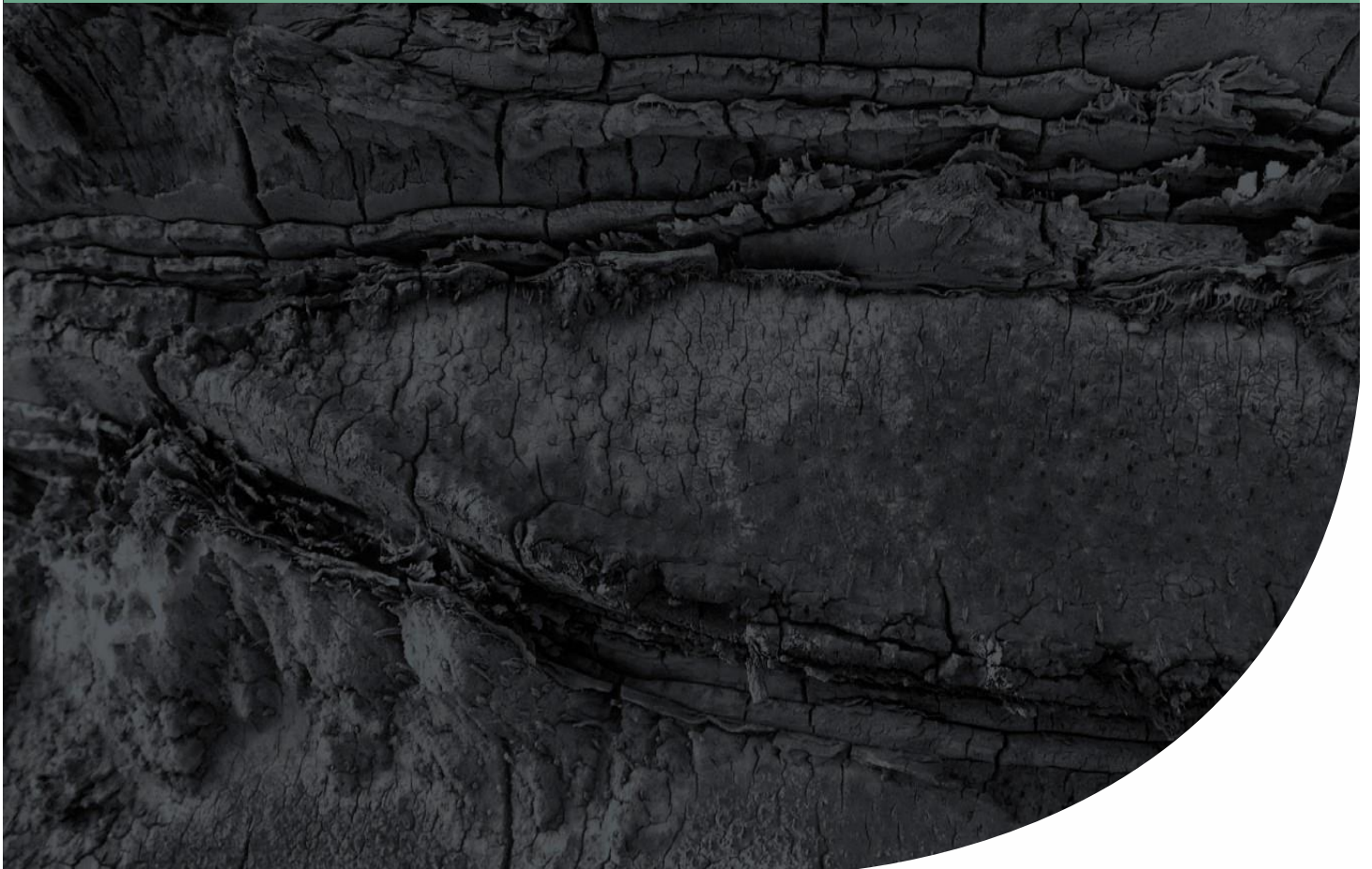


Bushfire Hazard Report

Northern Correctional Facility

Project No: EP22-070(01)

**Prepared for Department of Justice
June 2023**



Bushfire Hazard Report

Northern Correctional Facility



Document Control

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	Draft for client review				
A	February 2023	Dana Elphinstone	DAE	Kirsten Knox	KK
	Amended based on client and TFS comments. 1:200 year design bushfire analysis added.				
B	May 2023	Dana Elphinstone	DAE	Dana Elphinstone	DAE
	Endorsed Bushfire Management Strategy added, and additional analysis.				
C	June 2023	Jason Hick	JDH	Jason Hick	JDH
	Minor amendments following client review				

Disclaimer:

This document has been prepared in good faith and is derived from information sources believed to be reliable and accurate at the time of publication. Nevertheless, it is distributed on the terms and understanding that the author is not liable for any error or omission in the information sources available or provided to us, or responsible for the outcomes of any actions taken based on the recommendations contained herein. It is also expected that our recommendations will be implemented in their entirety, and we cannot be held responsible for any consequences arising from partial or incorrect implementation of the recommendations provided.

This document has been prepared primarily to consider the layout of development and/or the appropriate building construction standards applicable to development, where relevant. The measures outlined are considered to be prudent minimum standards only based on the standards prescribed by the relevant authorities. The level of bushfire risk mitigation achieved will depend upon the actions of the landowner or occupiers of the land and is not the responsibility of the author. The relevant local government and fire authority (i.e. Tasmania Fire Service or local bushfire brigade) should be approached for guidance on preparing for and responding to a bushfire.

Notwithstanding the precautions recommended in this document, it should always be remembered that bushfires burn under a wide range of conditions which can be unpredictable. An element of risk, no matter how small, will always remain. The objective of the Australian Standard AS 3959:2018 is to "prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire" (Standards Australia 2018). Building to the standards outlined in AS 3959 does not guarantee a building will survive a bushfire or that lives will not be threatened by the effects of bushfire attack.

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Executive Summary

The Department of Justice (the proponent) are seeking to progress development of the Northern Correctional Facility at 4260 Meander Valley Road, Deloraine (herein referred to as 'the site'). The site is approximately 38 hectares in size and is bounded by the Western Line railway and Bass Highway to the north, private agricultural land holdings to the east, south and west, and Meander Valley Road to the south. Opposite the site on the northern side of Bass Highway is a pine plantation, over 100 m from the site boundary.

The site is known as the 'Ashley School' and is currently developed with the Ashley Youth Detention Centre. This facility is a custodial facility and includes multiple buildings in a central location used to house young offenders. The facility is surrounded by fencing, associated non-habitable buildings, parking areas, land used for livestock grazing and a single dwelling. The site is predominantly vegetated with pasture grasses in various states of management with well managed and non-vegetated areas within, and immediately surrounding, the existing development on the site.

The entirety of the site is zoned 'Community Purpose' under the Tasmanian Planning Scheme and is subject to multiple overlays. The 'Palmerston-Sheffield' electricity transmission line crosses the site in the north-east corner.

