along the eastern boundary of the site with plans to extend Nirmal Street to provide a future connection to Guntawong Road.

The site is predominantly cleared land and consists of grassland with several patches of remnant native vegetation particularly within the northern portion of the site. As a result of precinct wide rezonings, the surrounding locality is currently transitioning from a semi-rural residential area to a highly urbanised area with new low to medium density residential development with supporting services. The site is located approximately 1.5km to the north west of Tallawong Metro Station and is also serviced by an existing bus stop along Guntawong Road.

7. Proposed Activity

The proposed activity is for the construction and operation of a new high school known as Schofields - Tallawong High School. The new high school will accommodate up to 1,000 students. The school will provide 49 permanent teaching spaces (PTS), and 3 support teaching spaces (STS) across three buildings (Figure 2).

The buildings will be three-storey in height and will include teaching spaces, specialist learning hubs, a library, administrative areas and a staff hub. Additional core facilities are also proposed including a standalone school hall, a carpark, a pick up and drop off zone along Nirmal Street, two sports courts and a sports field.

Specifically, the proposal involves the following:

- Three learning hubs (three-storeys in height) accommodating 49 general teaching spaces and 3 support learning units (SLUs).
- Other core facilities including amenities, library, staff hub and administrative areas.
- Standalone school hall.
- Separate carpark with 72 spaces.
- Kiss and drop zone along Nirmal Street.
- Open play space including sports courts and sports field.
- Public domain works.

The proposed site access arrangements are as follows:

- Main pedestrian entrance to be located off Nirmal Street.
- Kiss and drop zone proposed along Nirmal Street.
- Onsite parking access via Nirmal Street.

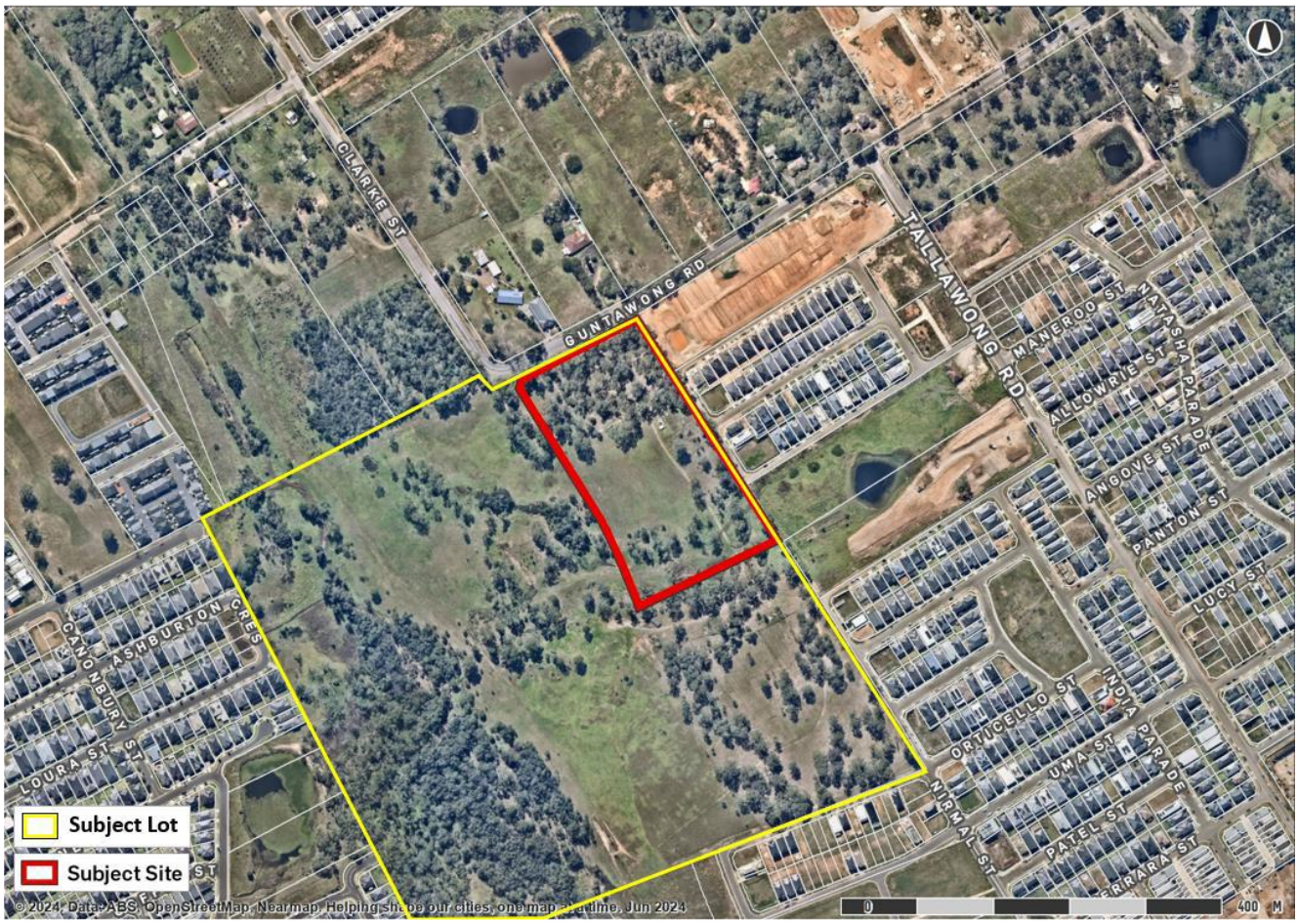

Figure 1 Site Location (Source Urbis)

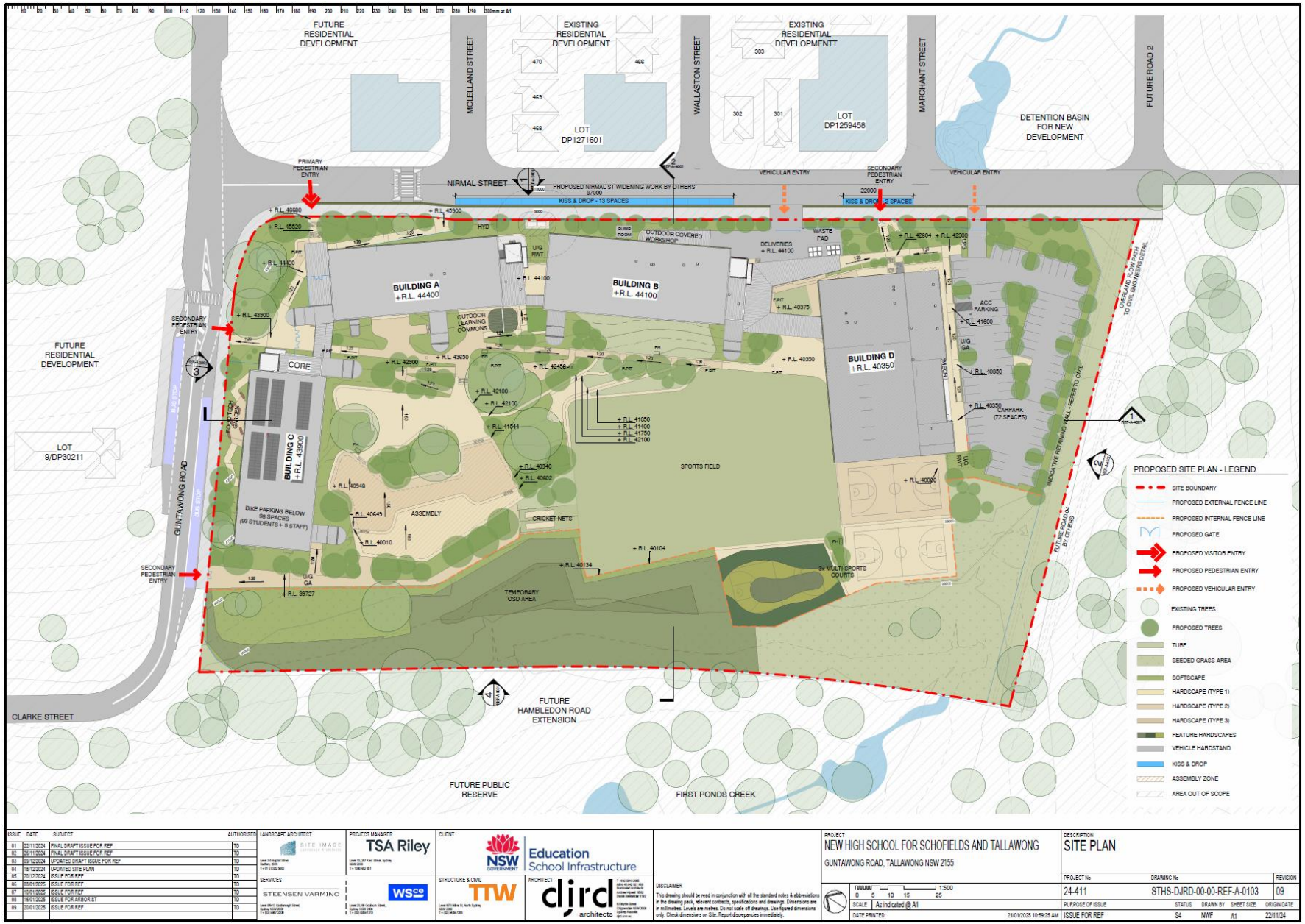

Figure 2 Proposed site plan (Source djrd Architects 2024)

