



REPORT

# Bush Fire Hazard Assessment and Management Plan

PREPARED FOR  
PACE FARM PTY LTD

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## QUALITY STATEMENT

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It is acknowledged and agreed that the site may be subject to a degree of bushfire hazard. The client acknowledges and agrees that Meridian Urban has not created or contributed to the creation or existence of this hazard and the Client indemnifies Meridian Urban for claims arising out of or resulting from a bushfire event except to the extent attributable to the negligence of Meridian Urban.

The Client agrees that the Consultant shall have no liability in respect of any damage or loss incurred as a result of bushfire.

## Pace Farm Pty Ltd

# Bush Fire Hazard Assessment and Management Plan

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# 1 Introduction

This Bush Fire Hazard Assessment and Management Plan (BFHAMP) report is commissioned by PSA Consulting on behalf of Pace Farm Pty Ltd in support of a development application under the *Environment Planning and Assessment (EP&A Act) 1979* for intensive livestock agriculture (poultry farm) in Warrah Ridge (Layer Farm 1095). The subject site is formally described as part Lot 52 on DP1168698, Lot 170 and 171 on DP751033 and Lot 1 on DP576340 within the Shire of Liverpool Plains. This report provides an assessment of compliance of the proposed development in accordance with Section 2.4.4 of *Planning for Bush Fire Protection (PBP) 2019* in relation to potential bush and grass fire hazard.

This assessment focuses on the compliance of the proposed development with regard to relevant bush fire protection provisions, policy and legislation including the Liverpool Plains Local Environmental Plan (LEP) and Development Control Plan (DCP), PBP 2019, the *Rural Fires Act 1997* and the EP&A Act. The report also has regard to other instruments including the National Construction Code and Building Code of Australia, and as AS3959-2018 – Construction of Buildings in Bushfire Prone Areas which outlines the national building construction specifications for land situated within bush fire prone areas, or alternatively the NASH Standard of Steel Framed Construction in Bushfire Areas.

This BFHAMP is prepared by a qualified and experienced BPAD Level 3 practitioner (No. 33131).

The focus of this assessment report remains two-fold, both with respect to the statutory planning and building requirements as they apply in this case pursuant to all relevant policies, standards and regulation, and also end-user consideration and the protection of the operation. This report identifies the hazard profile relevant to the subject site and provides recommendations for a range of mitigation measures which seek to limit exposure of the development to an appropriate level.

This assessment report aims to mitigate the risk of bush fire threat and the impact of bush fire attack which includes:

- direct flame contact
- ember and firebrand attack
- radiant heat
- fire-driven wind.

Building loss is typically associated with one or more forms of bush fire attack, the most common being the combined effects of radiant heat and ember attack. Danger to human and animal life is also associated with these forms of bush fire attack, in addition to smoke emission.

This assessment does not seek to remove the threat of bush fire risk, but provide detailed siting, layout, building and / or servicing information to assist in guiding combined efforts to manage the potential threat of this risk.

## 1.1 Summary of site details

<b>Site Address</b>	Warrah Ridge Road, WARRAH RIDGE (Layer Farm 1095)
<b>RP Description</b>	Lot 52 on DP1168698 (Part) Lot 170 on DP751033 (Part) Lot 171 on DP751033 (Part) Lot 1 on DP576340 (Part)
<b>Site Area</b>	179ha approx.
<b>Local Government</b>	Liverpool Plains
<b>LEP</b>	Liverpool Plains Local Environment Plan 2011 Liverpool Plains Shire Council Development Control Plan 2012
<b>Zoning</b>	RU1
<b>Tenure</b>	Freehold
<b>Current Land Use</b>	Rural
<b>Proposed Land Use</b>	Intensive livestock agriculture (poultry farm)
<b>Fire Authority</b>	Quirindi; Willow Tree

## 2 Site and Locality Context

The subject site is located to the east of Inverkip Road and south of Warrah Ridge Road in Warrah Ridge. Measuring approximately 179 hectares, the land is currently used for livestock grazing and cropping. The subject site traverses four (4) part lots, however this report only incorporates those allotment parts which are relevant to the proposed development as detailed in Figure 1.

The land rises from west to east, with the Warrah Range traversing the eastern extent of the site. The land is largely cleared and comprises grasslands with scattered and isolated areas of grassy woodlands. The lots are improved by several small dams, contour benches and access tracks.

Surrounding land uses are also rural in nature. Further to the west is Big Jacks Creek which flows to the north-west into Warrah Creek. Land to the west of Inverkip Road is highly fertile and largely used for cropping, as is the case to the north and east.

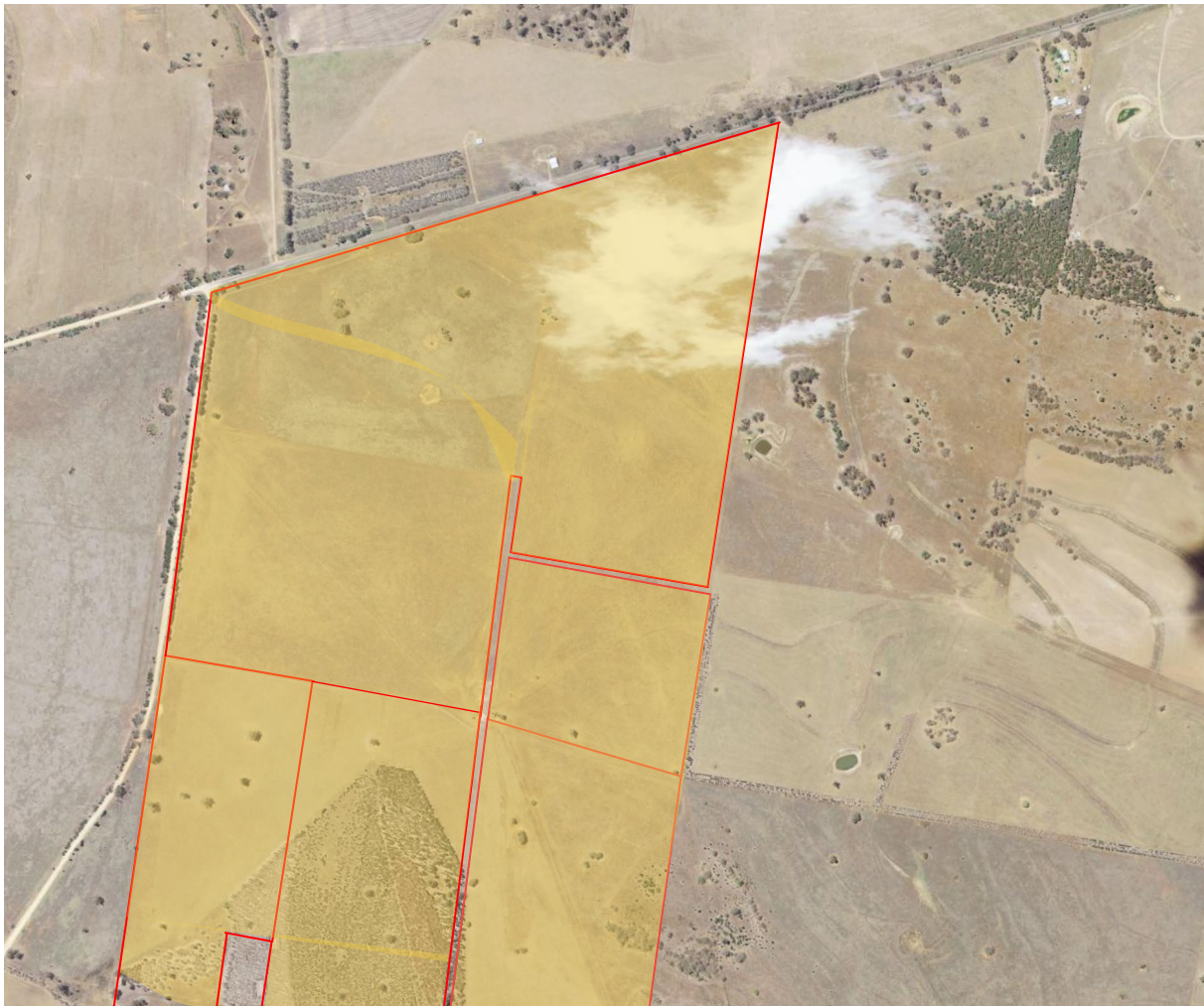


Figure 1: Site locality and context (Source: NSW Government)

### 3 Proposed Development

The proposed development involves an intensive livestock agriculture use for the purposes of a new poultry farm comprising eight (8) laying sheds across two (2) locations, with a combined maximum capacity of 248,000 birds (31,000 birds per shed).

Access servicing the farm is proposed from Warrah Ridge Road, with a six (6) metre internal driveway providing access and egress. A proposed farm managers residence is situated toward the Warrah Ridge Road frontage of the site.

The internal access driveway will service the manager residence as well as eight (8) laying sheds, divided across two locations. The first group of four (4) sheds is situated approximately 270m from the Warrah Ridge Road frontage, and approximately 500m from Inverkip Road. The internal access driveway continues 500 metres south to provide access for the second group of four (4) laying sheds. These sheds are located approximately 450 metres from Inverkip Road. A vehicle turnaround is also provided for articulated vehicles.

Access road adjacent to the sheds widen to approximately 9 metres.