The site is located within a 'bushfire-prone area' under the Bushfire Prone Areas Overlay of the Meander Valley Local Provisions Schedule. The identification of a site within an area declared as bushfire prone necessitates further assessment of the determined bushfire risk affecting the site in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959), and the satisfactory compliance of the proposal with the Bushfire-Prone Areas Code of the Tasmanian Planning Scheme and the *Director's Determination – Bushfire Hazard* (Director's Determination) ((DoJ 2021)).

As part of assessing the long-term bushfire risk to the site, vegetation classifications have been detailed for the post-development scenario (in accordance with AS 3959) in order to inform a bushfire attack level (BAL) assessment. The site is predominantly subject to risk from surrounding grassland in various states of management. The site is large enough to accommodate sufficient managed areas to ameliorate risk from surrounding vegetation.

In order to resolve the potential for bushfire to affect the site, a post development scenario has been assumed in which all classified vegetation within the site can be removed and converted to non-vegetated and low threat vegetation. All classified vegetation outside the site, is assumed to remain in its existing condition and therefore pose a bushfire risk to the site in the long-term. The minimum hazard management area has been shown on the Bushfire Hazard Management Plan to provide sufficient separation for the indicative development area to achieve a maximum BAL-12.5 rating. The hazard management area required to achieve BAL-LOW for the developable area has also been shown on the Bushfire Hazard Management Plan.

The outcomes of this due diligence report demonstrate that as development progresses, it will be possible for future development to satisfy the applicable provisions of the Bushfire Prone Areas Code, The National Construction Code, and the Director's Determination. This report can be updated based on the future design to support the development application process.

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Appendices

Appendix A

Emergency Management Strategy

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List of Abbreviations

General terms	
AHD	Australian Height Datum
APE	Annual Probability of Exceedance
AS	Australian Standard
BAL	Bushfire Attack Level
BHMP	Bushfire Hazard Management Plan
BPAD	Bushfire Planning and Design
FDI	Fire Danger Index
FFDI	Forest Fire Danger Index
FZ	Flame Zone
GEV	General Exceedance Value
GFDI	Grassland Fire Danger Index
HMA	Hazard Management Area
Organisations	
DoJ	Department of Justice
TFS	Tasmania Fire Service
Legislation	
AS 3959	Australian Standard 3959:2018 Construction of buildings in bushfire prone areas
LUPAA	Land Use Planning and Approvals Act
Director's Determination	Director's Determination – Bushfire Hazard Areas 2021
Planning and building terms	
LPS	Local Provisions Schedule
NCC	National Construction Code
TPS	Tasmania Planning Scheme
Units of measurement	
cm	Centimetre
ha	Hectare
m	Metre
m ²	square metre
m AHD	m in relation to the Australian height datum
mm	Millimetre

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1 Introduction

1.1 Background

The Department of Justice (the proponent) are seeking to progress development of the Northern Correctional Facility at 4260 Meander Valley Road, Deloraine (herein referred to as 'the site'). The site is approximately 38 hectares (ha) in size and is bounded by the Western Line railway and Bass Highway to the north, private agricultural land holdings to the east, south and west, and Meander Valley Road to the south, as shown in **Figure 1**. Opposite the site on the northern side of Bass Highway is a pine plantation, over 100 m from the site boundary.

The site is known as the 'Ashley School' and is developed with the Ashley Youth Detention Centre. This facility is a custodial facility and includes multiple buildings in a central location used to house young offenders. The facility is surrounded by fencing, associated non-habitable buildings, parking areas, land used for livestock grazing and a single dwelling (**Plate 1**). The site is predominantly vegetated with pasture grasses in various states of management with well managed and non-vegetated areas within, and immediately surrounding, the existing development on the site (**Plate 2** and **Plate 3**).

Due to the nature of the facility, future buildings would be expected to be used as an on-site refuge in the event of a bushfire. To ensure that the facility meets the requirements for a refuge, this report includes calculation of the Annual Probability of Exceedance for a 1:200 year design bushfire.



Plate 1: Existing development within the site including carparking areas, administration building (left) and detention centre (behind fence)

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Emerge Associates
02.09.2022 11:35
-41.5221, 146.70248 (+5m)
Altitude: 255m
4260 Meander Valley Rd, Deloraine TAS

Plate 2: Pasture vegetation to the west of the existing detention centre



Emerge Associates
02.09.2022 12:01
-41.52243, 146.70517 (+4m)
Altitude: 251m
4260 Meander Valley Rd, Deloraine TAS

Plate 3: Pasture vegetation to the east of the existing detention centre

The site is located within a 'bushfire-prone area' under the Bushfire Prone Areas Overlay of the Meander Valley Local Provisions Schedule, as shown in **Plate 4**. The identification of a site within an area declared as bushfire prone necessitates further assessment of the determined bushfire risk affecting the site in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959), and the satisfactory compliance of the proposal with the Bushfire-Prone Areas Code of the Tasmanian Planning Scheme and building compliance with the Director's Determination – Bushfire Hazard Areas (Director's Determination) ((DoJ 2021)).

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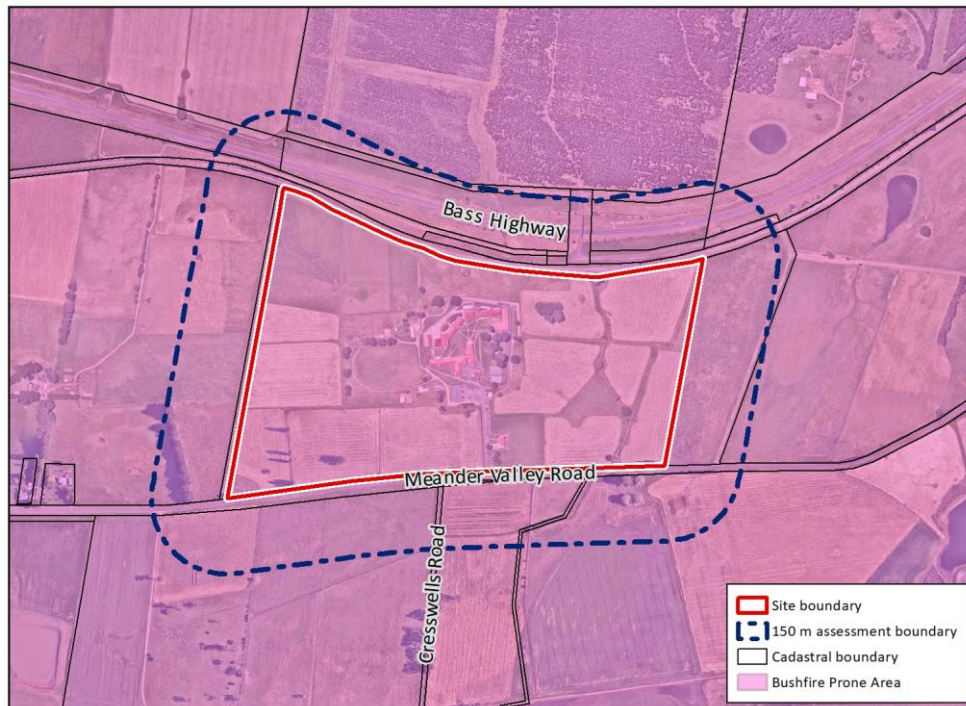


Plate 4: Areas within and surrounding the site identified as bushfire-prone areas (as indicated in pink) under the Bushfire-Prone Areas overlay (LISTMap 2022).