8. Bushfire Assessment Framework

8.1.Planning for Bushfire Protection 2019

PBP 2019 is the formal NSW guideline which provides development standards for planning, designing and building on bushfire prone lands in NSW. PBP 2019 details specific provisions for SFPP development considering site specific risk, occupant vulnerability and the appropriate suite of bushfire protection measures (BPMs).

PBP 2019 sets out an overall framework consisting of an aim and objectives, specific objectives for defined development types, types of BPMs which may be employed in a development or risk assessment, and performance criteria for each BPM.

8.2. General Objectives of Planning for Bushfire Protection

All development on BFPL must satisfy the aim and objectives of PBP 2019. The aim of PBP 2019 is to *provide for the protection of human life and minimise impacts on property from the threat of bushfire, while having due regard to development potential, site characteristics and protection of the environment*. The objectives are to:

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

8.3. Specific Objectives for SFPP Development

The proposed school is a designated SFPP, defined in Section 100B(6) of the *Rural Fires Act* 1997. PBP 2019 states that:

> *"An SFPP development is one which is occupied by people who are identified as at-risk members of the community. In a bushfire event, these occupants may be more susceptible to the impacts of radiant heat and other bushfire effects. Evacuating at-risk members of the community is more challenging because they may be physically or psychologically less able to*

relocate themselves or are unfamiliar with their surroundings. Examples of SFPP developments are schools, hospitals, nursing homes and tourist accommodation."

The specific objectives within PBP 2019 for SFPP developments are to:

I. *minimise levels of radiant heat, localised smoke and ember attack through increased APZ, building design and siting;*
II. *provide an appropriate operational environment for emergency service personnel during firefighting and emergency management;*
III. *ensure the capacity of existing infrastructure (such as roads and utilities) can accommodate the increase in demand during emergencies as a result of the development; and*
IV. *ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants.*

See Table 12.

By demonstrating compliance with PBP 2019, the Objectives and Specific Objectives are met.

8.4.Specification 43 Building Code of Australia

Specification 43 Bushfire protection for certain Class 9 buildings (Spec 43) is the acceptable solution within the National Construction Code 2022 (NCC) for certain Class 9 buildings including schools on designated bushfire prone areas. The 2022 edition of the NCC contains amendments to its bushfire protection provisions. This includes a suite of new provisions for Class 9 buildings on designated bushfire prone areas that accommodate. The Building Code of Australia component of NCC is given legal effect through the *EPA Act*.

In NSW, all new buildings and new building work must comply with the NCC. NCC contains bushfire protection requirements that operate in conjunction with the bushfire protection measures (BPMs) in PBP 2019. Accordingly, buildings on bushfire prone areas must comply with both the requirements of PBP 2019 and the NCC.

The RFS *Planning for Bushfire Protection – Addendum 2022* states (p. 5) that:

NCC 2022 identifies additional bush fire provisions for the construction, separation and access requirements for certain Class 9 buildings accommodating vulnerable occupants on bush fire prone land.

Class 9 buildings include some Special Fire Protection Purpose (SFPP) developments under section 100B of the Rural Fires Act 1997, such as Class 9a hospitals, Class 9b schools and child care centres and Class 9c residential care buildings.

Additional Performance Criteria and Acceptable Solutions relevant to BPMs within PBP for SFPP Class 9 buildings are identified in Appendix B of this Addendum. These Acceptable Solutions are consistent with the relevant provisions of NCC 2022.

Consistent with section 100B of the Rural Fires Act 1997, proposed SFPP ' s that are Class 9 Buildings in bush fire prone areas may be required to have bush fire protection measures additional to those specified in NCC 2022.

The NSW specific Performance Criteria and Acceptable Solutions are at Appendix 2. The DoE will provide 100m separation in the form of an asset protection zone from the site boundary that will be enforceable by an easement with the adjoining landholder. The DoE have advised Blackash that the APZ easement agreement is already in progress with OSL and is a temporary measure until the area is developed.

The 100m APZ removes bushfire considerations as land that is greater than 100m from Category 1 vegetation or 50m from Category 2 and Category 3 Bushfire Prone Land is low hazard and no bushfire specifications or requirements apply to the buildings. As the proposed Activity is not being carried out on designated Bushfire Prone Land, the Activity is not subject to Specification 43 or Planning for Bushfire Protection 2019.

9. Significant Environmental Issues

The Subject Site (Figure 1) has been used for agricultural purposes and is cleared and managed. Other than building and development footprints, no additional trees are required to be removed to meet APZ requirements.

An assessment of significant environmental features, threatened species, population or ecological communities under the *Biodiversity Conservation Act 2016* that may potentially be affected by the proposed bushfire protection measures has not been undertaken in this report as it is covered by other technical deliverables prepared to support the REF.

The Asset Protection Zone (APZ) is identified within this report and should be considered by a suitably qualified ecologist for environmental impact. The APZ is consistent with existing land management

practices. DoE as the determining authority for this development will assess any potential environmental issues.

10. Bushfire Threat Assessment

10.1. Bushfire Prone Land

The site is not identified as 'bush fire prone land' (see Figure 3) for the purposes of Section 10.3 of the EPA Act and the legislative requirements for PBP 2019 are not applicable. The Blacktown BFPL map was certified 18 July 2008 and is out of date for recertification.

Bush fire prone land maps provide a trigger for the development assessment provisions and consideration of sites that are bushfire prone. Bushfire prone land (BPL) is land that has been identified by council, which can support a bushfire or is subject to bushfire attack. Bushfire prone land maps are prepared by local council and certified by the Commissioner of the NSW RFS.

The certified map is the in force map.

NCC 2022 provides a NSW Variation for **Designated Bushfire Prone Area** which is:

Land that:

1. *has been designated under legislation;* ***or***
2. *has been identified under an environmental planning instrument, development control plan* ***or*** *in the course of processing and determining a development application, as land that can support a bushfire or is likely to be subject to bushfire attack.*

Figure 5 shows the extent of land that is subject to bushfire attack within the site which is bound to the 100m buffer from the Category 1 Bushfire Prone Land or 30m from Category 2 land. The school buildings are not within land affected by *land that can support a bushfire or is likely to be subject to bushfire attack* and as such, Specification 43 is not applicable to the school buildings.

Figure 3 Certified Bush Fire Prone Land Map

11. Landscape Scale Assessment

A bushfire landscape assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.

The site does not have record of wildfire or hazard reduction burn since records have been kept in 1902. A hazard reduction burn was completed to the east of Worcester Road in 2017.

The area has a minimal documented history of bushfire activity within the vicinity of the site. Bushfires in western Sydney are primarily driven by prevailing westerly to north westerly winds and fuelled by dense vegetation. Potential fire runs into the site could occur from the northwest or the south. However, land to the northwest is being rapidly developed and remnant vegetation is fragmented or has been cleared and managed for agricultural purposes making the potential for high intensity fire at the site remote.

In the area within vicinity of the proposed Activity, the remnant vegetation is relatively fragmented, with a mix of developed areas, agricultural practices, patches of remnant vegetation and grassland areas that act as natural firebreaks, slowing the spread of fire. This fragmentation of fuels creates barriers that reduce fire intensity and provide critical points for firefighting teams to intervene effectively. With well-established roads and access tracks, fire crews have a greater ability to reach various parts of the area quickly, facilitating a more rapid and coordinated response. The availability of local roads also supports the strategic positioning of fire trucks and water tankers, improving the ability to contain and suppress fires before they escalate.