Along the central access road is a proposed service building along with two (2) 1 megalitre steel water tanks.

The laying sheds on site are proposed to be constructed of fire-resistant materials including Colorbond metal deck roofs, wall cladding constructed of Colorbond (amenities building), PIR panels (layer sheds and services building) and a combination of concrete and Colorbond (compost building). PIR panels are insulated wall panels which are also fire resistant.

Design details for the manager's residence are not currently available. On this basis, this assessment measures asset protection and bush fire attack level measurements from the proposed boundary of the proposed manager's residence.

Refer to the proposed site plan below (Figure 2).



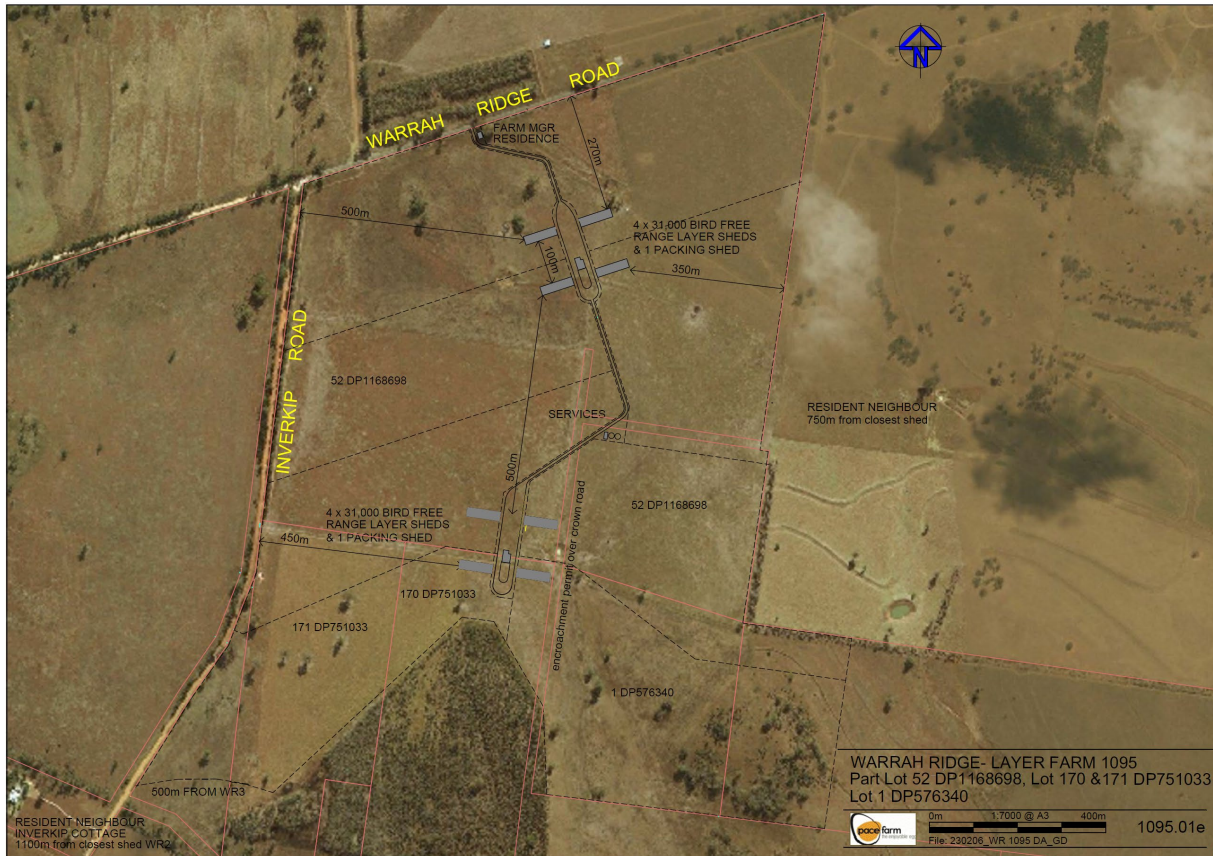


Figure 2: Proposed site layout (Source: Pace Farm Pty Ltd)

## 4 Bush Fire Prone Land Designation

Properties that are considered to be at risk of potential bush fire attack are identified by the local bush fire prone land map which is generally prepared by local government and endorsed by the Commissioner of the NSW RFS.

The NSW Government ePlanning Spatial Viewer provides the relevant bush fire prone land map for Liverpool Plains, which identifies the subject land as both Category 1 and 3 Vegetation. Though, the land on which the development is proposed is only within Vegetation Category 3. This layer constitutes 'medium' bush fire risk and consists of grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands. Areas of Category 1 Vegetation directly are present in the southern extent of the site, approximately 100m from the southern laying sheds.

In the case of the subject site, grasslands is the dominant vegetation community.

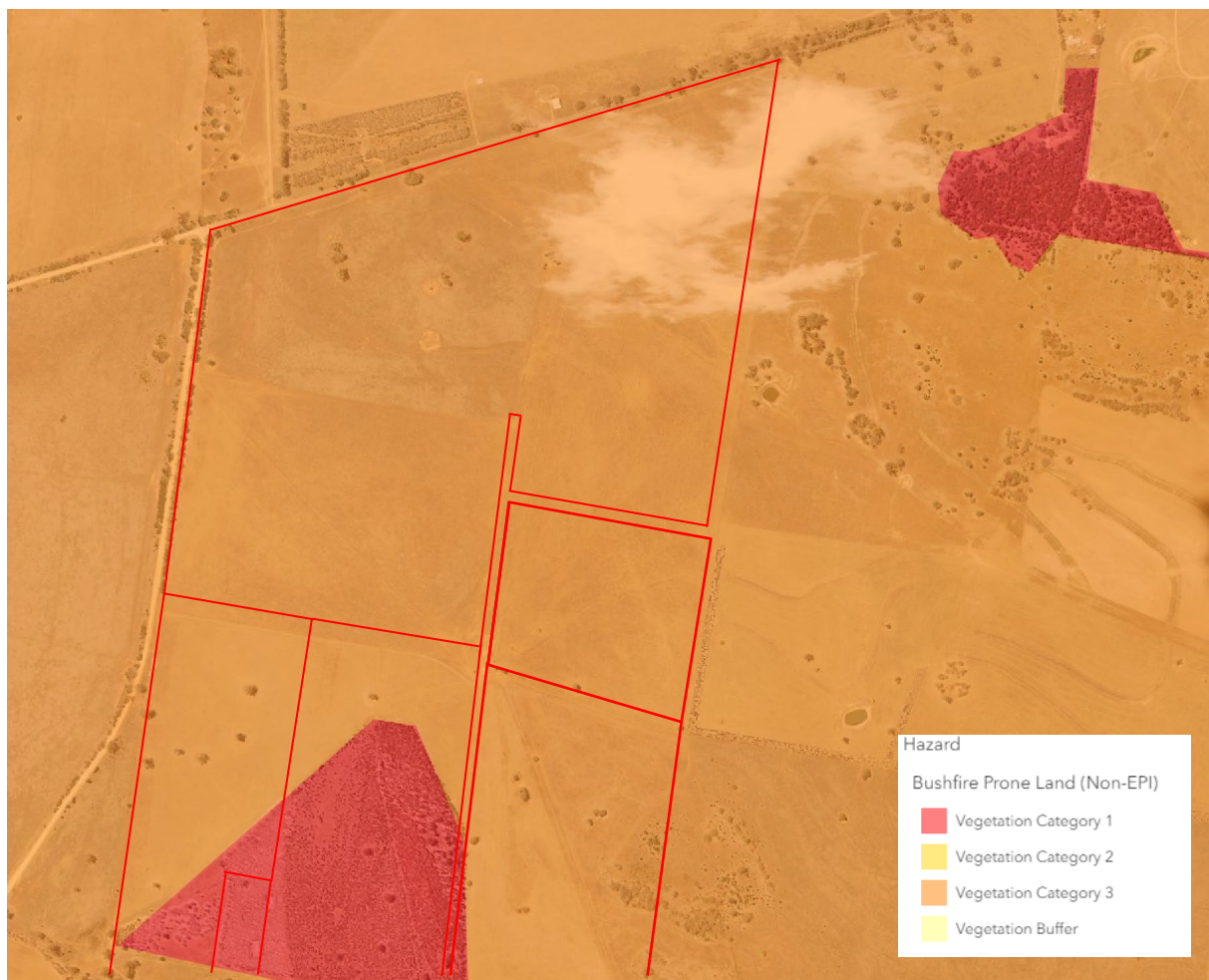


Figure 3: Bushfire Prone Land Assessment (Source: NSW Planning Portal, 2023)

## 5 Regulatory and assessment context

The following section outlines the relevant regulatory and statutory context relevant to the proposed development.

### 5.1 Farm managers residence component

One (1) farm manager's residential dwelling is proposed to immediate south of Warrah Ridge Road. Details regarding the design and construction of this dwelling are not currently available. As such, asset protection and bush fire attack level measurements are taken from the boundary surrounding this dwelling for the purposes of this assessment. The dwelling is be surrounded by Vegetation Category 3 (as show in Figure 3) as well as an extent of vegetation on the opposite side of Warrah Ridge Road classified as Category 1 vegetation (which is not mapped). Pursuant to PBP 2019, bushfire protection measures for residential dwellings include Asset Protection Zones (APZs) / Bush Fire Attack Level (BAL) construction, installation of utilities that include water supply for fire-fighting, landscaping provisions, and access requirements.