1.2 Planning context

The entirety of the site is zoned 'Community Purpose' under the Tasmanian Planning Scheme (TPS), as shown in **Plate 5**, and is subject to multiple overlays under the TPS. These overlays include:

- Bushfire-prone areas (see **Plate 4** above);
- Electricity transmission corridor: The 'Palmerston-Sheffield' electricity transmission line crosses the site in the north-east corner. Development in this area is subject to the Electricity Transmission Infrastructure Protection Code of the TPS;
- Waterway and coastal protection areas : There are two waterways mapped within the eastern portion of the site. Development in this area is subject to the Natural Assets Code of the TPS;

The site adjoins the State Rail Network - Western Line on the northern boundary. Future development within 50 m of the railway line would be subject to the Road and Railway Assets Code.

The future development is intended to be located outside of these overlays.

The development of a new custodial facility is not generally permitted within the 'Community Purpose' zone under the Tasmanian Planning Scheme State Planning Provisions. However, the Meander Valley Local Provisions Schedule provides a site-specific qualification (MEA-27.2) allowing a custodial facility as a permitted use within this site.

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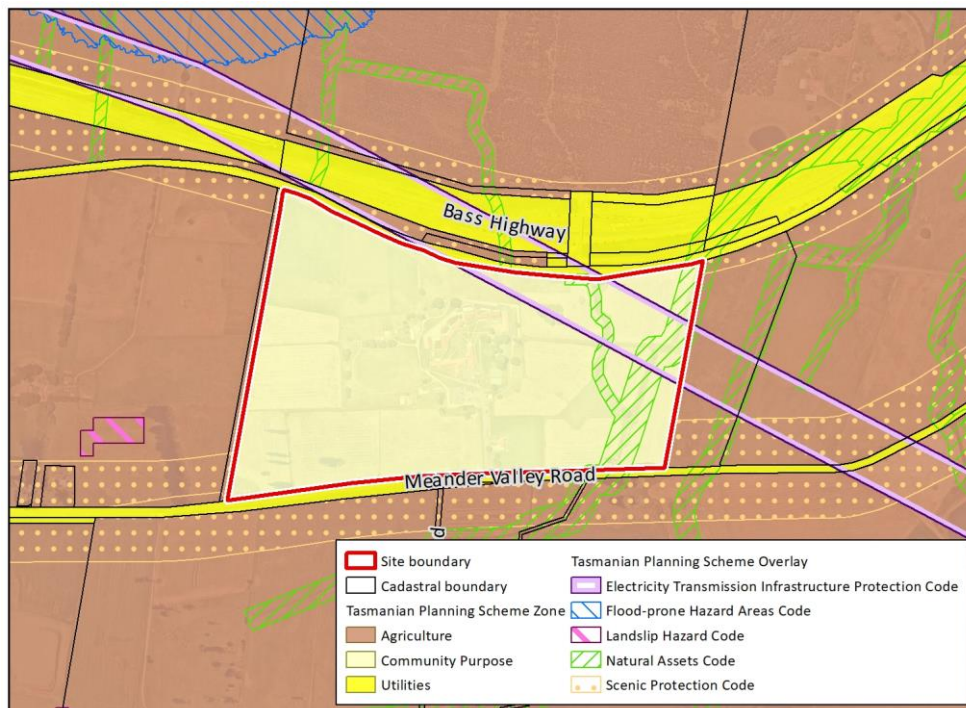


Plate 5: Tasmanian Planning Scheme Zoning, in and surrounding the site.

1.3 Aim of this report

The purpose of this report is to assess bushfire hazards both within the site and nearby and demonstrate that the threat posed by any identified hazards can be appropriately mitigated and managed. This report has been prepared to support the future development of the site and addresses the requirements of the Bushfire Prone Areas Code, the National Construction Code (NCC), and the Director's Determination. This bushfire hazard report provides a due diligence assessment to inform the location of the future development. The report can then be updated based on the future design. The document includes:

- An assessment of the existing classified vegetation in the vicinity of the site (within 150 m) and consideration of bushfire hazards that will exist in the post development scenario (**Section 2**).
- Commentary on how the future development can achieve the acceptable solutions for a vulnerable use outlined within the Bushfire Prone Areas Code, and the deemed-to-satisfy solutions of the NCC and the Director's Determination including an indication of BAL ratings likely to be applicable to future habitable building (**Section 2.3, 4 and 5**).
- Consideration for future approval processes (**Section 6**)
- An outline of the roles and responsibilities associated with implementing this bushfire hazard report (BHR) (**Section 7**).

1.4 Description of the proposed development

The site is proposed to be developed as a custodial facility. It is likely that the proposed development may include partial or full demolition or retention of the existing facilities and construction of a new custodial facility including multiple buildings, fencing, internal access and parking areas. The exact location and building class/es of the facilities is yet to be determined. Landscaping within the site will

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be designed to achieve low threat vegetation in accordance with Section 2.2.3.2 of AS 3959. It is likely that a 5 m high vegetation screen will be implemented on the property perimeter. Ongoing maintenance of vegetation can ensure that a low threat standard is achieved.

A 6 m high concrete perimeter fence is being considered as part of security measures. This is relevant to any future Method 2 calculations under AS 3959.

1.5 Environmental considerations

Environmental values within and near to the site have been considered as part of this report to ensure that management of bushfire hazard is balanced with the protection of environmental values. A summary of the search results has been provided in **Table 1**.

The majority of the site has been cleared of vegetation and is mostly pasture grasses with scattered mature trees. As a result, the site contains limited environmental values of conservation significance.

Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the LIST Map databases)

Key environmental feature	Yes / no / potentially occurring within the site	If yes / potentially, describe value that may be impacted
Threatened Native Vegetation Community	No	No threatened native vegetation communities are present within or near to the site. The site and the surrounding area are mapped as agricultural land under TASVEG 4.0.
Waterways and coastal protection areas	Yes	The site includes a natural unnamed tributary waterway and an artificial watercourse. Development within 30 m of these waterways is subject to the Natural Assets Code of the TPS.
RAMSAR Wetlands	No	No RAMSAR wetlands are present within the site.
Wetlands	No	No wetlands are present within the site.
Threatened and conservation significant flora	No	No threatened or conservation significant flora have been identified within the site. The site is highly modified and unlikely to provide suitable habitat.
Threatened and conservation significant fauna	No	No threatened or conservation significant fauna have been identified within the site. The site is highly modified and unlikely to provide suitable habitat. The following threatened or significant fauna species have been recorded in the surrounding area and may therefore traverse the site intermittently: • <i>Aquila audax</i> (wedge-tailed eagle) • <i>Sarcophilus harrisii</i> (Tasmanian devil) • <i>Perameles gunnii</i> (eastern barred bandicoot) • <i>Ornithorhynchus anatinus</i> (platypus) • <i>Circus approximans</i> (swamp harrier) • <i>Gallinula mortierii</i> (Tasmania native hen) • <i>Pseudocheirus peregrinus</i> subsp. <i>Convolutor</i> (common ringtail possum) – multiple occurrences recorded within pine plantation north of the site • <i>Isodon obesulus</i> (southern brown bandicoot) • <i>Trichosurus vulpecula</i> subsp. <i>Fuliginosus</i> (common brushtail possum)

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Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the LIST Map databases) (continued)

Key environmental feature	Yes / no / potentially occurring within the site	If yes / potentially, describe value that may be impacted
Wedge-tailed Eagle Nesting Habitat	No	No nesting habitat is located within or near to the site.
Aboriginal Cultural Heritage	No	Not applicable. No listed Indigenous heritage places were identified within or nearby to the site.
Tasmanian Heritage Register	No	Not applicable. No registered European historic heritage sites were identified within or nearby to the site.

The proponent will undertake detailed investigations into natural values, and Aboriginal and historic cultural heritage values within the site, including site-specific surveys.

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2 Bushfire Attack Level Assessment

Bushfire risk for the site has been appropriately considered both in context to the site and potential impact upon the site using AS 3959. The objective of AS 3959 is to reduce the risk of ignition and loss of a building to bushfire. It provides a consistent method for determining a radiant heat level (radiant heat flux) as a primary consideration of bushfire attack. AS 3959 measures the Bushfire Attack Level (BAL) as the radiant heat level (kW/m²) over a distance of 100 m. AS 3959 also prescribes deemed-to-satisfy construction responses that can resist the determined radiant heat level at a given distance from the fire. It is based on six Bushfire Attack Level (BAL) ratings: BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

A BAL contour plan has been prepared to visually represent the different BAL ratings applicable to the site based on the setback distances detailed within Method 1 of AS 3959. This gives an indication of the BAL ratings likely to be applicable to future buildings.

2.1 Assessment inputs

This bushfire attack level (BAL) assessment was undertaken in accordance with Method 1 of AS 3959. This assessment is based on two post-development scenarios for the site:

- An indicative development area within the site together with a HMA providing separation for BAL-LOW development. Post-development vegetation and effective slope is shown in **Figure 2**, with the resulting BAL ratings shown in **Figure 3**; and
- An indicative development area within the site together with a HMA providing separation for BAL-12.5 development. Post-development vegetation and effective slope is shown in **Figure 4**, with the resulting BAL ratings shown in **Figure 5**.

A site visit was undertaken on 2 September 2022. All vegetation within 150 m of the site was classified in accordance with Clause 2.2.3 of AS 3959. Each distinguishable vegetation plot is described in **Table 2**.

2.1.1 Assumptions

The BAL assessment is based on the following assumptions:

- **Designated FDI:** 80¹
- **Flame temperature:** 1090 K
- **Effective slope beneath classified vegetation:** flat/upslope and downslope >0-5°
- Vegetation within the indicative developable areas and hazard management areas have been shown as non-vegetated and low threat, respectively.
- Classified vegetation that has been identified outside of the proponent's landholdings has been assumed to remain in its current state (unless stated otherwise) and will therefore continue to be a bushfire hazard to development within the site.
- Areas of grassland can include up to 10% foliage cover from shrubs and trees, per AS 3959.

¹ The FDI typically designated for Tasmania is FDI 50. FDI 80 has been used as a conservative measure to provide future proofing for the facility. See **Section 2.3** for further detail.

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Table 2: AS 3959 Vegetation Classification (refer to **Figure 2**)

Photo ID:	1	Plot:	1	
Vegetation Classification or Exclusion Clause				
Forest				
Description / Justification for Classification				
Vegetation far north of the site includes a pine plantation. This vegetation is characterised by dense pine trees with a current height of at least 15 m with greater than 30% foliage cover.				
Note: It was not possible to access the portion of the plantation that is within 150 m of the site. These photos are considered representative of the predominant vegetation.				
Photo ID:	2	Plot:	1	
Vegetation Classification or Exclusion Clause				
Forest				
Description / Justification for Classification				
Photo 2 show the pine plantation in the background. This vegetation is characterised by dense pine trees at least 15 m in height with greater than 30% foliage cover. Grassland is visible in the foreground.				
Photo ID:	3	Plot:	2	
Vegetation Classification or Exclusion Clause				
Grassland				
Description / Justification for Classification				
Vegetation to the northwest of the site is characterised by pasture grass generally less than 200 mm in height with taller (around 500 mm) grass located along fence lines and in the rail reserve. Scattered trees comprise less than 10% foliage cover.				



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Table 2: AS 3959 Vegetation Classification (refer to **Figure 2**) (continued)

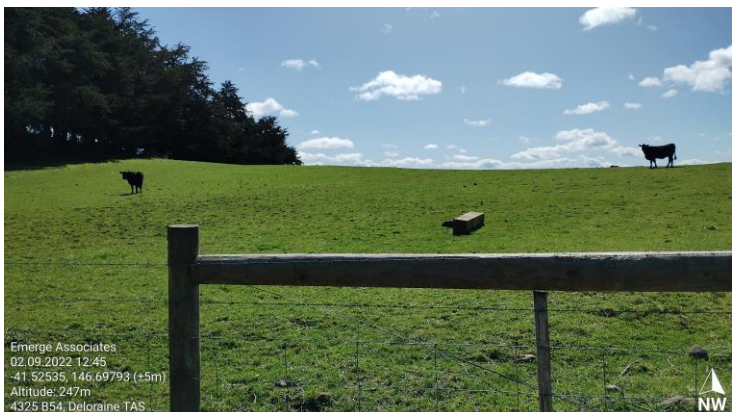
Photo ID:	4	Plot:	2
Vegetation Classification or Exclusion Clause			
Grassland			
Description / Justification for Classification			
Pasture grasses within the site are generally less than 300 mm in height with longer grass located along fence and drainage lines. This vegetation has been treated as unmanaged to ensure appropriate separation is provided regardless of grazing rotation regimes.			
 Emerge Associates 02.09.2022 12:14 -41.52218, 146.70886 (+5m) Altitude: 229m Bass, National Highway 1, Deloraine TAS			
Photo ID:	5	Plot:	2
Vegetation Classification or Exclusion Clause			
Grassland			
Description / Justification for Classification			
Pasture grasses within the site are generally less than 300 mm in height with longer grass located along fence and drainage lines. This vegetation has been treated as unmanaged to ensure appropriate separation is provided regardless of grazing rotation regimes.			
 Emerge Associates 02.09.2022 12:15 -41.52256, 146.70835 (+17m) Altitude: 236m 4214 Meander Valley Rd, Deloraine TAS			
Photo ID:	6	Plot:	3
Vegetation Classification or Exclusion Clause			
Grassland			
Description / Justification for Classification			
Vegetation along the rail reserve (running west to east) to the north of the site is generally unmanaged and is characterised by tall grass and occasional weeds predominantly comprising blackberry species. All blackberry plants were dead on inspection suggesting regular poisoning is occurring. This vegetation was predominantly under one metre in height and is therefore classified as grassland.			
 Emerge Associates 02.09.2022 12:09 -41.52119, 146.70851 (+4m) Altitude: 237m Bass, National Highway 1, Deloraine TAS			