The site has direct access to existing developed areas to the east of the site. These areas offer refuge potential with multiple access and egress routes out of the area available to the south on Tallawong and Cudgegong roads and to the north on Guntawong and Clarke Street. As the area develops additional road infrastructure will be built increasing access options.

11.1. Blackash Landscape Scale Assessment Tool

The bushfire landscape assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape. The likelihood of a bushfire, its severity and intensity, and the potential impact on life and property varies depending on where a site is located in the landscape. Two types of considerations are relevant in terms of assessing the bushfire hazard including:

- landscape scale hazard – where large expanses of vegetation over tens to hundreds of hectares are located in immediate proximity to, and may traverse, urban periphery suburbs/townships
- localised hazard – which is most commonly presented by fragmented areas of vegetation larger than 1 hectare in size

Land to the west and south has been predominantly cleared and consists of remnant Eucalyptus trees within grassland which at the time of inspection had been recently slashed. The site is not affected by Bushfire Prone Land. The Blackash Landscape Scale Assessment Tool (LSAT) combines quantitative and qualitative techniques which are scaffolded by the Landscape Scale Threat Assessment and associated documentation. The LSAT is shown in Table 2 and uses elements of the Bayesian decision making model and Expert Judgment techniques backed by data. Bayesian decision making has been used where there is both objective and subjective data to analyse, and decisions need to be made on the probability of successful outcomes where there are high levels of uncertainty. Expert Judgement has been used in the assessment and determination of the landscape scale risk.

- Key considerations in our assessment have included:
- extent and continuity of vegetation
- topography
- prevailing winds
- the potential fire run and area that is likely to be impacted by the fire
- the impact on evacuation routes to safer places considering road networks, distances, and landscape factors
- the location and exposure of the development to bushfire
- the ability to seek bushfire shelter on site or at alternative locations
- the extent of neighbourhood-scale damage the bushfire may produce.

Landscape scale fires are those that can span many kilometres or tens of kilometres, and that burn for days or weeks at a time. Typically, these fires can be many thousands of hectares in size with fire fronts many kilometres in length. On the east coast of Australia this scale of fire is only possible where there are very large areas of forested vegetation, typically National Parks and State Forests that also adjoin substantial areas of private bushland.

There is no potential for a landscape scale fire to affect the site.

The narrow band of vegetation adjacent to the northwest has been authorised for development which will result in the removal of the small patch of remnant vegetation.

Land to the south and west has been predominantly cleared and consists of remnant Eucalyptus trees and grassland which at the time of inspection had been recently slashed. Depending on the management arrangements and ongoing management of the land to the south and west, there is potential for grassland fire to develop and impact the site. In time, land to the west and south will be developed for new residential areas.

The LSAT is heavily weighted to life safety and places significant emphasis on the ability for the future community to be able to shelter in place or evacuate safely, whilst emergency services can access the site at the same time. Table 1 Landscape Scale Assessment Tool.

When the individual factors are scored, after consideration of the landscape context, the site design complying with PBP, and the large urban area, the overall Landscape Scale Threat for the site is assessed as Low Risk. The summary and weighted scores are presented in Table 2 below.

Table 2 Landscape Scale Risk Assessment

Landscape Scale Assessment Tool					
Landscape scale bushfire risk factors					
Parameter	**Low landscape scale threat**	**Moderate landscape scale threat**	**High landscape scale threat**	**Extreme landscape scape threat**	
1. Surrounding Vegetation	Bushfire cannot directly approach the site as it is surrounded by urban development and non-mapped vegetation or managed land.	Bushfire can only approach from one aspect and the site is within a suburban, township or urban area considered managed land. Typically an island of bushfire vegetation within a wider urban development area or interface site impacted only by linear vegetation corridors of 100m width or less.	Bushfire can approach from more than one aspect and site is on the bushland-urban interface with the developed area considered as managed land. Typically contigous bushfire vegetation with a typical fire run in any direction of 0.1-2.0 km distance.	Bushfire can approach from more than one aspect and/or fires have many hours or days to grow and develop before impacting and/or site is surrounded by significant unmanaged vegetation. Typically large areas of contigous bushland with fire runs of more than 2 km possible.	**Moderate**
2. Bushfire Behaviour	Extreme bushfire behaviour at the site is not possible given the broader landscape.	Extreme bushfire behaviour at the site is unlikely in this broader landscape due to combination of factors of vegetation type, vegetation fragmentation, aspect and topography.	Extreme bushfire behaviour at the site is likely in this broader landscape due to combination of factors of vegetation type, vegetation fragmentation, aspect and topography.	Extreme bushfire behaviour is very likely in this broader landscape due to combination of factors of vegetation type, vegetation fragmentation, aspect and topography.	**Low**
3. Impact of severe fire behaviour (FFDI 80 or 100 as relevant) coming onto site from wider fire catchment	There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation) and will not result in neighbourhood scale destruction of the site.	The type and extent of vegetation beyond 150m from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to the site.	The type and extent of vegetation beyond 150m is likely to result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to the site.	The type and extent of vegetation beyond 150m will result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to the site.	**Low**
4. Vegetation Corridors	Vegetation within the site cannot enable fire to enter and move through the site by a continuous fire path from the primary fire source.	Vegetation within the site is unlikely to enable fire to enter and move through the site by a continuous fire path from the primary fire source.	Vegetation within the site may enable fire to enter and move through the site by a continuous fire path from the primary fire source.	Vegetation corridors on site provide for passage of fire to enter and move through the site from the primary fire source.	**Low**
5. Separation	Hazard separation between extreme bushfire hazard and buildings of greater than 100m. Extreme bushfire hazard does not include vegetated corridors of less than 100m width or grasslands.	Hazard separation between extreme bushfire hazard and buildings of 50-100m. Extreme bushfire hazard does not include vegetated corridors of less than 100m width or grasslands.	Hazard separation between extreme bushfire hazard and buildings of 20-50m. Extreme bushfire hazard does not include vegetated corridors of less than 100m width or grasslands.	Hazard separation between extreme bushfire hazard and buildings of <20m. Extreme bushfire hazard does not include vegetated corridors of less than 100m width or grasslands.	**Moderate**
6. Shelter	Immediate access is available to a place that provides shelter from bushfire. This includes existing or proposed buildings on site constructed in accordance with PBP.	Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area. In the case of an eco-tourist facility it will be the designated bushfire refuge built in accordance with PBP requirements.	Access to a place that provides shelter from bushfire is not certain during a wildfire and existing buildings are not built to PBP standards.	Access to a place that provides shelter from bushfire is not possible during a wildfire.	**Low**
7. Evacuation	Multiple evacuation routes are available and unlikely to be impacted by fire.	Evacuation to alternate location that provides life safety refuge is <1km and can be completed by foot or vehicle.	Evacuation to alternate location that provides life safety refuge is 1km-10km.	Evacuation to alternate location that provides life safety refuge is > 10km.	**Low**
8. Isolation and emergency services	Seamless integration with existing settlement - no impact on evacuation or access for emergency services.	Short bushland pinch points that may carry fire across roads and restrict access briefly during passage of fire. Unlikely impact on evacuation or access for emergency services.	Short bushland pinch points that are likely to carry fire across roads and restrict access temporarily. Likely impact on evacuation or access for emergency services.	Large areas of bushland or multiple pinch points that are likely to carry fire across roads in forest areas and will block evacuation or emergency service access routes for extended time.	**Moderate**
9. Firefighting water supplies	Site is within urban area and has access to reticulated water supply OR site has dedicated firefighting water supply in accordance with PBP requirements.	Site is on the periphery of urban area and has access to reticulated water supply that may be more susceptible to interuption.	Site is outside urban area and relies on an on site water supply not in accordance with PBP.	Site is in an isolated area and relies on an on site water supply not in accordance with PBP.	**Low**
		Overall Threat Rating	**Low Risk**	**Total**	120

11.2.Cumberland Bush Fire Risk Management Plan

The *Cumberland Bush Fire Management Committee Bush Fire Risk Management Plan 2021* (Risk Plan) does not identify the site or any surrounding areas at being of bushfire risk sufficient to warrant inclusion and consideration in the Risk Plan (Figure 4). This supports the site as being Low bushfire risk. Specifically, the Risk Plan does not identify any Asset Protection Zone (APZ), Strategic Fire Advantage Zone (SFAZ), Land Management Zone (LMZ) or Fire Exclusion Zone (FEZ) within proximity to the site.