### 5.2 Poultry operation

The proposed development, being an intensive livestock agriculture use for the purposes of a poultry farm operation, constitutes 'other development' as per Section 8.3 of PBP 2019. Section 8.3 specifies a range of provisions for a breadth of land uses. Development for the purposes of intensive livestock agriculture is identified as 'other non-residential development' and provisions for buildings of class 5 to 8 under the National Construction Code (NCC) are outlined.

The NCC itself does not prescribe any bush fire specific performance requirements for these classes of buildings and as such, neither AS 3959-2019 or the NASH Standard are considered to constitute deemed to satisfy provisions. Notwithstanding, PBP 2019 prescribes that compliance with either AS3959 or the NASH Standard is required in order to meet the aims and objectives of PBP 2019.

The objectives required to be met for the purposes of the proposed poultry farm operation relate to access, water supply and services, and emergency and evacuation planning, and include:

- 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 suitable emergency and evacuation (and relocation) arrangements for occupants of the development;
- 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; and
- provide for the storage of hazardous materials away from the hazard wherever possible.

Further, PBP 2019 notes the general fire safely construction provisions of the NCC are taken as acceptable solutions however, construction requirements for bush fire protection will need to be considered on a case-by-case basis.

### 5.3 Liverpool Plains LEP and DCP

The Liverpool Plains LEP 2011 and Liverpool Plains Shire Council DCP 2012 remain the relevant planning instruments for the local government area. The LEP does not provide any additional provisions for consideration in relation to bush fire beyond provisions for bush fire hazard reduction work.

The DCP provides a small number of additional items relating to bush fire protection, beyond that contemplated by PBP 2019. These include:

- for utilities, where no water supply is available, a minimum tank storage of 60,000 litres is required, of which a minimum 10,000 litres is retained for fire fighting purposes (which can increase in bush fire prone areas); and
- the provision of bush fire protection buffers is applicable.

In response to the above items, it is noted the proposed development seeks to provide a total static on-site water supply of two megalitres which will provide for the facility operations as well as its firefighting needs. Further detail is provided at Section 7 of this report.

With regard to bush fire buffers, this matter is addressed by the relevant bush protection measures applying to the proposed development, outlined at Section 7.

## 6 Bush Fire Hazard Assessment

### 6.1 Methodology

The following assessment was carried out in accordance with the provisions of Appendix 1 – Site Assessment Methodology of PBP 2019.

A range of data and instruments have been utilised to perform a desktop analysis to complement available site data. These instruments include:

- local bush fire hazard mapping;
- proposal plans and supporting documentation;
- aerial imagery;
- Liverpool Range Bush Fire Risk Management Plan;
- PBP 2019; and
- AS3959-2009 – Construction of Buildings in Bushfire Prone Areas.

### 6.2 Fire weather

In terms of assessment methodology, it is noted the Fire Danger Index (FDI) relative to the locality being within the Northern Slopes region, is calculated at 80 based upon an estimated 2 per cent AEP (1:50 year ARI) event with a flame temperature of 1,090k and wind speeds of an assumed 45km/hr.

### 6.3 Liverpool Range Bush Fire Risk Management Plan

The Liverpool Range Bush Fire Risk Management Plan (BFRMP) was prepared by the Liverpool Range Bush Fire Management Committee in 2010 and includes the local government areas of Upper Hunter, Liverpool Plains and Gunnedah.

The BFRMP notes the typical climate conditions of the region vary with warm to hot conditions prevalent across the central and western areas, and temperate to cold in the higher areas in the east.

Prevailing weather conditions associated with the bush fire season in the region include strong south-westerly to north-westerly winds accompanied by high day time temperatures and low relative humidity. Dry lightning storms are also frequent across the region.

In terms of the main sources of ignitions in the region, dry lightning storms, escaped private burns, accidental ignition through agricultural activities and arson are identified.

### 6.4 Vegetation classification and fuel loads

Vegetation classification is important for a number of reasons, namely it indicates the level of fire intensity and fire behaviour associated with specific species of vegetation and it also indicates the fuel loads which may exist in certain locations. It stands to reason that different vegetation groups yield very different fire behaviour and intensity attributes by virtue of their characteristics and fuel load output (Hines et al., 2010). The vegetation communities within 140m of the site form the basis of this assessment, as per Appendix 1 of PBP 2019.

The Bush Fire Prone Land Map identifies Category 3 vegetation across the entire site and surrounds, including lands within 140 metres. This reflects the rural landscape of the area and grassland and semi-arid woodland which features across the site and surrounding parcels.

Pursuant to Appendix 1 of PBP 2019, the vegetation within 140 metres of the site is dominated by **grasslands** interspersed with scattered and isolated tree specimens.

Despite the above, a patch of grassy woodland vegetation is present in the south of the site, approximately 100m from the southern laying sheds.

On the opposite side of Warrah Ridge Road is a small area of cropping land. For the purposes of this assessment, these crops are identified as **Woodland** by virtue of the elevated fuel load apparent in this location. This vegetation is not mapped on the Bush Fire Prone Land mapping.

Overall, cropping and grazing land which surrounds the subject site which has the potential to support grass fire under certain conditions subject to the management regime, rainfall and growth rates, drought and curing.

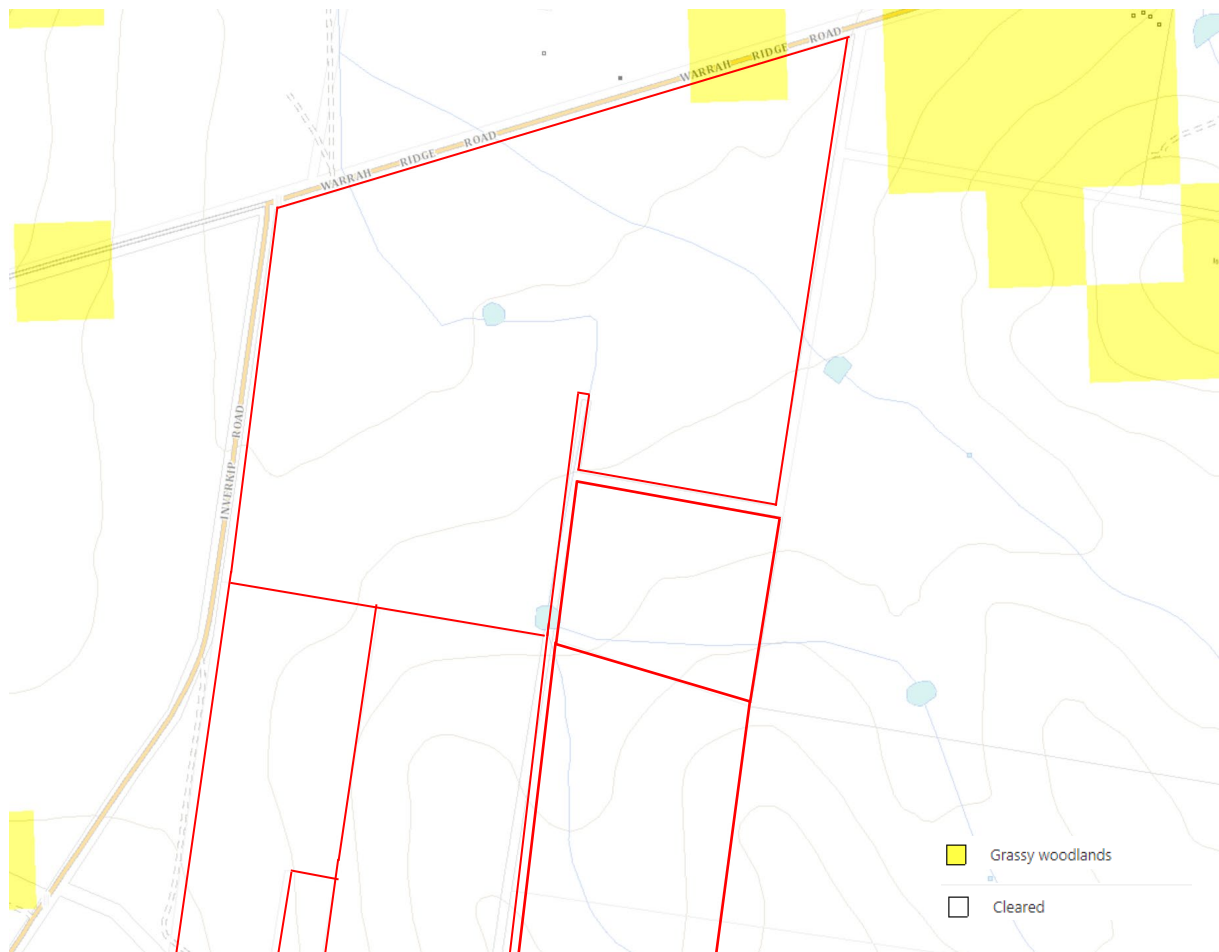


Figure 4: Vegetation assessment area around the subject land (Source: SEED Maps, 2022)