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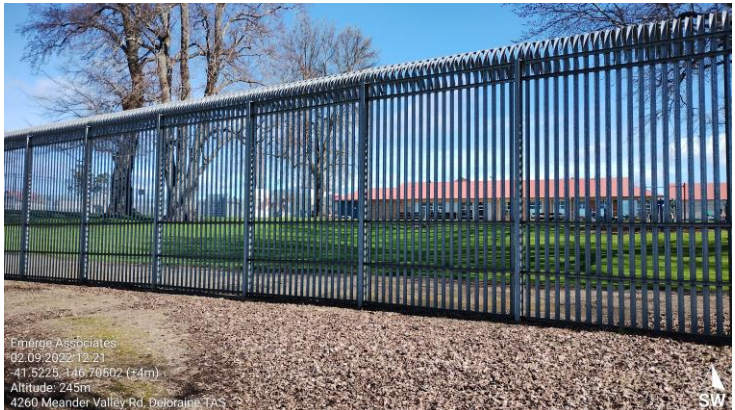
Table 2: AS 3959 Vegetation Classification (refer to **Figure 2**) (continued)

Photo ID:	7	Plot:	3
Vegetation Classification or Exclusion Clause			
Grassland			
Description / Justification for Classification			
Vegetation south of the site (looking east) associated with agricultural land holdings includes significant areas of unmanaged grassland.			
 Emerge Associates 02.09.2022 12:38 -41.52525, 146.70321 (±4m) Altitude: 242m 4260 B54, Deloraine TAS			
Photo ID:	8	Plot:	3
Vegetation Classification or Exclusion Clause			
Grassland			
Description / Justification for Classification			
Agricultural landholdings to the south of the site (looking east) include unmanaged pasture grass and herbfelds, classified as grassland.			
 Emerge Associates 02.09.2022 12:43 -41.5254, 146.69882 (±4m) Altitude: 245m 4325 Meander Valley Rd, Deloraine TAS			
Photo ID:	9	Plot:	4
Vegetation Classification or Exclusion Clause			
Grassland			
Description / Justification for Classification			
Vegetation to the west of the site is extremely well-managed pasture supporting livestock. There is a single row of pine trees present with management of the lower tree limbs, and is considered a windbreak. This vegetation has been classified as grassland to ensure that sufficient separation is still provided if and when not used for grazing.			
 Emerge Associates 02.09.2022 12:45 -41.52535, 146.69793 (±5m) Altitude: 247m 4325 B54, Deloraine TAS			

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Table 2: AS 3959 Vegetation Classification (refer to **Figure 2**) (continued)

Photo ID:	10	Plot:	4
Vegetation Classification or Exclusion Clause			
Exclusion 2.2.3.2 (e) – non-vegetated areas			
Description / Justification for Classification			
The existing Ashley Youth Detention Centre includes a central area developed with multiple buildings and associated non-vegetated areas with well managed vegetation including lawns and garden beds. These areas are not considered a hazard. This plot has been shown as non-vegetated for reference despite including low threat vegetation (e.g., exclusion 2.2.3.2 (f)).			
 Emerge Associates 02.09.2022 12:27 -41.52365, 146.70395 (±4m) Altitude: 252m 4260 B54, Deloraine TAS			
Photo ID:	11	Plot:	4
Vegetation Classification or Exclusion Clause			
Exclusion 2.2.3.2 (e) – non-vegetated areas			
Description / Justification for Classification			
Buildings and non-vegetated areas associated with the existing facility are excluded from classification as they are not a hazard.			
 Emerge Associates 02.09.2022 11:34 -41.5221, 146.70288 (±5m) Altitude: 250m 4260 Meander Valley Rd, Deloraine TAS			
Photo ID:	12	Plot:	4
Vegetation Classification or Exclusion Clause			
Exclusion 2.2.3.2 (e) – non-vegetated areas			
Description / Justification for Classification			
Buildings and non-vegetated areas associated with the existing facility are excluded from classification as they are not a hazard.			
 Emerge Associates 02.09.2022 12:21 -41.5225, 146.70502 (±4m) Altitude: 245m 4260 Meander Valley Rd, Deloraine TAS			

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2.2 Assessment outputs

The vegetation classification undertaken in **Section 2** is summarised in **Table 3**. The resultant BALs are shown in **Figure 3** and **Figure 5**. BAL ratings are based on the minimum distance outlined in Table 2.5 of AS 3959 with the relevant distances outlined in **Table 4**.

Table 3: AS3959 Vegetation Classification and Effective Slope

Plot	Applied vegetation classification	Effective slope
1	Class A – Forest	Flat/upslope
2	Class G – Grassland	Downslope >0-5°
3	Exclusion 2.2.3.2 (e)	N/A
4	Exclusion 2.2.3.2 (f)	N/A

Table 4: Setback distances based on vegetation classification and effective slope and Table 2.5 of AS 3959, as determined by the method 1 BAL assessment

Plot number	Vegetation classification	Effective slope	Distance to vegetation (from Table 2.5 of AS 3959)	BAL rating
Plot 1	Forest (Class A)	Flat/upslope	< 16 m	BAL-FZ
			16 - < 21 m	BAL-40
			21 - < 31 m	BAL-29
			31 - < 42 m	BAL-19
			42 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 2	Grassland (Class G)	>0-5°	< 7 m	BAL-FZ
			7 - < 9 m	BAL-40
			9 - < 14 m	BAL-29
			14 - < 20 m	BAL-19
			20 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW
Plot 3	Grassland (Class G)	Flat/upslope	< 6 m	BAL-FZ
			6 - < 8 m	BAL-40
			8 - < 12 m	BAL-29
			12 - < 17 m	BAL-19
			17 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW

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2.3 Determination of Annual Probability of Exceedance

The future facility is intended to be used as a refuge in the event of a bushfire (discussed further in **Appendix A**). To ensure that the siting and construction of future habitable buildings are suitable for their intended purpose, the Annual Probability of Exceedance (APE) has been determined following the NCC Bushfire Verification Method (ABCB 2021). A Class 3 portion of a detention centre that is reliant on a 'defend in place' strategy is designated as Importance Level 4, which should be designed for a 1:200 year design bushfire. This assessment uses a Generalised Extreme Value (GEV) analysis to determine the APE (or recurrence values of the Forest Fire Danger Index (FFDI)²) that can then be used in developing the design bushfire and construction requirements. The GEV analysis predicts the fire weather index and associated fire intensity that will be exceeded in 200 years, based on historic weather observations in the surrounding area.