Figure 4 Cumberland Bush Fire Management Committee Bush Fire Risk Management Plan 2021 (p. 33)

The site is Low landscape scale risk and is not considered a risk in the Risk Plan.

12. Site Specific Assessment

12.1. Methodology

PBP 2019 provides a methodology to determine the bushfire threat and commensurate size of any APZ that may be required to offset possible bushfire attack. These elements include the potential hazardous landscape that may affect the site and the effective slope within that hazardous vegetation.

The following assessment is prepared in accordance with Section 100B of the RF Act, Clause 44 of the RF Reg and PBP 2019. This assessment is based on the following resources:

- Planning for Bush Fire Protection (NSW RFS, 2019);
- Council Bushfire Prone Land Map;
- Aerial mapping; and
- Detailed GIS and Site analysis.
- Site inspection

The methodology used in this assessment is in accordance with PBP 2019 and is outlined in the following sections.

12.2. Bushfire Hazard

An assessment of the Bushfire Prone Land is necessary to determine the application of bushfire protection measures such as APZ locations and future building construction levels. The vegetation formations (bushfire fuels) and the topography (effective slope) combine to create the bushfire threat that may affect bushfire behavior at the site, and which determine the planning and building response of PBP 2019.

12.3. Fire Weather

The fire weather is dictated by PBP 2019 and assumes a credible worst-case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds. The site has a Fire Danger Index (FDI) of 100 as per PBP 2019.

12.4. Vegetation Assessment

The RF Regulation requires a classification of the vegetation on and surrounding the property (out to 140 metres from the boundaries of the property) in accordance with the system for classification of

vegetation contained in PBP 2019. Predominant vegetation is classified by structure or formation using the system adopted by Keith (2004) and by the general description using PBP 2019. Vegetation types give rise to radiant heat and fire behaviour characteristics. There are 7 vegetation formations (with sub-formations) identified in PBP 2019.

The predominant vegetation has been determined over a distance of at least 140 metres in all directions from the property boundary on the site. Where a mix of vegetation types exist, the type providing the greater hazard is said to predominate.

The surrounding locality is currently undergoing a rapid transformation from semi-rural land to residential development following its rezoning in 2016. The immediately surrounding land is described as follows:

- North: Land to the north includes existing semi-rural residential properties with some areas subdivided for future low density residential development. Land to the northwest includes a patch of remnant vegetation within 160 Cranbourne Street Rouse Hill 2155 (Lot 1/-/DP1290067) which has had a DA approved for residential development that will remove the patch of vegetation.
- East: Low density residential subdivision has occurred to the east of the site and accommodates recently constructed detached dwelling houses serviced by new roads. No hazard exists.
- West: Land to the west of the site is currently vacant however is subject to a proposed residential subdivision DA currently being prepared by Landcom. A road corridor to accommodate construction of Hambledon Road separates the proposed school site from the proposed residential development. Land to the west has been predominantly cleared and consists of remnant Eucalyptus trees and grassland which at the time of inspection had been recently slashed. More established residential areas are located further west of the site within the suburbs of Tallawong and Riverstone.
- South: Land to the south has been predominantly cleared and consists of remnant Eucalyptus trees grassland which at the time of inspection had been recently slashed. Further low-density residential subdivision has occurred to the south of the site. Further south of the site is the Tallawong Metro Station.

Figure 6 shows the vegetation within and surrounding the site has been extensively cleared and managed. Within the site, the mid story vegetation has been removed and trees have been thinned for agricultural practices. The ground story vegetation is regularly slashed and consists of grass with some shrubs. The vegetation formation and PCT is Cumberland Shale Plains Woodland (ID3320) as per NSW Government Trees Near Me. Vegetation within the site will be managed as an APZ.

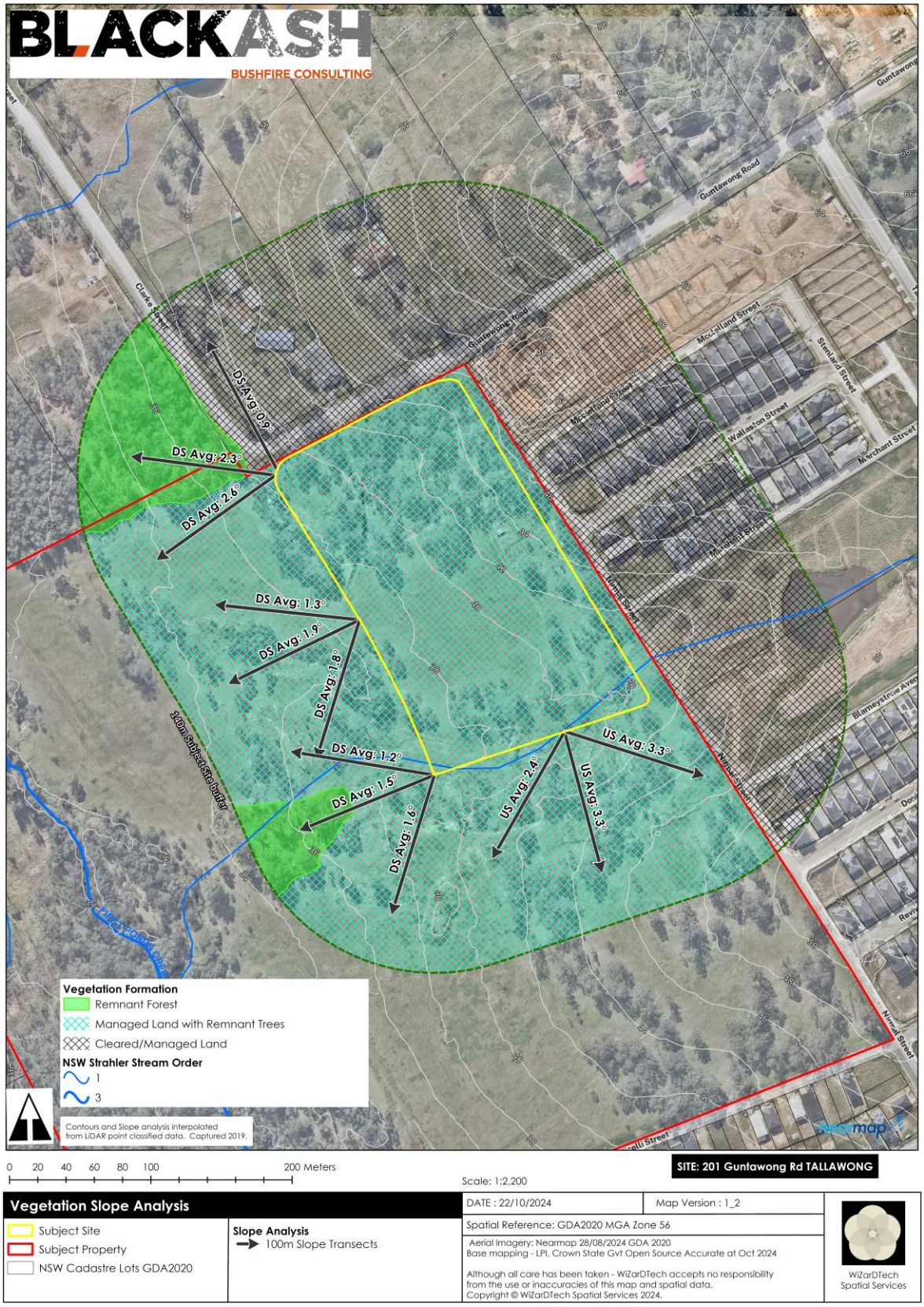

Figure 5 Nearmap Aerial Photograph of the site and surrounds showing cleared land within the site