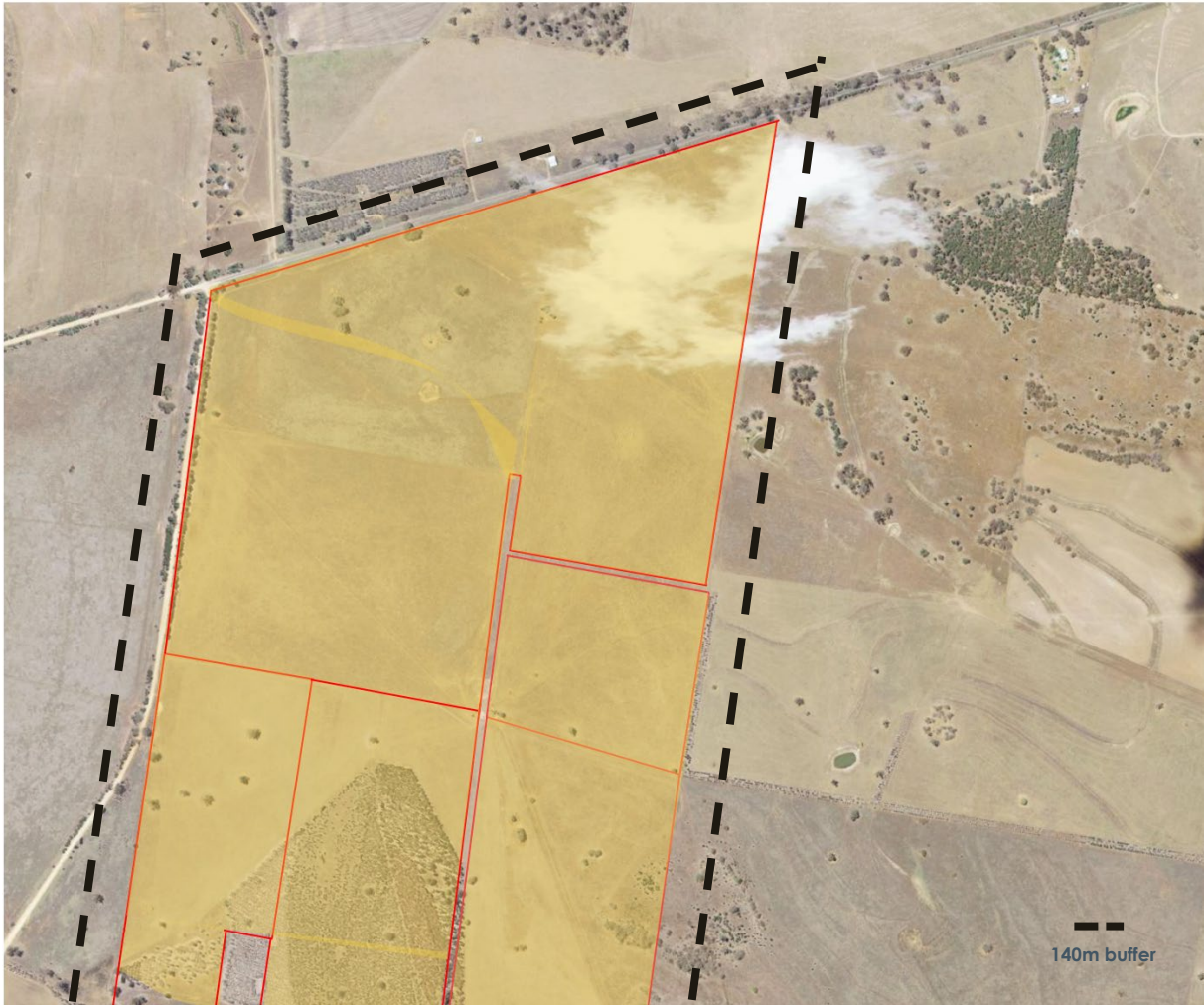


Figure 5: 140m vegetation assessment area around the subject land (Source: Six Maps, 2022)



Figure 6: Inverkip Road looking East (Source PSA Consulting, 2022)



Figure 7: Inverkip Road looking North (Source PSA Consulting, 2022)



## 6.5 Effective slope analysis

Effective slope relates to the topography of vegetation beneath classified vegetation, as this influences fire speed and rate of spread - namely, that the speed of fire doubles for every 10 degrees incline as a general rule.

An effective slope analysis has been undertaken for the farm manager's dwelling and each of the two (2) shed groups.

From a broad perspective, the subject land rises from the west to the east. The southern shed group is located toward a peak in the local topography.



Figure 8 - Site contours (Source: PSA Consulting, 2023)

### 5.5.1 Farm Mangers Residence

The farm manager’s residence is intended to be a singular dwelling, situated south of Warrah Ridge Road as seen below (Figure 9). An effective slope analysis has been undertaken and it is evident that dwelling is positioned on a northern downslope with a maximum slope of 1.15° measured over a distance of 100 to 150 metres. Land to the south is upslope, whilst the east and west represent cross-slopes however, it is the south-westerly downslope that is the dominant slope from a fire behaviour perspective.

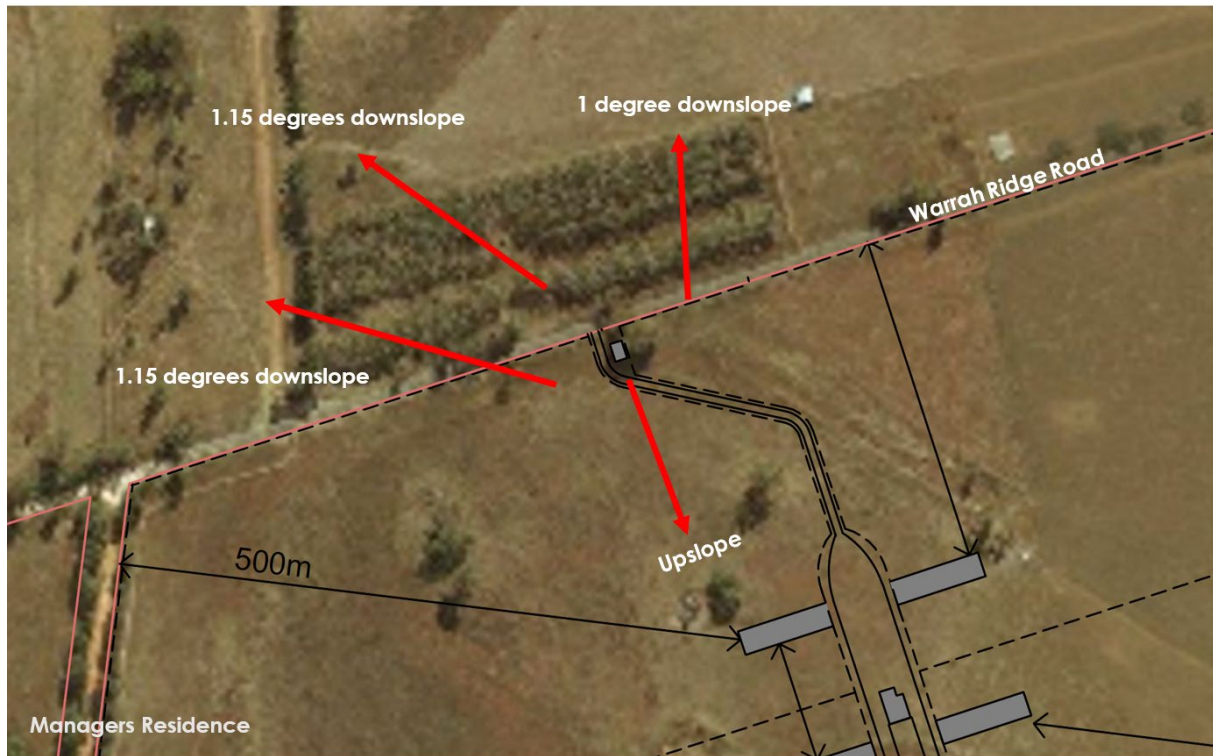


Figure 9 – Farm managers dwelling effective slope assessment

### 5.5.2 Poultry operation

The land surrounding the northern shed group generally falls from the south to the north, with a hilltop crest located to the west. Having regard to the slope within 100 to 150 metres of these laying sheds, land to the south is entirely upslope and land to the north is downslope, falling between 1 and 2 degrees. Minor cross-slopes are observed to the north-east and west, as seen below (Figure 10).