A major difficulty [for calculating and assessing “design bushfire”] is in defining bushfire scenarios for design and assessment purposes. Inappropriate selections of design bushfire can result in either additional costs to the environment and construction, or the failure of the building systems to withstand the likely fire event. So the question arises, on what basis can the design bushfire be determined. (Douglas and He, 2019)

Bushfire is inevitably harder to accurately predict than other natural disasters including flooding, tsunamis, earthquakes and storms. This is due to the unpredictable nature of how bushfires start. So, responding to bushfires is generally reactive, but planning can consider this inherent risk to achieve a tolerable level of residual risk.

2.3.1 Methodology

The data required to determine the APE is limited to those stations with sufficient records (minimum of 25 years), therefore the closest weather station may not provide the required data to accurately calculate future FFDI. This report has followed the methodology established in Douglas (2014) to determine the APE or recurrence values of FFDI.

Weather and soil moisture data was obtained from the Bureau of Meteorology³. The following weather stations were reviewed for the suitability of their data:

- Station 091104: Launceston Airport Comparison
- Station 091126: Devonport Airport
- Station 091237: Launceston (Ti Tree Bend)
- Station 091291: Sheffield School Farm
- Station 091306: Cressy Research Station
- Station 091311: Launceston Airport
- Station 091375: Cressy (Brumby's Creek)
- Station 096033: Liawenee.

²It is noted that this report references both Fire Danger Index (FDI) and Forest Fire Danger Index (FFDI). An FDI is estimated using the McArthur Fire Danger Meter for grasslands (GFDI) or forest (FFDI). For the purposes of this report, FDI has been estimated using forest. FFDI and FDI can be read interchangeably in this report.

³ The BoM provided weather observation data for the stations listed above as 'DC02D_99999999_10291825' and 'CAS-44793-L8S3X1_GroundMoistureModelData' via email (P. Ward, BoM. pers. comms. 16 February 2023).

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The data⁴ was evaluated based on the following rules:

- Must contain a minimum of 25 years of data.
Cressy Research Station, Launceston Airport, Cressy (Brumbys Creek) and Liawenee were excluded as they do not go back to 1998 (minimum required for 25 years of weather observations). Launceston Airport Comparison was excluded as it stopped recording data in 2009.
- Must contain the data needed to calculate FFDI. This includes maximum daily temperature, relative humidity, time since last rainfall (drought factor), wind speed and direction.
Devonport Airport was excluded due to the likely lack of congruence in weather conditions. The station at Devonport Airport is located on the coast and would be impacted by offshore weather effects to a greater degree than Deloraine.

Further data analysis could be undertaken to compare the relative locations of the weather station⁵ to account for differences in altitude, proximity to the coast and proximity to standing vegetation (or other factors that impact microclimate). The calculation of future FFDI in this assessment follows the methodology established in Douglas (2014), and therefore, the available data is considered sufficient and further analysis is not required.

The weather stations with suitable data are Sheffield School Farm 1996-current and Launceston (Ti Tree Bend) 1980-current. Sheffield School Farm is located approximately 35 km north east of the site and Ti Tree Bend is located approximately 36 km north-west of the site. Ti Tree Bend is located in a developed urban area very close to the Tamar River. The proximity of the station to the river may result in microclimate impacts on observable weather conditions and may not be a reliable indicator of the conditions at the site. Sheffield School Farm is located in an agricultural setting near a small town with little to no standing vegetation in the surrounding 2 km. Calculating the FFDI at Sheffield School Farm is likely to provide the most similar, yet conservative result for calculating future FFDI, and is on the basis that:

- The site is located in an agricultural setting like Sheffield School Farm, however, is closer to standing vegetation (pine plantation north of the site).
- Whilst the proximity of the site to the pine plantation increases the actual risk in a bushfire, the standing vegetation is likely to reduce the FFDI through microclimatic impacts when compared to Sheffield School Farm.

The FFDI was calculated using the following formulae:

Equation $FFDI = 2exp(-0.45+0.987\ln D-0.0345H+0.0338T+0.0234V)$

D drought factor (derived from Keetch-Byram Drought Index)

H relative humidity (%)

V wind speed (kph) at 10 m reference height

T air temperature (degrees Celsius)

⁴ Gaps and missing data

Very few sites have a complete unbroken record of climate information. A site may have been closed, reopened, upgraded to a full weather site or downgraded to a rainfall only site during its existence causing breaks in the record for some or all elements. Some gaps may be for one element due to a damaged instrument, others may be for all elements due to the absence or illness of an observer.

⁵ Additional station data was requested from BoM. No additional data has been provided at this time.

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Drought Factor was only available at Sheffield Farm School from 18 February 1999 reducing the date range to 23 years instead of 25. The available data was processed and then compared to the available data at Cressy Research Station and Launceston Airport Comparison station for accuracy.

Days without sufficient data were eliminated from the analysis. This includes the elimination of days where key variables (i.e. humidity, temperature, wind speed, drought factor) were not recorded.

The highest 20 FFDI values between December 1993 and 15 February 2023 were recorded and ranked, and then a linear regression was applied (as outlined in **Table 5**).

Table 5: Highest 20 FFDI ratings over 20 years based on weather observations from BoM weather stations.

Rank	Sheffield School Farm Station		Cressy Research Station		Launceston Airport Comparison	
	Date	FFDI	Date	FFDI	Date	FFDI
1	9/01/2010	46.27269	29/01/2009	71.88723	29/01/2009	46.62084
2	9/01/2016	38.00537	23/02/2014	50.99149	12/03/1998	45.03854
3	19/01/2016	28.3543	3/02/2000	48.84239	19/02/2000	44.57703
4	19/11/2009	28.03544	30/12/2019	48.72921	6/12/1994	40.24637
5	14/01/2009	27.51073	4/01/2013	47.41215	20/01/2004	34.55799
6	8/02/2015	24.69303	9/01/2010	47.17553	3/02/2000	33.60676
7	1/04/2005	22.85749	7/01/2003	43.09778	12/12/1994	32.52833
8	31/01/2009	22.57041	10/12/2006	43.0051	29/11/2003	32.02212
9	26/12/2019	22.28335	18/02/2000	42.60104	10/12/2006	31.96214
10	19/01/2018	21.96699	20/01/2009	41.89537	9/02/2001	30.96999
11	19/12/2019	21.31972	30/12/2003	41.64443	15/01/2007	30.39162
12	18/02/2000	21.04449	11/01/2008	41.50686	5/12/2006	29.39666
13	23/01/2006	20.93347	22/01/2019	40.3148	20/01/2009	29.36237
14	3/01/2001	20.93009	31/01/2020	40.0998	26/02/1998	29.2851
15	10/04/2007	20.70383	19/12/2019	38.99286	5/01/1997	28.82993
16	1/01/2010	20.45304	9/01/2016	38.41925	2/01/2001	28.24093
17	18/01/2003	19.88566	2/03/2019	37.48267	17/03/2008	28.09969
18	17/02/2004	19.87535	18/01/2018	36.97266	25/01/2003	27.97017
19	31/12/2021	19.80525	3/01/2015	36.75517	1/01/1995	27.57691
20	30/01/2009	19.49518	27/01/2008	36.65312	4/12/2000	27.2877