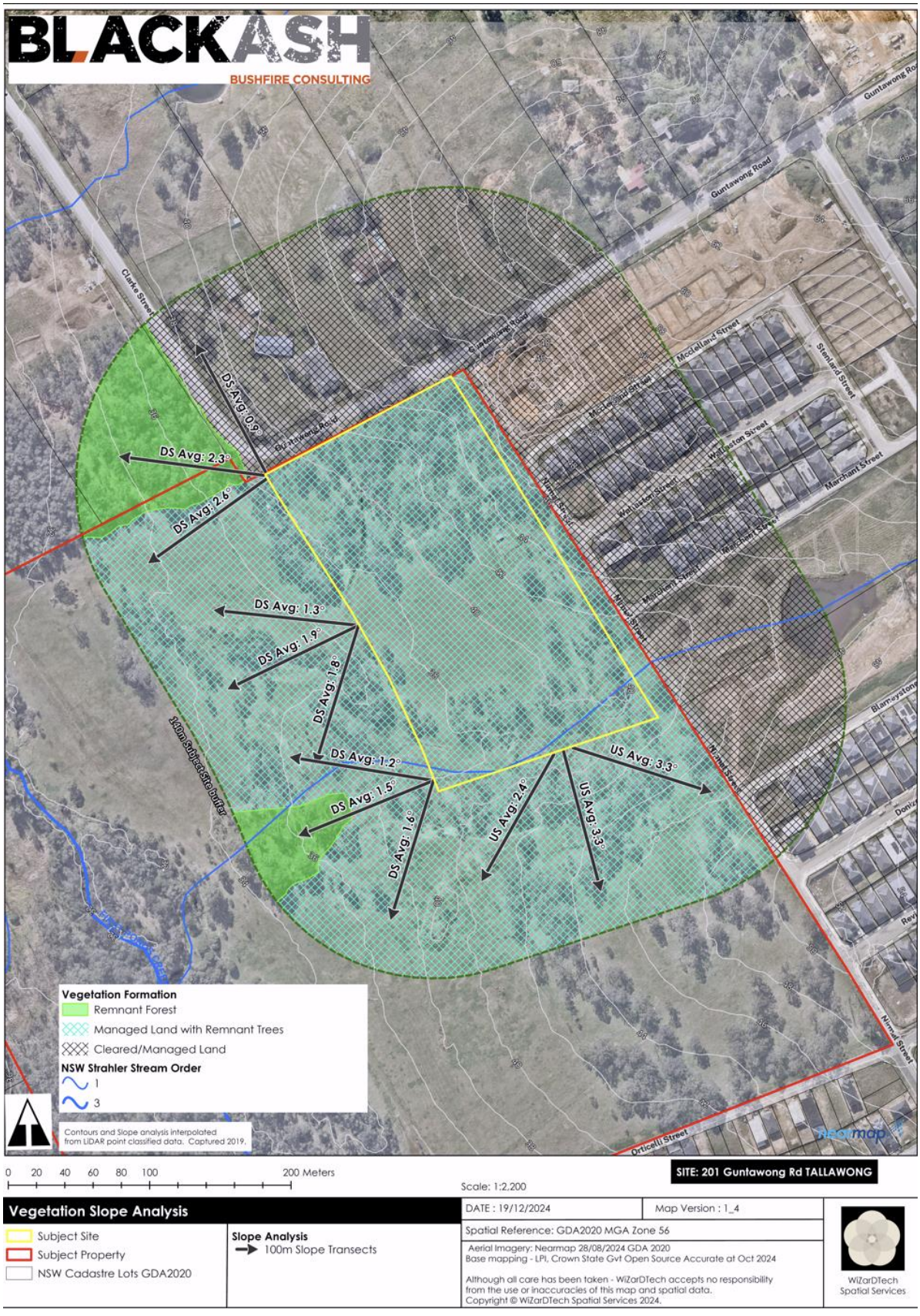

Figure 6 Vegetation PCT (source Trees Near Me)

12.5. Slopes Influencing Bushfire Behaviour

The RF Reg requires an assessment of the slope of the land on and surrounding the property (out to 100 metres from the boundaries of the property or from the proposed development footprint).

The effective slope' influencing fire behavior approaching the sites has been assessed in accordance with the methodology specified within PBP 2019. The effective slope is the slope of the ground under the hazard (vegetation). It is not the slope between the vegetation and the building (slope located between the asset and vegetation is the site slope).

The slopes are between 4.0° and 2.8° downslope to the riparian centre line. Slopes are shown in Figure 6 and are in the 0-5° downslope category in accordance with PBP 2019.

12.6.Asset Protection Zones

An APZ is a fuel-reduced area surrounding a built asset or structure which provides a buffer zone between a bushfire hazard and an asset. The APZ includes a defendable space within which firefighting operations can be carried out. An APZ is land that has vegetation removed or maintained to a level that limits the spread and impact of bushfire. This may include:

- developed land (residential, commercial, or industrial),
- permanent roads, bike paths, parking areas,
- golf course fairways, playgrounds, sports fields,
- vineyards, orchards, cultivated ornamental gardens and commercial nurseries,
- most common will be gardens and lawns within curtilage of buildings.

For new SFPP developments, the APZ requirements must result in radiant heat levels at new buildings being below 10kW/m². The acceptable solution APZs are:

Table 3 Acceptable Solution APZs

Aspect	Vegetation	Slope	SFPP Acceptable Solution APZ	Comment
North	Grassland	Upslope and flat	36m	APZ can be accommodated within public road infrastructure and the subject

				land. Buildings are not impacted.
East	Managed land	NA	NA	Residential development. No hazard.
South	Grassy Woodland	0° - 5° downslope	50m	APZ can be achieved within the site.
West	Grassy Woodland	0° - 5° downslope	50m	APZ can be achieved within the site.

Based on woodland vegetation to the west and south and grassland to the north, the acceptable solution APZs are shown in Figure 7. The grassland APZ to the north extents over Guntawong Road which is managed land. The APZ to the north does not extent into adjoining residential properties and does not burden Council with any management responsibility for APZ maintenance within the broad as it is non combustible and the road verges are managed.

APZ to the west is based on woodland vegetation and is predominantly contained within the site (Figure 7). Small areas of APZ extent into adjoining land to the west and south. The DoE have advised Blackash that the APZ easement agreement is already in progress with OSL and is a temporary measure until the area is developed.

NCC 2022 provides requirements for acceptable solutions to new schools in Bushfire Prone Areas or for land which may be subject to bushfire attack. It is a requirement that land within the site is managed as an Inner Protection Area in accordance with PBP 2019. Specification 43 is applicable to schools within 100m of forest and woodland and 50m for grassland areas. Figure 8 shows the NCC minimum distance of management from school buildings and Figure 98 shows the NCC minimum distance of management from school boundary. If land can be managed greater than the minimum distance is Figure 8 or Figure 9, Specification 43 would not apply to the buildings. The DoE have advised Blackash that the APZ easement agreement is already in progress with OSL and is a temporary measure until the area is developed.

If the APZ cannot be provided in accordance with Figure 8 or Figure 9, compliance with Specification 43 would be required as the land should be classified as Vegetation Category 2 Bushfire Prone Land.

The compliance of the proposed APZ within Section 6.8.1 of PBP is in Table 4.

Table 4 APZ Compliance

Intent of Measures **PBP Table 6.8a** **APZ**	*to provide suitable building design, construction and sufficient space to ensure that radiant heat levels do not exceed critical limits for firefighters and other emergency services personnel undertaking operations, including supporting or evacuating occupants.*	
Performance Criteria	**Acceptable Solution**	**Compliance**
Radiant heat levels of greater than 10kW/m² (calculated at 1200K) will not be experienced on any part of the building.	*the building is provided with an APZ in accordance with Table A1.12.1 in Appendix 1.*	**Complies** APZ provided in accordance with Table A1.12.1 of PBP The extent of the APZ is as per Figure 7.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	*APZs are located on lands with a slope less than 18 degrees.*	**Complies** APZ is not located on slopes greater than 18°.
APZs are managed and maintained to prevent the spread of fire to the building. *the APZ is provided in perpetuity.*	*the APZ is managed in accordance with the requirements of Appendix 4 of this document, and is wholly within the boundaries of the development site;* *APZ are wholly within the boundaries of the development site; and*	**Complies** APZ provided in accordance with Table A1.12.1 of PBP The extent of the APZ is as per Figure 7

	other structures located within the APZ need to be located further than 6m from the refuge building.	