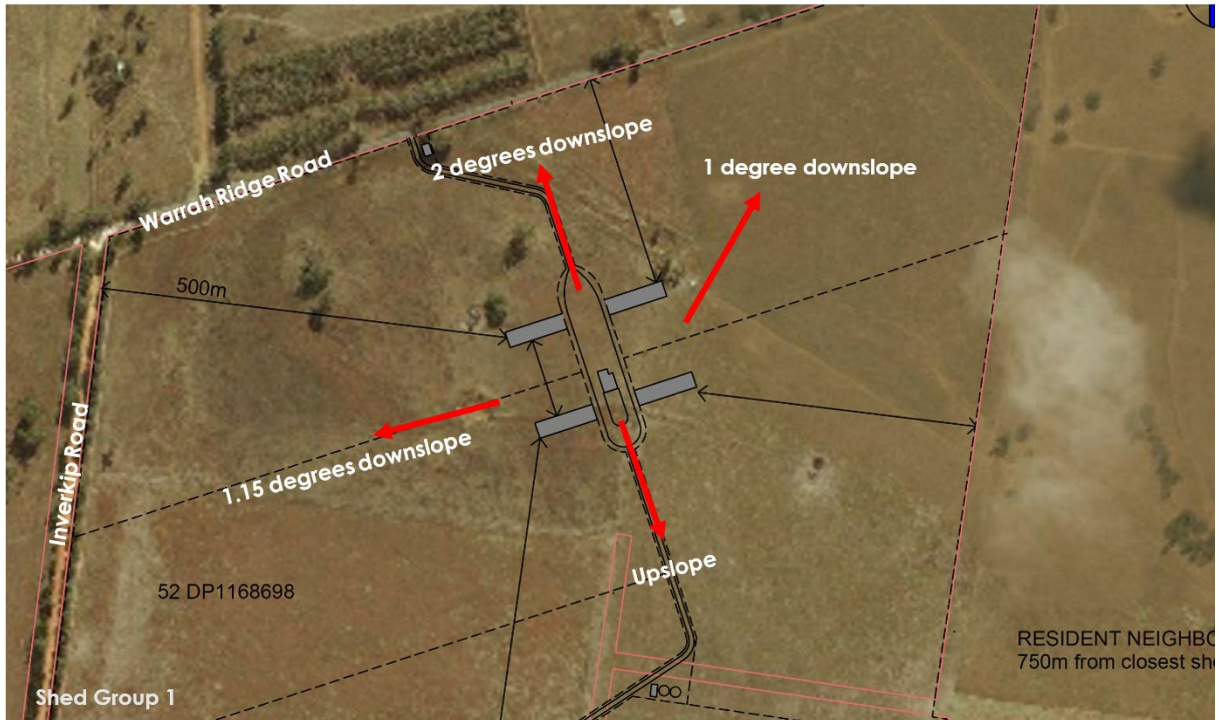


Figure 10: Shed Group 1 effective slope assessment

The land surrounding the southern shed group generally comprises relatively flat grassland plains toward the south that steadily rises to the west and north towards both Inverkip and Warrah Ridge Road. Having regard to the slope within 100 to 150 metres of the development area of the site, land to the south entirely upslope while land to the north, north-east, and west is downslope, falling across a maximum 3 degree slope as seen below (Figure 11).

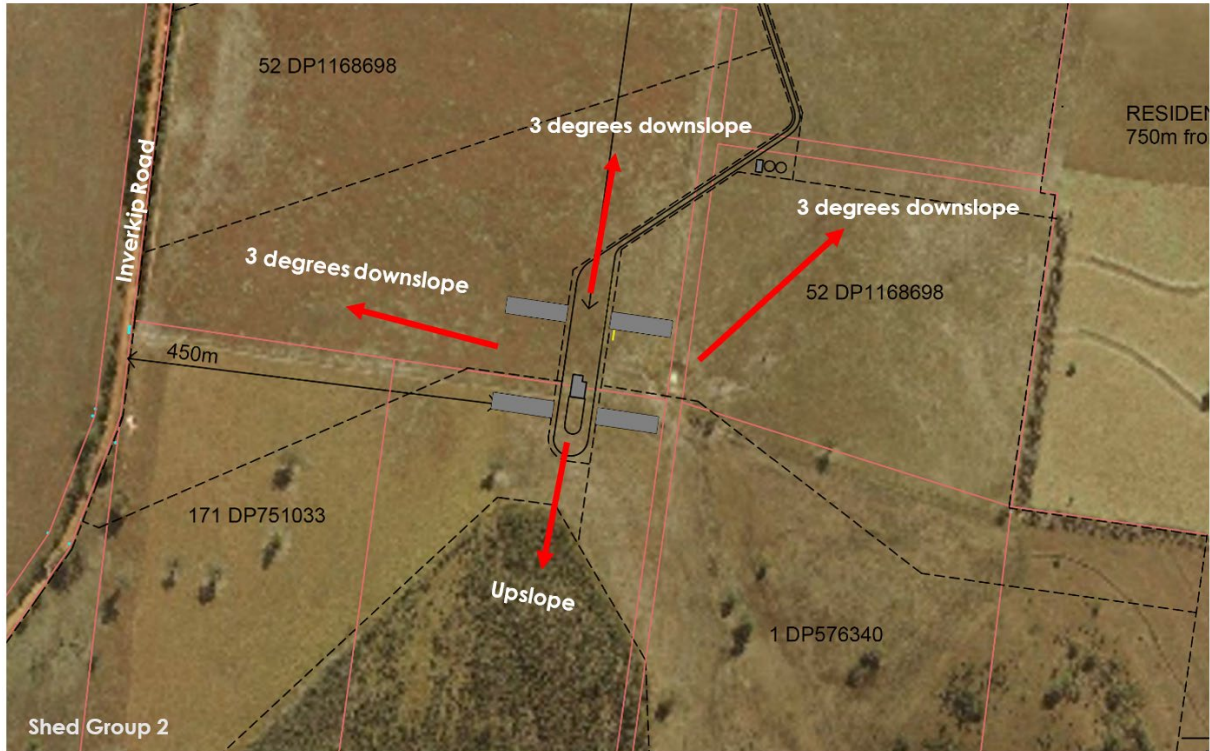


Figure 11: Shed Group 2 effective slope assessment

## 6.6 Bush fire behaviour assessment

The proposed development, being an intensive livestock agriculture use in a rural area is not immune to bush fire risk however, the risk is largely associated with grass fire hazard. Whilst the intensity of fire may not be as significant as for forest and bushland fires, grass fires are fast moving and can lead to damage and loss of equipment, sheds, buildings and other assets.

The southern shed group is approximately 100 metres from a patch of grassy woodland where fire intensity is likely to be elevated however this is also upslope from the shed's location.

In the case of the proposed poultry farm operation, the protection of the birds as a key economic asset, and from a humane perspective, is also a relevant consideration in addition to protection of property and human life more broadly.

It is possible that grass fire could advance toward the shed groups or farm manger's dwelling from almost any direction, but noting the fire wind observations of the Liverpool Range BFRMP, dry south-westerly to north-westerly winds are more likely. From this direction, grass fire will advance toward the site from a generally downslope direction which will increase its rate of spread where fire crosses Warrah Ridge Road and moves towards the proposed development. In the case of subject site, this is gradual and so effect on rate of spread is likely to be more a function of wind speed and direction than influenced by topography. Irrespective, grass fire can be fast moving. Because of its fertile alluvial soil found to the west of Inverkip Road, cropping activities are evident and capable of supporting grassfire (depending on level of irrigation).

From the east or south, grass fire may slow slightly on advancement toward the site due to upslope topography however, wind conditions of the day may still generate fast-moving grass fires. Fire emanating from the north will cross large plains towards the site where rate of spread may increase slightly, again wind direction and speed are likely to be dominant factors.

On the basis of the above, the subject site and proposed development is able to employ bush fire protection measures to enhance the resilience of the operation to the potential impact of grass fire and these are identified at Section 7 of the report.

## 7 Bush Fire Protection Measures

The bush fire risk and hazard context associated with the subject site requires a number of bush fire protection measures as identified by Section 8.3 of PBP 2019.

### 7.1 Access and egress roads

Access and egress (road) networks are significant in terms of a range of aspects of bush fire prevention and ability for firefighting. It must cater for emergency access and egress in times of potential bush fire events.

The proposed poultry farm operation is to be accessed via a central access driveway from Warrah Ridge Road to the farm manager's residence the shed groups. Perimeter roads measuring nine (9) metres in width are provided around each shed.

The property access requirements for residential and rural residential subdivisions provide a reasonable yardstick for assessment and compliance for a facility such as a poultry farm operation in a rural area. These provisions are assessed via the following table.

**Table 1 - Property access compliance assessment**

PBP 2019 property access requirements	Compliance statement
Minimum 4m carriageway width	The proposed access driveway servicing the shed groups and manager's residence measures a minimum dimension of 6 metres.
In forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay	Not applicable. The proposed development is entirely visible from both Warrah Ridge Road and Inverkip Road.
A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches	The proposal complies, there are no trees with branches that overhang the internal access driveway.
Provide a suitable turning area in accordance with Appendix 3	The proposed access road network is designed to facilitate articulated vehicles and thus exceeds the minimum requirements of Appendix 3.
Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress	The proposal complies. A 9 metre wide access driveway around the layer sheds are also provided in addition to the turning bays.
The minimum distance between inner and outer curves is 6m	The proposal complies.
The crossfall is not more than 10 degrees	The proposal complies.
Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads	The proposal complies.
A development comprising more than three dwellings has access by dedication of a road and not by right of way.	Not applicable.

The provisions of PBP 2019 identify minimum 4 metre internal road widths are required to enable vehicle and fire appliance passing, which the proposed development meets and exceeds. The two large vehicle turnaround areas at the front and rear of each shed group exceeds the minimum diameter requirements for vehicle turnarounds for fire appliances. In addition, perimeter roads measuring 9 metres in width are provided around the layer sheds, facilitating an internal network of through roads which will not require fire appliances to use reverse gear.

The proposed internal road network connects directly to Warrah Ridge Road.

The broader subject site is also traversed by a series of internal fire access tracks and trails which link across rural allotments.