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2.3.2 Results

The average FFDI in 200 years from 1993 (e.g., 2193) is estimated to be approximately 58, based on the linear regression performed on the FFDI values for Sheffield Farm School Station, and as shown in **Plate 6**.

As the data used for Sheffield Farm School Station was less than 25 years, Cressy Research Station and Launceston Airport Comparison Station have also been assessed (despite them also having less than 25 years of data available). This is intended to compare the results across the three stations based on processing the best available data.

The processed Cressy Research Station data from between 1999-2022 overall returned higher calculated FFDI values, although were generally comparable to Sheffield School Farm and Launceston Airport Comparison stations. This is shown in **Table 5**. An exception is the calculated FFDI 71 for 29 January 2009, which far exceeded all other FFDI values calculated across Sheffield School Farm, Cressy Research, and Launceston Airport Comparison stations, including the same date for Launceston Airport Comparison station.

The weather observations at Cressy Research Station on 29 January 2009 were 38.3°C, 18% relative humidity, wind speed of 46.4 km/h and, a drought factor of 10. It is noted that 29 and 30 January 2009 are currently the hottest days in Tasmania's recorded history. The APE has been calculated and graphed for the Cressy Research station with (**Plate 6**) and without the FFDI of 71 (**Plate 6**), which appears to be an outlier in comparison to the other data processed for three stations. Based on top 20 FFDI values (including FFDI 71), the 1:200 FDI value would be approximately 82.

The weather observations from the Launceston Airport Comparison station were processed to provide another comparison for calculated FFDI given the potential outlier present in the Cressy Research station data, and is shown in **Plate 6**. The Launceston data was limited to 1993-2009 (16 years) and provided a 1:200 FDI value (e.g. from 1993) of approximately 66.

The results support the use of FFDI 80 for calculating BAL ratings as FFDI 50 may underestimate the 1:200 FDI value. Whilst the regression for Cressy Research Station including the hottest day on record exceeds FDI 80, the regression based on that data has the lowest R^2 value of all the regressions completed (**Plate 6**), suggesting that the regression equation does not fit the data well. The Launceston Airport Comparison Station has the highest R^2 value (**Plate 6**), suggesting a good fit, but this station also has the most limited data range.

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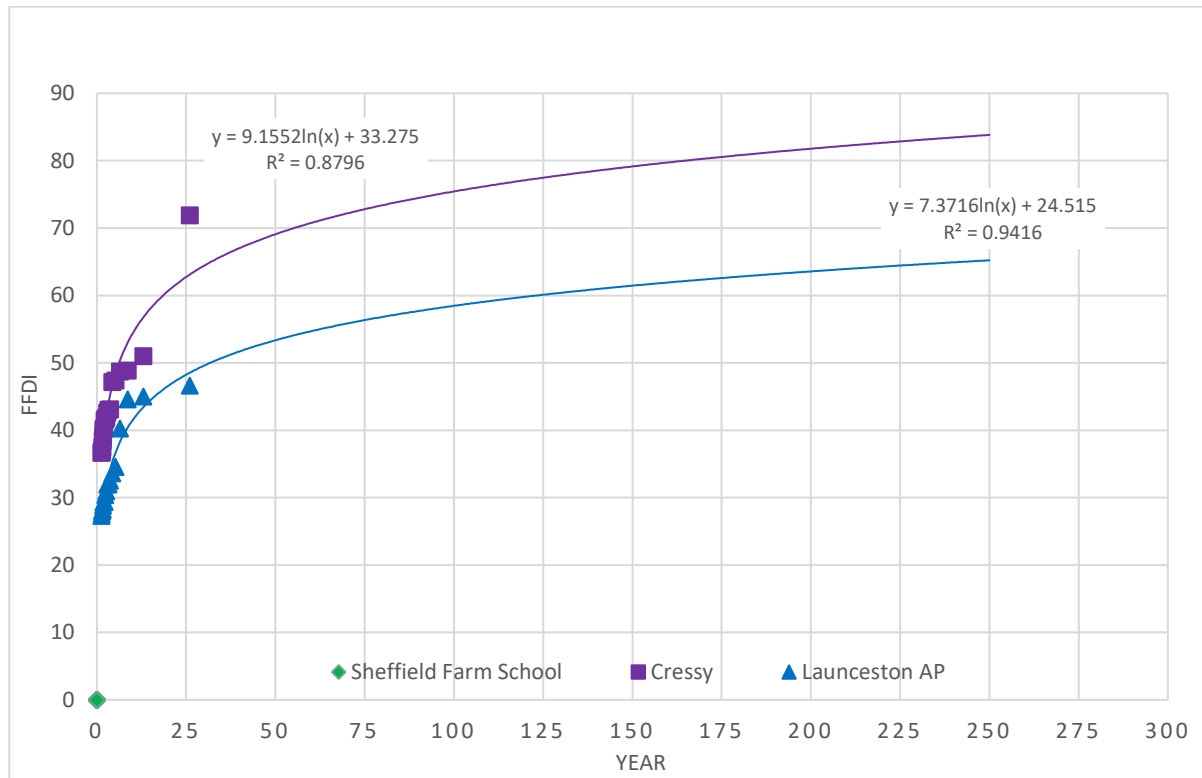


Plate 6: Extreme Value Analysis. Predicting 1:200-year design bushfire using linear regression of FFDI values calculated using weather station observations from 1993-2023.

3 Bushfire Protection Measures

3.1 Mandatory requirements

The following bushfire protection measures must be met to ensure compliance with the applicable provisions of the Bushfire-Prone Areas Code, and the deemed-to-satisfy solutions of the NCC and Director's Determination. These requirements are referenced in the bushfire hazard management plan in **Figure 6**, and demonstrated visually where appropriate. Deviation from these requirements would necessitate the development of a performance-based solution. No performance-based solutions have been explored as part of this BHR.

3.1.1 Design and construction

The location of future buildings has not yet been determined.