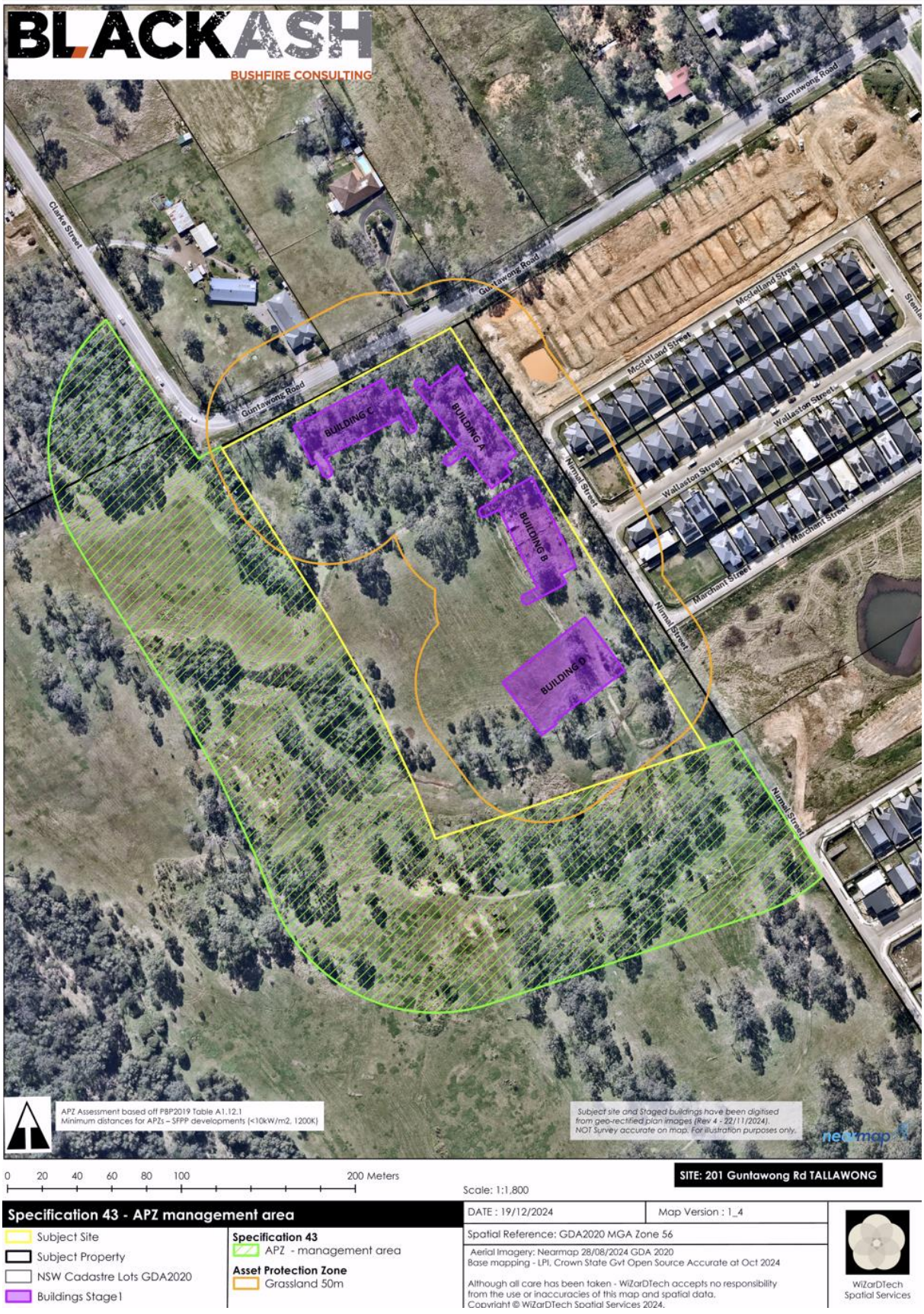

Figure 7 APZ from site boundary to be exempt from Specification 43

12.7.Construction and Bushfire Attack Levels

The Bushfire Attack Level or BAL is a means of measuring the severity of a building's potential exposure to ember attack, from 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. The BAL levels are shown in Table 5.

Table 5 Bushfire Attack Levels and Bushfire Attack

BAL	1Heat flux threshold (kW/m^2)	Predicted bushfire attack and level of exposure
BAL-12.5	≤ 12.5	Significant ember attack, burning debris and radiant heat up to a level of 12.5 kW/m2.
BAL-19	12.5 – 19	Increasing levels of ember attack, burning debris and radiant heat up to a level of 19 kW/m2.
BAL-29	19 – 29	Increasing levels of ember attack, burning debris and radiant heat up to a level of 29 kW/m2.
BAL-40	29 – 40	Increasing levels of ember attack, burning debris and radiant heat up to a level of 40 kW/m2. Flames from the bushfire front may intermittently contact the building.
BAL-FZ	≥ 40	Increasing levels of ember attack, burning debris and radiant heat in excess of 40 kW/m2. Flames from the bushfire front are likely to engulf part or all of the building.

The BAL is determined in accordance with Appendix 1 of PBP 2019 or the site assessment methodology within AS3959. Both approaches are the same and rely on an assessment of vegetation and slope with the separation of ab building to determine the BAL. The BAL for the site is shown in Figure 10.

BAL ratings range from BAL-LOW, indicating minimal risk, to BAL-FZ (Flame Zone), where buildings are at the highest risk. These ratings guide building construction standards, helping to improve fire resilience and occupant safety. Based on management of the site as an asset protection zone, all buildings within the site are BAL 12.5 or lower (see Figure 10). However, the determination of the APZ will influence the BAL. The DoE have advised Blackash that the APZ easement agreement is already in progress with OSL and is a temporary measure until the area is developed. Construction compliance is at Table 6.

Table 6 Compliance Construction

Intent of Measures **PBP Table 6.8a** **Construction**	*to provide suitable building design, construction and sufficient space to ensure that radiant heat levels do not exceed critical limits for firefighters and other emergency services personnel undertaking operations, including supporting or evacuating occupants.*	
Performance Criteria	**Acceptable Solution**	**Compliance**
the proposed building can withstand bush fire attack in the form of wind, embers, radiant heat and flame contact.	*landscaping is in accordance with Appendix 4; and fencing is constructed in accordance with section 7.6.*	**Complies** APZ provided in accordance with Table A1.12.1 of PBP The extent of the APZ is as per Figure 7. This will determine BAL. Indicative BAL has been provided at Figure 8 with the entire site managed as an APZ. With the offsite APZ, no BAL is applicable to the buildings.