## 7.2 Asset protection zones, defensible space and associated BALs

An asset protection zone (APZ) is an area which surrounds a building or asset which is intended to be managed in perpetuity in a no or low fuel condition to aid in the protection of buildings from the effects of flame contact, radiant heat exposure and to assist in the protection of residents. It also offers defensible space for firefighters to work in relative safety from radiant heat exposure.

The APZ dimensions usually also relate to a corresponding bush fire attack level (BAL) pursuant to AS3959.

### 6.2.1 Farm managers dwelling

As per the PBP 2019, the proposed manager's residence must meet the residential requirements of Chapter 7 – Infill Development. A minimum 13m APZ is required by Table A1.12.3 of PBP 2019 (relative to the adjacent woodland area on the opposite side of Warrah Ridge Road) for the manager's residence. In this case, a minimum 23m APZ and BAL-12.5 extent is prescribed which exceeds the minimum APZ requirement of PBP 2019 with a maximum BAL-12.5 BAL construction requirement in accordance with Table A1.12.6 of PBP 2019.

Refer to **Appendix A** for the compliance statement of the Chapter 7 performance criteria and acceptable solutions for residential infill development.

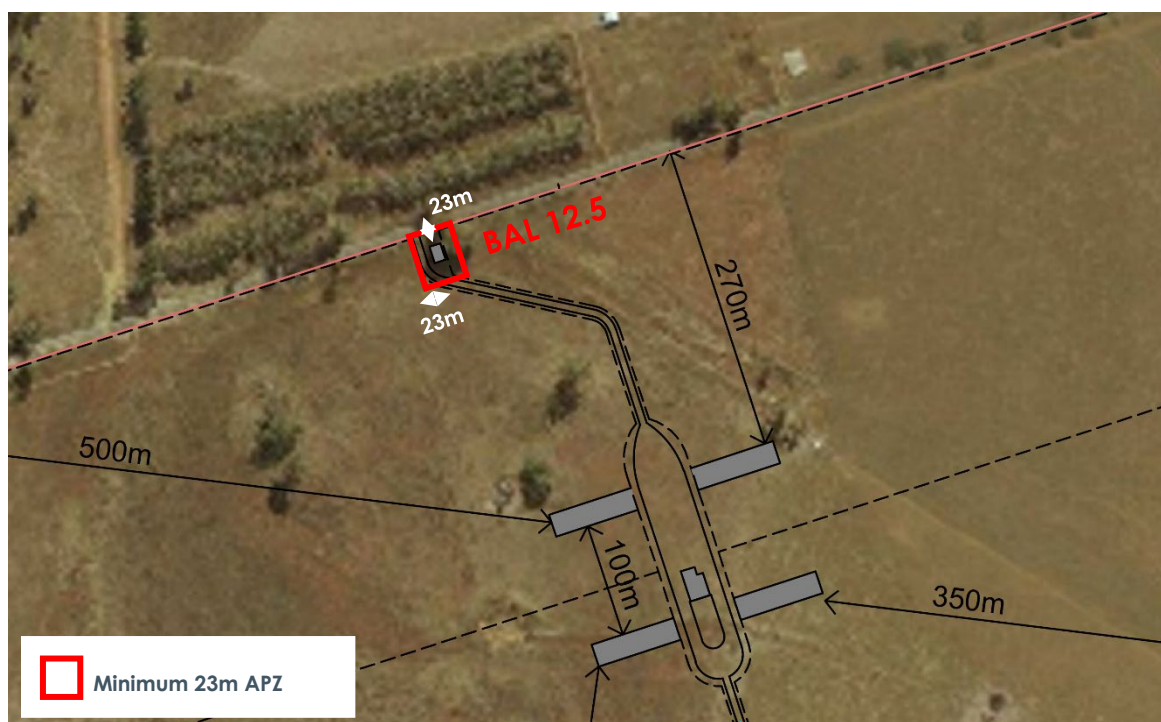


Figure 12: 23m APZ and BAL 12.5 extent

## 6.2.2 Poultry operation

For 'other development' PBP 2019 does not prescribe a minimum APZ dimension. Rather, it notes the general fire safety requirements of the NCC are accepted as adequate for the purposes of bush fire protection, though measures over and above may be provided.

Notwithstanding the above, PBP 2019 requires the consideration of a managed hazard-separation area for firefighting purposes referred to as 'defendable space', as per the aim and objectives of PBP 2019 set out at Section 1.1. Defensible space is an area between buildings and the hazard source which is capable of providing a relatively safe environment in which firefighters can undertake operations to defend an asset or structure. The defensible space dimension is defined by the ability to gain access around an asset, building or structure and conduct defensive firefighting operations.

The APZ / defensible space surrounding each of the two (2) shed groups comprises the 9 metre wide perimeter road. Shed Group 1 also includes a larger earthworks pad which may also contribute but is not factored in as part of the designated APZ .

There are two (2) feed silos situated at each proposed shed group. While these silos are largely contained within the perimeter road of each shed group, a 6 metre defensible space area is required around each silo.

A 10 metre defensive space is required around each of the two (2) sheds which is largely occupied by the 9m wide road round each sheds, and additional earthworks batter extent. The packing sheds are central to the group of laying sheds and surrounded by access driveways, increasing the APZ for this building.

Additional defensible space areas are required around the services building and two (2) steel water tanks which are located along the central access road. The APZ for these facilities must measure a minimum dimension of 10 metres.

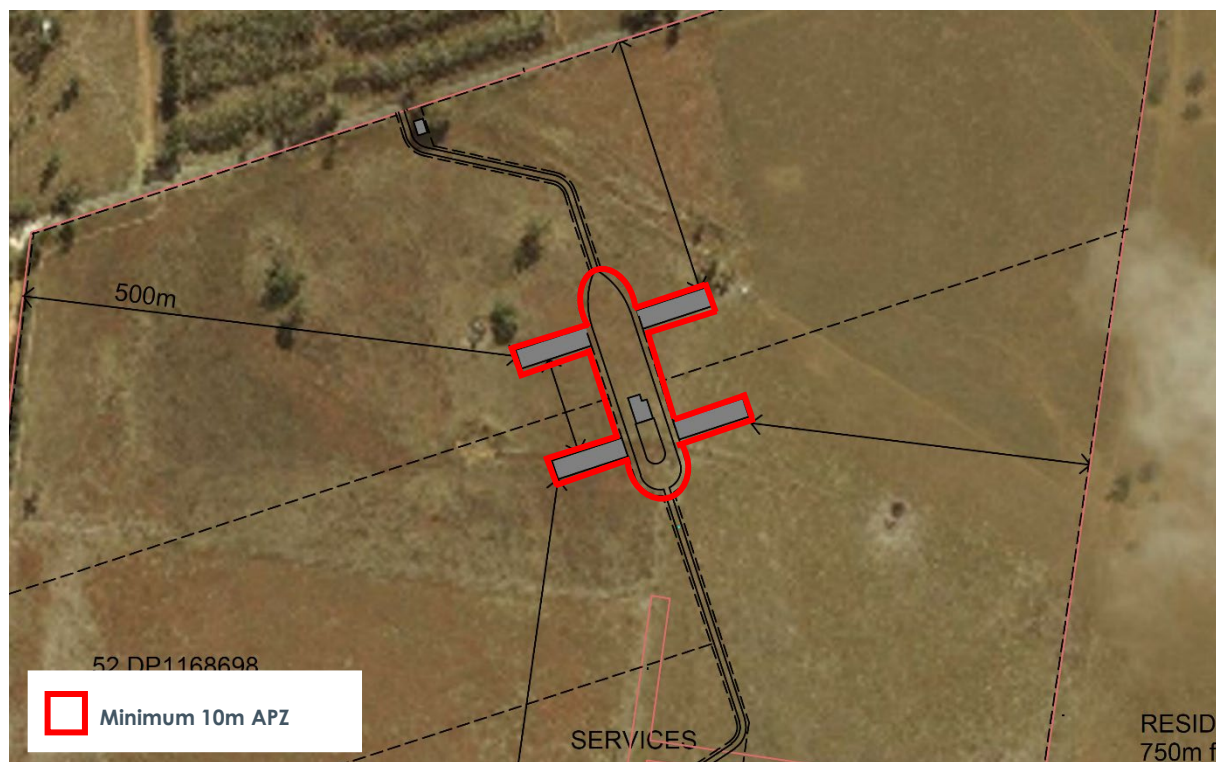


Figure 13: Shed Group 1 APZ



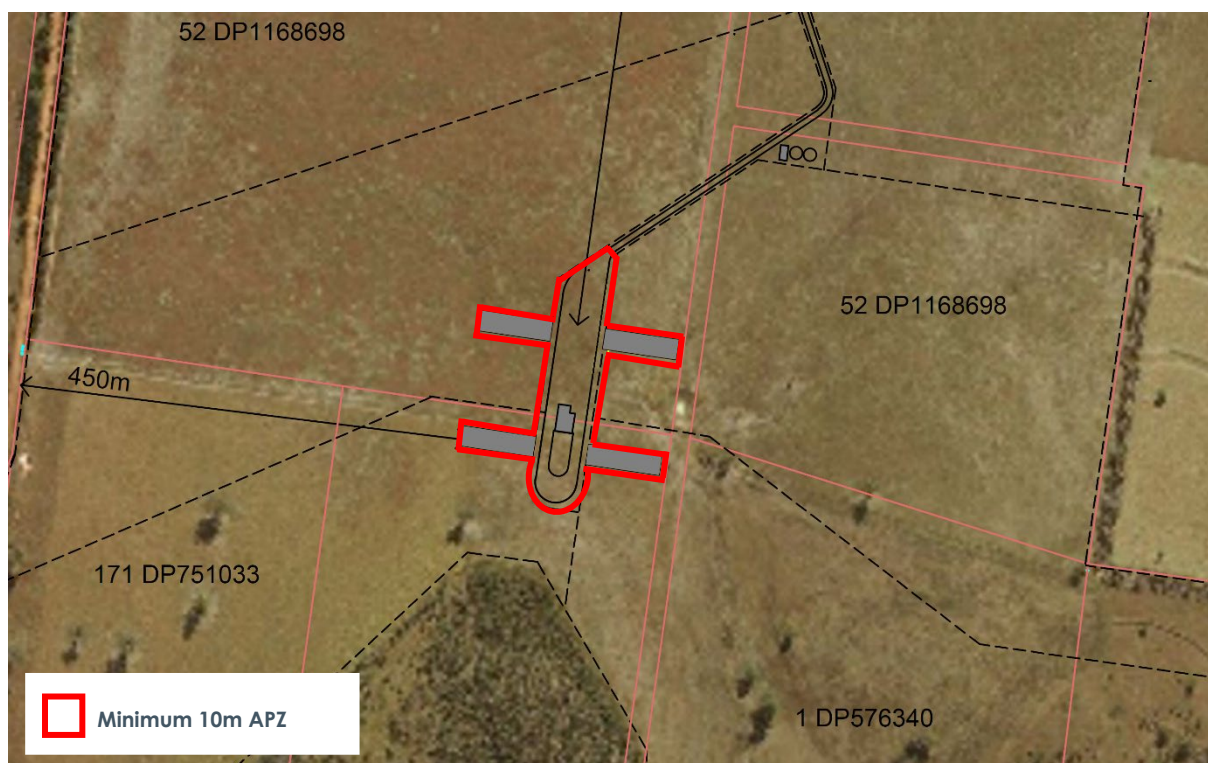


Figure 14: Shed Group 2 APZ

### 7.3 Emergency and evacuation

PBP 2019 identifies at Section 8.3 the requirement for suitable emergency and evacuation arrangements.

The proposed poultry farm operation will employ a workforce of over twelve (12) full time equivalent (FTE) workers, a moderate number of people intended to be on site and responsible for the management of up to 248,000 birds.

The first element of consideration in relation to emergency and evacuation arrangements is the road network which is considered above, and exceeds the minimum design requirements set out by PBP 2019. The internal road network not only doubles as defensible space for firefighting operations and limits the distance to which grass fire might occur adjacent to the buildings, it also provides a direct linkage to Inverkip Road which enables access and egress to/from both the north and south. This provides multiple opportunities for access and egress, depending on the location of the grass fire threat and wind conditions of the day.

In the event of emergency, evacuation of employees from the site may be required in which case, the internal and external road network are capable of facilitating such activities provided departure is decided in sufficient time to enable safe evacuation.

It is not envisaged that the birds occupying the site are reasonably able to be evacuated. However, from a humane perspective the combined bush fire protection measures of defensible space and building construction are intended to offer protection in the event of grass fire. In the event of fire, it is also likely that water supply available on site would be deployed for firefighting purposes and to protect the structural assets which inherently seeks to protect the occupant birds also.

The NSW RFS provides a document 'A guide to developing a bush fire emergency management and evacuation plan' which the facility operators may choose to prepare given the number of employees on site at any one time. Whilst this is not mandated by this assessment, it is recommended.

## 7.4 Water supply, utilities and services

The proposed poultry farm operation will be supplied by two (2) 1 megalitre steel water tanks located adjacent to the services building along the central access road. This is intended to service both day to day farm operations as well as the facility's firefighting water supply.

In terms of the recommendations of this assessment:

1. a 10 metre defensible area is provided around the tanks.
2. each tank is to facilitate fire appliance access by providing an outlet within 4 metres of the standing position of a Category 1 tanking, which is likely to pull up on the central access road. The outlet is to be fitted with a 65mm metal Storz outlet with gate or ball valve.
3. the tanks are to be topped up to full capacity at the start of each regulated fire season and water levels observed throughout each fire season to ensure sufficient firefighting capacity is maintained for the duration of the season.
4. ensure the fire safety provisions of the NCC are implemented and consider the ability for fire fighting equipment provided on site to protect the entirety of each building (i.e. hoses are located and can stretch the perimeter around buildings, etc.).

For electricity supply, PBP 2019 notes the following provisions:

- where practicable, electrical transmission lines are underground; and
- where overhead, electrical transmission lines are proposed as follows:
  - o lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and
  - o no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.

The proposed development is recommended to comply with the above provisions, noting these provisions relate to residential and special fire protection purposes rather than 'other development'. However, in a rural context, liability for ignition from electricity supply on freehold land is the responsibility of the landholder and as such, appropriate steps should be taken in perpetuity (i.e. annual checks and maintenance) to limit the hazard posed by electricity supply.

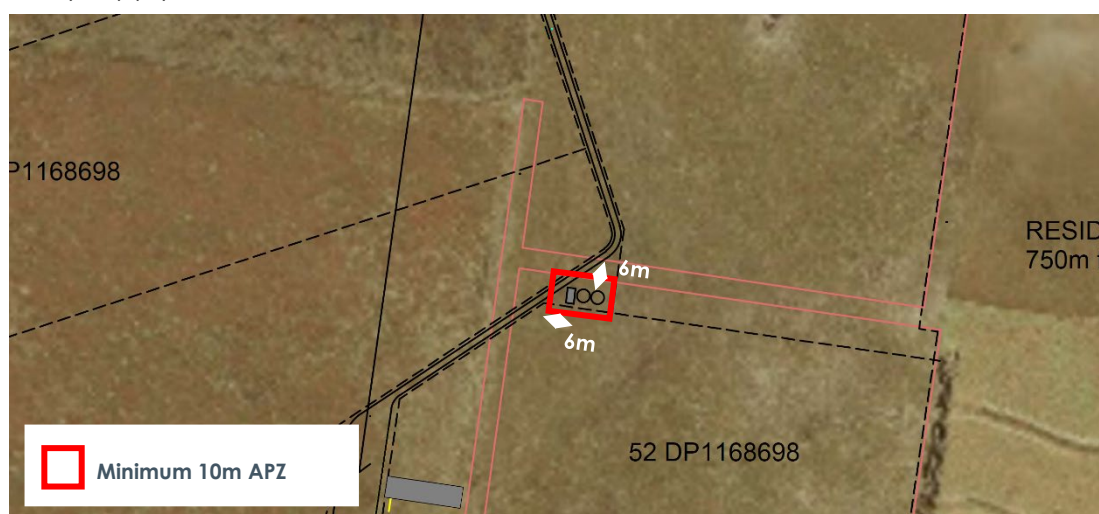


Figure 14: 2x 1 Megalitre water tank APZ

## 7.5 Other recommended bush fire protection measures

Other bush fire protection elements which relate specifically to this proposal are outlined below.

### 6.6.1 Building construction

The shed buildings on site are proposed to be constructed of fire resistant materials including:

- Colorbond metal deck roofs;
- wall cladding constructed of Colorbond (amenities building), PIR panels (poultry sheds and services building) and a combination of concrete and Colorbond (compost building). PIR panels are insulated wall panels which are also fire retardant.

Thus, the majority of built form structures will be constructed using fire-resistant materials and thermal / insulated projects which not only serve to protect the buildings themselves but the birds which will occupy the facility.

The manager's residence will be required to comply with the provisions of AS3959.

### 6.6.2 Landscaping

It is noted that any landscaping to be undertaken across the site must be provided in a manner which does not inadvertently increase the fuel load or fire hazard relevant to the proposed development.

Appendix 4 of PBP 2019 outlines the provisions for '**outer protection zones**' which provide suitable guidance in relation to an appropriate approach to landscaping in this location. To this end, the following is recommended:

#### Trees

- tree canopy cover should be less than 30 per cent; 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 per cent of ground cover.

#### Grass

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

Should landscaping within any APZ be considered, such landscaping must comply with the '**inner protection zone**' provisions of PBP 2019, as follows:

#### Trees

- tree canopy cover should be less than 15 per cent 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.

### 6.6.3 Fire trails and firebreaks

The site layout does not warrant the provision for any additional fire trails or firebreaks however, maintenance and ongoing management of the existing trail and track network across the property is recommended.

## 8 Summary Conclusions and Recommendations

This report considers the bush fire exposure and protection measures required for the proposed intensive livestock agriculture activity involving a poultry farming operation at Warrah Ridge Road, Warrah Ridge. Based upon a range of analytical methodologies, protection measures are identified for incorporation as part of the proposed development to aid in the defence against grass fire with respect to classifiable vegetation surrounding the development site.