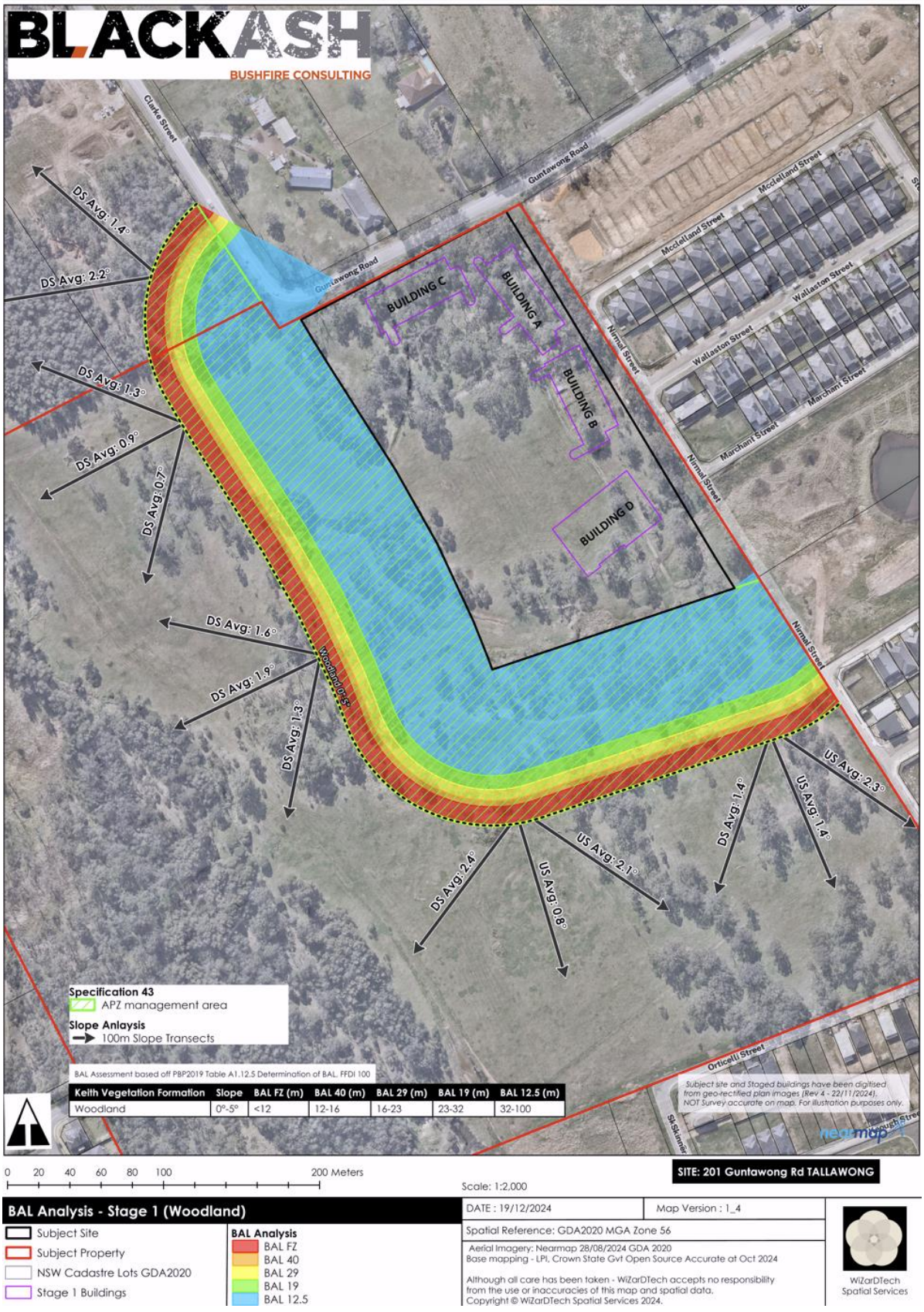

Figure 8 Bushfire Attack Level from site boundary

12.8.Water Supplies

The site will be adequately supplied by installed water services associated with the existing developed areas. The site is services by reticulated water mains. Water compliance is at Table 7.

Table 7 Water Compliance

Intent of Measures **PBP Table 6.8c** **Water Supply**	*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.*	
Performance Criteria	**Acceptable Solution**	**Compliance**
An adequate water supply for firefighting purposes is installed and maintained	*reticulated water is to be provided to the development, where available*	**Complies** Activity serviced by reticulated water supply.
water supplies are located at regular intervals. the water supply is accessible and reliable for firefighting operations.	*fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005; hydrants are not located within any road carriageway; and reticulated water supply to SFPPs uses a ring main system for areas with perimeter roads.*	**To Comply** Fire hydrants will be designed and installed in accordance with AS2419:2021.
flows and pressure are appropriate	*fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005*	**To Comply** Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005
the integrity of the water supply is maintained.	*all above-ground water service pipes external to the building*	**To Comply**

	are metal, including and up to any taps.	All above-ground water service pipes external to the building are metal, including and up to any taps.
water supplies are adequate in areas where reticulated water is not available	NA	**To Comply** Mains water available

12.9.Gas and electrical supplies

The site is adequately supplied by services. Any gas services installed should be maintained in accordance with *Australian Standard AS/NZS 1596 'The storage and handling of LP Gas'* (Standards Australia 2008) and Table 8.

Table 8 Gas & Electricity Compliance

Intent of Measures **PBP Table 6.8c** **Gas and Electrical Supply**	*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.*	
Performance Criteria	**Acceptable Solution**	**Compliance**
location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	*where practicable, electrical transmission lines are underground*	**To Comply**
location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	• *reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used;* • *all fixed gas cylinders are kept clear of all flammable*	**To Comply**

	materials to a distance of 10m and shielded on the hazard side; • *connections to and from gas cylinders are metal; if gas cylinders need to be kept close to the building, safety valves are directed away from the building and at least 2m away from any combustible material, so they do not act as a catalyst to combustion;* • *polymer-sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used; and* • *above-ground gas service pipes external to the building are metal, including and up to any outlets*	

12.10. Access

As the site meets the access requirements of PBP 2019 and the buildings are beyond the distance required for any Bushfire Attack Level considerations (The DoE have advised Blackash that the APZ easement agreement is already in progress with OSL and is a temporary measure until the area is developed), it is not deemed necessary to comply with the access provision of a perimeter road around each building in accordance with the acceptable solutions of PBP. Assessment of the design is documented in Table 9 as a performance solution.

Table 9 Access Compliance

Intent of Measures **PBP Table 6.8.2** **Gas and Electrical Supply**	*To provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area.*
Performance Criteria	**Compliance**
firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	**Complies** The school is served by Nirmal Road to the east and the feeder roads of McLelland Street, Wallaston Street and Marchant Street. The site will have two main access points along Nirmal Street which includes the carpark to the south of the site. This is available to MR vehicles. Two pedestrian access points are provided into the school grounds from the east. Guntawong Road is to the north of the site and a bus stopping area is provided adjacent to Building C that provides hardstand areas for fire appliances from the north if necessary. Two pedestrian access points are provided into the school grounds from the north. Future expansion of Hambledon Road is proposed to the west of the site that is associated with residential release areas. A pedestrian pathway is to the west of the school buildings within the site that facilitates access by emergency services. A gate is available off the corner of Clarke Street to the grassland areas to the west of the site. All buildings can be accessed via the existing external public road infrastructure and managed areas within the site. Additional internal vehicular access is not necessary. To ensure a safe operational environment for firefighting personnel, the landscaping within the site will be designed and managed in accordance with acceptable solutions of PBP as identified in Table 10.

	The external (within the site) and internal (within the buildings) fire hydrants will be designed and installed in accordance with AS2419:2021 requirements.

12.11. Landscaping

The site is to be managed to Inner Protection Area Standards. This complies with PBP 2019. Landscaping compliance is at Table 10.

Table 10 Landscaping Compliance

Intent of Measures **PBP Table 6.8a** **Landscaping**	*landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.*	
Performance Criteria	**Acceptable Solution**	**Compliance**
landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	*landscaping is in accordance with Appendix 4; and* *fencing is constructed in accordance with section 7.6.*	**To Comply** landscaping is to be in accordance with Appendix 4 Landscaping will be designed and managed in accordance with Appendix 4 of PBP (Appendix A).

12.12.Emergency Management Arrangements

PBP 2019 and the RFS require the preparation of a '*Bushfire Emergency Management and Evacuation Plan*' prior to occupation of new schools. Prior to occupation, a Plan is to be prepared in accordance with the NSW Rural Fire Service document '*A Guide to Developing a Bushfire Emergency Management and Evacuation Plan*' (RFS 2014). Emergency management compliance is at Table 11.

Table 11 Emergency Management Compliance

Intent of Measures **PBP Table 6.8d** **Emergency Management Planning**	*To provide suitable emergency and evacuation arrangements for occupants of SFPP developments.*	
Performance Criteria	**Acceptable Solution**	**Compliance**
Bush Fire Emergency Management and Evacuation Plan is prepared	*Bush Fire Emergency Management and Evacuation Plan is prepared consistent with the: The NSW RFS document: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan;* *NSW RFS Schools Program Guide;* *Australian Standard AS 3745:2010 Planning for emergencies in facilities; and Australian Standard AS 4083:2010 Planning for emergencies – Health care facilities (where applicable).*	**To Comply**
	the Bush Fire Emergency Management and Evacuation Plan should include planning for	**To Comply**

	the early relocation of occupants.	
	A copy of the Bush Fire Emergency Management and Evacuation Plan should be provided to the Local Emergency Management Committee for its information prior to occupation of the development.	**To Comply**

12.13.Specification 43 requirements

The school buildings are not within land affected by land that can support a bushfire or is likely to be subject to bushfire attack and as such, Specification 43 is not applicable to the school buildings. There are no requirements for the provision of Specification 43.

13. Risk Based Approach

Considering the site's low bushfire risk (see Section 12), requiring full compliance with Specification 43 may be seen as unnecessarily cautious, leading to additional costs that could outweigh the actual benefits in risk reduction. By tailoring compliance requirements more closely to the specific risk level of the site, resources could be better allocated, potentially reducing project expenses while still maintaining adequate safety standards. Adjusting the approach to performance based assessment and compliance in light of the low-risk context allows for a balanced response that upholds both safety and cost-efficiency. This would need to be tested within DoE for risk tolerance and cost benefit.