Based on this assessment, a range of protection measures have been derived. These are summarised as follows:

1. The farm manager's dwelling is to comply with the BAL-12.5 and 23m APZ provisions of this assessment, except where a further specific assessment is undertaken at building application stage. Its asset protection zone is to be maintained in a low fuel condition (grass height not exceeding 10cm) all-year round, in perpetuity.
2. Internal road and driveway network design and dimensions comply with those set out.
3. Defensible space areas for each laying shed, services building and water tanks are provided at a minimum of 10m in width.
4. Consider the preparation of a bush fire emergency management and evacuation plan to support the safe operation of the facility.
5. The static water supply for the facility meets the following recommendations of this assessment:
  - a. a 10 metre defensible space area is provided around each tank.
  - b. each steel tank is to facilitate fire appliance access by providing an outlet within 4 metres of the standing position of a Category 1 tanker, which is likely to pull up on the central access road. The outlet is to be fitted with a 65mm metal Storz outlet with gate or ball valve.
  - c. the tanks are to be topped up to full capacity at the start of each regulated fire season and water levels observed throughout each fire season to ensure sufficient firefighting capacity is maintained for the duration of the season.
  - d. ensure the fire safety provisions of the NCC are implemented and consider the ability for fire fighting equipment provided on site to protect the entirety of each building (i.e. hoses are located and can stretch the perimeter around buildings, etc.).
6. Provide electricity supply in a manner which complies with the requirements of PBP 2019 and undertake annual checks and maintenance to limit the ignition hazard posed by electricity supply.
7. Ensure any landscaping is undertaken in a manner which complies with the relevant inner or outer protection zone provisions of PBP 2019.
8. Continue to maintain the existing trail and track network across the broader subject site.

It is significant to note that bush and grass fire remains a natural process which is endemic to the Australian landscape and is subject to a range of contributing factors which are variable on a daily basis. As such, it is extremely difficult to predict the behaviour and intensity of a fire event at any given time. On this basis, it remains incumbent upon the facility operators to implement the recommendations of this assessment, utilise local knowledge of grass fire behaviour and implement practices and procedures that ensure operators and site-based staff remain aware of fire danger ratings, ignitions in the area and their options in the event of a grass fire to ensure the preservation of both life and property.



# APPENDICES



## Appendix A - Compliance statement poultry sheds

Performance criteria	Acceptable solutions	Compliance statement
<b>Asset protection zones</b>		
APZs are provided commensurate with the construction of the building; and  A defensible space is provided.	an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	<b>Complies</b>  A 23m APZ and BAL-12.5 extent is provided for the manager's residence based on building envelope / boundary of the dwelling extent.
APZs are managed and maintained to prevent the spread of a fire to the building.	APZs are managed in accordance with the requirements of Appendix 4 of PBP.	<b>Complies</b>  The proposal will comply as required.
the APZ is provided in perpetuity.  APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are wholly within the boundaries of the development site.  APZ are located on lands with a slope less than 18 degrees.	<b>Complies</b>  The proposal complies as required
Home-based child care: the building must not be exposed to radiant heat levels exceeding 29kW/m <sup>2</sup> (1090K).	an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	Not applicable
<b>Access</b>		
firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation.	property access roads are two-wheel drive, all weather roads.	<b>Complies</b>  The proposal complies as required
the capacity of access roads is adequate for firefighting vehicles.	the capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes), bridges and causeways are to clearly indicate load rating.	<b>Complies</b>  The proposal will comply as required.
there is appropriate access to water supply.	hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005;  There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	<b>Complies</b>  The site is serviced by static water supplies, with access available to tanks. A 10m APZ to these tanks is also required.
firefighting vehicles can access the dwelling and exit the property safely.	at least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road;	<b>Complies</b>  Refer to the assessment provided at Section 7.1.



Performance criteria	Acceptable solutions	Compliance statement
	<p>There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.</p> <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> <li>• minimum 4m carriageway width;</li> <li>• in forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay;</li> <li>• a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;</li> <li>• property access must provide a suitable turning area in accordance with Appendix 3;</li> <li>• curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;</li> <li>• the minimum distance between inner and outer curves is 6m;</li> <li>• the crossfall is not more than 10 degrees;</li> <li>• maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and</li> <li>• a development comprising more than three dwellings has formalised access by</li> </ul>	

Performance criteria	Acceptable solutions	Compliance statement
	<p>dedication of a road and not by right of way.</p> <p>Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</p>	
<b>Water supplies</b>		
<p>an adequate water supply is provided for firefighting purposes.</p>	<p>reticulated water is to be provided to the development, where available; and</p> <p>a static water supply is provided where no reticulated water is available.</p>	<p><b>Complies</b></p> <p>The sheds are supported by static water supplies on site. A 10m APZ to these tanks is also required.</p>
<p>water supplies are located at regular intervals; and</p> <p>the water supply is accessible and reliable for firefighting operations.</p>	<p>fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005;</p> <p>hydrants are not located within any road carriageway; and</p> <p>reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.</p>	<p>Not applicable</p>
<p>flows and pressure are appropriate.</p>	<p>fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.</p>	<p>Not applicable</p>
<p>the integrity of the water supply is maintained.</p>	<p>all above-ground water service pipes external to the building are metal, including and up to any taps.</p>	<p><b>Complies</b></p> <p>The proposal will comply as required.</p>
<p>a static water supply is provided for firefighting purposes in areas where reticulated water is not available.</p>	<p>where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d;</p> <p>a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure;</p> <p>65mm Storz outlet with a ball valve is fitted to the outlet; ball valve and pipes are adequate for water flow and are metal;</p>	<p><b>Complies</b></p> <p>The proposal will comply as required.</p>

Performance criteria	Acceptable solutions	Compliance statement
	<p>supply pipes from tank to ball valve have the same bore size to ensure flow volume;</p> <p>underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank;</p> <p>a hardened ground surface for truck access is supplied within 4m;</p> <p>above-ground tanks are manufactured from concrete or metal;</p> <p>raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959);</p> <p>unobstructed access can be provided at all times;</p> <p>underground tanks are clearly marked; tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters;</p> <p>all exposed water pipes external to the building are metal, including any fittings; where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack;</p> <p>any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and</p> <p>fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.</p>	
<b>Electricity services</b>		
<p>location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.</p>	<p>where practicable, electrical transmission lines are underground; and</p> <p>where overhead, electrical transmission lines are proposed as follows:</p> <ul style="list-style-type: none"> <li>lines are installed with short pole spacing (30m), unless crossing gullies,</li> </ul>	<p><b>Complies</b></p> <p>The proposal will comply as required.</p>

Performance criteria	Acceptable solutions	Compliance statement
	gorges or riparian areas; and <ul style="list-style-type: none"> <li>no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.</li> </ul>	
<b>Gas services</b>		
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 materials to a distance of 10m and shielded on the hazard side;  connections to and from gas cylinders are metal; polymer-sheathed flexible gas supply lines are not used; and  above-ground gas service pipes are metal, including and up to any outlets.	<b>Complies</b>  The proposal will comply as required.
<b>Construction standards</b>		
the proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact.	BAL is determined in accordance with Tables A1.12.5 to A1.12.7; and  construction provided in accordance with the NCC and as modified by section 7.5 (please see advice on construction in the flame zone).	<b>Complies</b>  A 23m APZ and BAL-12.5 extent is provided for the manager's residence based on building envelope / boundary of the dwelling extent.
proposed fences and gates are designed to minimise the spread of bush fire.	fencing and gates are constructed in accordance with section 7.6.	<b>Complies</b>  The proposal will comply as required.
proposed Class 10a buildings are designed to minimise the spread of bush fire.	Class 10a buildings are constructed in accordance with section 8.3.2.	Not applicable
Home-based child care: the proposed building can withstand bush fire attack in the form of wind, localised smoke, embers and expected levels of radiant heat.	an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1 of this document around the entire building or structure; and	Not applicable

Performance criteria	Acceptable solutions	Compliance statement
	<p>the existing dwelling is required to be upgraded to improve ember protection. This is to be achieved by enclosing or covering openings with a corrosion-resistant steel, bronze or aluminium mesh with a maximum aperture of 2mm. Where applicable this includes the openable portion of the windows, vents, weepholes and eaves, but does not include roof tile spaces. Weather strips, draught excluders or draught seals shall be installed at the base of side hung external doors as per AS 3959. The subfloor space must be enclosed.</p>	
<b>Landscaping</b>		
<p>landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.</p>	<p>compliance with the NSW RFS 'Asset protection zone standards' (see Appendix 4);</p> <p>a clear area of low-cut lawn or pavement is maintained adjacent to the house;</p> <p>fencing is constructed in accordance with section 7.6; and</p> <p>trees and shrubs are located so that:</p> <ul style="list-style-type: none"> <li>• the branches will not overhang the roof;</li> <li>• the tree canopy is not continuous; and</li> <li>• any proposed windbreak is located on the elevation from which fires are likely to approach.</li> </ul>	<p><b>Complies</b></p> <p>The proposal will comply as required. Minimum APZ requirements are provided for each shed, packaging sheds, service building, water tanks and manager's residence.</p>
<b>Emergency management</b>		
<p>Home-based child care: a bush fire emergency and evacuation management plan is prepared.</p>	<p>a Bush Fire Emergency Management and Evacuation Plan is prepared by the operator consistent with the NSW RFS publication: A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan, and the AS 3745:2010.</p>	<p>Not applicable</p>