Such an approach would be based on the provision of compliance APZs and solid bushfire emergency management arrangements through a binding Bushfire Management and Evacuation Plan that would close the site on Catastrophic Fire Danger days or if fires are in the vicinity of the site.

14. Mitigation Measures

Mitigation measures are essential components of this Bushfire Assessment Report, aimed at assessing bushfire risk to the site and future occupants and reducing or eliminating potential environmental impacts associated with the proposed activity. These measures have been carefully developed based on rigorous bushfire assessments, applicable legislation, and the requirements of PBP 2019 to ensure bushfire protection while balancing protection of the environment and risk mitigation. By implementing these mitigation measures, the project seeks to address identified risks, enhance bushfire and environmental outcomes, and promote sustainable development practices, ensuring compliance with bushfire regulatory requirements and alignment with broader environmental objectives.

The following mitigation measures in Table 12 have been made within this report to ensure the activity is compliant with the NSW and national framework for bushfire mitigation.

The school buildings are not within designated Bushfire Prone Land or is likely to be subject to bushfire attack (building are separated by 50m for grassland and 100m for woodland) and as such, Specification 43 is not applicable to the school buildings or within the site. There are no requirements for the provision of Specification 43.

Table 12 Mitigation Measures

Project No.	Project Stage Design Construction Operation	Mitigation Name	Mitigation Measure	Reason for Mitigation Measure
1.	Design Construction Operation	**Asset Protection Zone**	Table 4 and shown in Figure 3. Identified APZ to be maintained in perpetuity or until surrounding land is developed to the specifications detailed in Appendix 2. The extent of the APZ is as per Figure 7 This will determine BAL. Indicative BAL has been provided at Figure 10 with the entire site managed as an APZ. The site is to be managed to Inner Protection Area Standards to the specifications detailed in Appendix 2. See Table 4.	Afford buildings and their occupants protection from exposure to a bushfire. Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
2.	Design Construction Operation	**Construction**	Prior to occupation, DoE are to ensure the buildings are designed and constructed to the relevant NCC requirements including **BAL-19** in accordance with AS 3959-2018 and additional ember provisions detailed in section 7.5 of PBP as required. See Table 6.	The proposed building can withstand bushfire attack in the form of wind, embers, radiant heat and flame contact.

Project No.	Project Stage Design Construction Operation	Mitigation Name	Mitigation Measure	Reason for Mitigation Measure
3.	Design Construction Operation	**Landscaping**	Landscaping will be designed and managed in accordance with Appendix 4 of PBP (Appendix 2) See Table 10.	Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
4.	Design Construction Operation	**Access**	Performance solution addresses PBP requirements. See Table 9.	To ensure that appropriate operational access and egress for emergency service personnel and occupants is available.
5.	Design Construction Operation	**Services** **Water, Gas, Electricity**	Fire hydrants are provided in accordance with AS2419:2021 See Table 7 No response required as electricity supply located underground. See Table 8. Gas services (if installed) are installed and maintained in accordance with AS/NZS 1596:2014. See Table 8.	To ensure that utility services are adequate to meet the needs of firefighters.

Project No.	Project Stage Design Construction Operation	Mitigation Name	Mitigation Measure	Reason for Mitigation Measure
6.	Operation	**Emergency Management Arrangements**	Prior to occupation, a Bushfire Emergency Management and Evacuation Plan is to be prepared in accordance with the NSW Rural Fire Service document 'A Guide to Developing a Bushfire Emergency Management and Evacuation Plan' (RFS 2014). See Table 11.	To ensure emergency evacuation procedures and management which provides for the special characteristics and needs of occupants

15. Evaluation of Environmental Impacts

The environmental impacts of the proposed activity have been systematically evaluated in this Bushfire Assessment Report to identify potential bushfire risks and ensure compliance with applicable bushfire legislation and standards. This assessment considers the site specific conditions that relate to the provision of bushfire requirements such as the provision of asset protection zones. This assessment has not considered the environmental impact of providing managed areas to reduce fire impact. However, the existing management practices provide for managed areas that would continue to be managed for the duration of the school or until adjoining lands were developed and any risk was removed.

This evaluation supports informed decision-making and demonstrates a commitment to environmentally responsible practices throughout the project's lifecycle.

From a bushfire risk and mitigation perspective:

1. The extent and nature of potential impacts are low and will not have significant impact on the locality, community and/or the environment.
2. Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the locality, community and/or the environment.
3. Bushfire risk can be adequately mitigated through recommended measures.
4. Bushfire risk is not considered to be a significant impact.

16. Conclusion

This assessment has demonstrated that the proposed new school is able to meet the requirements of *Planning for Bushfire Protection 2019*. Recommendations have been provided that are required to mitigate bushfire to tolerable levels in accordance with *Planning for Bushfire Protection 2019*.

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

Lew Short | Director
B.A., Grad. Dip. (Design for Bushfires), Grad. Cert. of Management (Macq), Grad. Cert. (Applied Management)

Appendix 1: References

Councils of Standards Australia AS3959 (2009) – *Australian Standard Construction of buildings in bushfire-prone areas*

Councils of Standards Australia AS2419 (200) – *Fire Hydrant Installations*

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

NSW Rural Fire Service (2015) *Guide for Bushfire Prone Land Mapping*

NSW Rural Fire Service (2019). *Planning for Bushfire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.* Draft for Public Exhibition

NSW Government (1979) *Environmental Planning and Assessment Act 1979*. NSW Government Printer.

Appendix 2 APZ Standards (source PBP p. 107)

A4.1.1 Inner Protection Areas (IPAs)

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

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

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

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

A4.1.2 Outer Protection Areas (OPAs)

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

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

When establishing and maintaining an OPA the following requirements apply:

Trees

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

Shrubs

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

Grass

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

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

Attachment 1 Curriculum Vitae

BLACKASH
BUSHFIRE CONSULTING

Curriculum Vitae

Lew Short
Director BlackAsh Bushfire Consulting
T: 0419 203 853 E: lew.short@blackash.com.au

Summary
Lew is an experienced leader in the government and emergency sector. He has an intimate knowledge of the workings of government and how emergency service organisations operate. He is not only a technical expert but a practitioner who has deep industry knowledge.

Lew has extensive experience providing national leadership in building community resilience representing AFAC and the FPAA. Lew's technical expertise is in bushfire consequence management, risk assessment and mitigation, specifically the planning and design of new developments in high bushfire risk areas to comply with legislative and planning requirements.

Lew has worked with some of Australia's leading organisations including NSW Rural Fire Service, Country Fire Authority, Emergency Management Victoria, Lend Lease, Mirvac, Victorian State and Local Governments, Sydney Water Corporation, Great Lakes and Warringah Councils. Lew has completed numerous industrial development assessments and assessments of new development in rural areas NSW.

Lew has a deep operational understanding of how fire works in the Australian landscape. He has multifaceted insight into how governments respond to this threat. Lew provides unique strategies to comply with regulatory requirements and safety outcomes.

Lew established and led the Community Resilience Group for the New South Wales Rural Fire Service (RFS). His areas of responsibility included land use planning, community engagement, education, vulnerable communities, bunkers, Neighbourhood Safer Places, business systems and projects, social media, integrated risk management and environmental management. He was responsible for the establishment, management and leadership of the development assessment function for the RFS at a State level where he was responsible for the assessment of over 80,000 development applications in Bush Fire Prone Areas.

Areas of Expertise

- Rezoning and strategic studies
- Industrial development assessment
- Landuse planning & consequence management
- Legal strategy, Land & Environment Court and Expert Witness
- Bushfire planning, design & construction requirements in accordance with National Standards
- Bushfire Prone Mapping, hazard mapping and risk assessments
- Australian Standard AS3959 Construction of Buildings in Bushfire Prone Areas
- Bushfire Management Plans
- Alternative & performance based solutions
- Evacuation planning and implementation
- Technical and Strategic advice

Qualifications / Accreditation

BPAD Level 3 Accredited Practitioner
Fire Protection Association of Australia

Graduate Diploma of Bush Fire Design
University of Western Sydney, 2006

Graduate Certificate of Applied Management
Australian Institute of Police Management, 2005

Graduate Certificate of Management Macquarie
Graduate School of Management Macquarie University, 2001

Bachelor of Arts, Resource and Environmental Management
Macquarie University, 1994