Proposed habitable buildings will be required to be constructed to the determined BAL rating under AS 3959. It is likely that the future buildings can achieve a BAL-LOW rating. Buildings subject to BAL-LOW do not require additional construction standards under AS 3959.

If the final location of the buildings is subject to BAL-12.5 then the buildings must be constructed to BAL-12.5 in accordance with AS 3959.

No habitable buildings may be sited subject to a BAL rating greater than BAL-12.5.

3.1.2 Property access

Access to the site has not yet been determined. Access is to be provided in accordance with the requirements of the Director's Determination. The following minimum requirements apply to future access within the site:

- Access from a public road must be provided to within 90 metres of the furthest part of the building measured as a hose lay.
- Access must be provided to the hardstand for the water supply.
- Property access must be designed and constructed in accordance with the following requirements:
 - (a) all-weather construction;
 - (b) load capacity of at least 20 tonnes, including for bridges and culverts;
 - (c) minimum carriageway width of 4 metres;
 - (d) minimum vertical clearance of 4 metres;
 - (e) minimum horizontal clearance of 0.5 metres from the edge of the carriageway;
 - (f) cross falls of less than 3 degrees (1:20 or 5%);
 - (g) dips less than 7 degrees (1:8 or 12.5%) entry and exit angle;
 - (h) curves with a minimum inner radius of 10 metres;
 - (i) maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed roads; and
 - (j) terminate with a turning area for fire appliances provided by one of the following:
 - (i) a turning circle with a minimum outer radius of 10 metres;
 - (ii) a property access encircling the building; or
 - (iii) a hammerhead "T" or "Y" turning head 4 metres wide and 8 metres long.

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- If property access is 200 m long or greater, passing bays of 2 metres additional carriageway width and 20 metres length must be provided every 200 metres.

3.1.3 Water supply for fire fighting

Currently the site is mapped as not being in a reticulated area for water supply. It is understood that it is intended as part of the development that reticulated water be extended into the site.

3.1.3.1 Reticulated water supply

In the event a reticulated water supply can be provided, fire hydrants for firefighting must be provided in accordance with the minimum standards outlined in the Director's Determination. These include:

- The following requirements apply to the provision of water supply within the site:
 - (a) the building area to be protected must be located within 120 metres of a fire hydrant; and
 - (b) the distance must be measured as a hose lay between the firefighting water point and the furthest part of the building area.
- A hardstand area for fire appliances must be provided:
 - (a) no more than three metres from the hydrant measured as a hose lay;
 - (b) no closer than six metres from the building area to be protected;
 - (c) a minimum width of three metres constructed to the same standard as the carriageway; and
 - (d) connected to the property access by a carriageway equivalent to the standard of the property access.
- If reticulated hydrants are able to be provided, the following requirements apply:
 - (a) fire hydrant system must be designed and constructed in accordance with TasWater Supplement to Water Supply Code of Australia WSA 03 – 2011-3.1 MRWA Edition V2.0; and
 - (b) fire hydrants are not installed in parking areas.

3.1.3.2 Static water supply

In the event a reticulated water supply cannot be provided, a static water supply for firefighting purposes must be provided in accordance with the minimum standards outlined in the Director's Determination. These include:

- Distance between building area to be protected and water supply:
 - (a) the building area to be protected must be located within 90 metres of the firefighting water point of a static water supply; and
 - (b) the distance must be measured as a hose lay between the firefighting water point and the furthest part of the building area.
- A static water supply:
 - (a) may have a remotely located offtake connected to the static water supply;
 - (b) maybe a supply for combined use (firefighting and other uses), but the specified minimum quantity of firefighting water must be available at all times;

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- (c) must be a minimum of 10,000⁶ litres per building area to be protected. This volume of water must not be used for any other purpose, including firefighting sprinkler or spray systems;
- (d) must be metal, concrete or lagged by non-combustible materials if above ground; and
- (e) if a tank can be located, so it is shielded in all directions in compliance with Section 3.5 of AS 3959, the tank may be constructed of any material provided that the lowest 400 mm of the tank exterior is protected by:
 - (i) metal;
 - (ii) non-combustible material; or
 - (iii) fibre-cement a minimum of 6 mm thickness.
- Fittings, pipework and accessories (including stands and tank supports) associated with a firefighting water point for a static water supply must:
 - (a) have a minimum nominal internal diameter of 50mm;
 - (b) be fitted with a valve with a minimum nominal internal diameter of 50mm;
 - (c) be metal or lagged by non-combustible materials if above ground;
 - (d) if buried, have a minimum depth of 300mm;
 - (e) provide a DIN or NEN standard forged Storz 65 mm coupling fitted with a suction washer for connection to firefighting equipment;
 - (f) ensure the coupling is accessible and available for connection at all times;
 - (g) ensure the coupling is fitted with a blank cap and securing chain (minimum 220mm length);
 - (h) ensure underground tanks have either an opening at the top of not less than 250mm diameter or a coupling compliant with this Table; and
 - (i) where a remote offtake is installed, ensure the offtake is in a position that is:
 - (i) visible;
 - (ii) accessible to allow connection by firefighting equipment;
 - (iii) at a working height of 450mm – 600mm above ground level; and
 - (iv) protected from possible damage, including damage by vehicles.
- The firefighting water point for a static water supply must be identified by a sign permanently fixed to the exterior of the assembly in a visible location. The sign must:
 - (a) comply with water tank signage requirements within AS 2304; or
 - (b) comply with the TFS Water Supply Signage Guideline.
- A hardstand area for fire appliances must be provided:
 - (a) no more than three metres from the firefighting water point measured as a hose lay (including the minimum water level in dams, swimming pools and the like);
 - (b) no closer than six metres from the building area to be protected;
 - (c) a minimum width of three metres constructed to the same standard as the carriageway; and
 - (d) connected to the property access by a carriageway equivalent to the standard of the property access.

⁶ NB: This quantity is the minimum determined for any habitable building. It is likely that the proposed facility will require additional minimum water supply to be determined during detailed design.

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3.1.4 Hazard management areas

The future habitable buildings must be surrounded by a hazard management area (HMA) with sufficient separation from classified vegetation to achieve BAL-LOW or BAL-12.5. The HMA required to achieve each BAL rating is shown in **Figure 6**. The same width HMA (e.g. 50 m for BAL-LOW or 20 m for BAL-12.5) should be applied regardless of the facility location based on the current vegetation classifications. The HMA and the developable area must be managed in a minimal fuel condition to ensure that radiant heat impacts on the building do not exceed the BAL rating.

Not all vegetation is a classified bushfire risk. Vegetation and ground surfaces that are exempt from classification as a potential hazard are identified as a low threat under Section 2.2.3.2 of AS 3959.

Low threat vegetation includes the following:

- a. Vegetation of any type that is more than 100 m from the site.
- b. Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified.
- c. Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified.
- d. Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified.
- e. Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings, and rocky outcrops.
- f. Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves, and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and wind breaks.

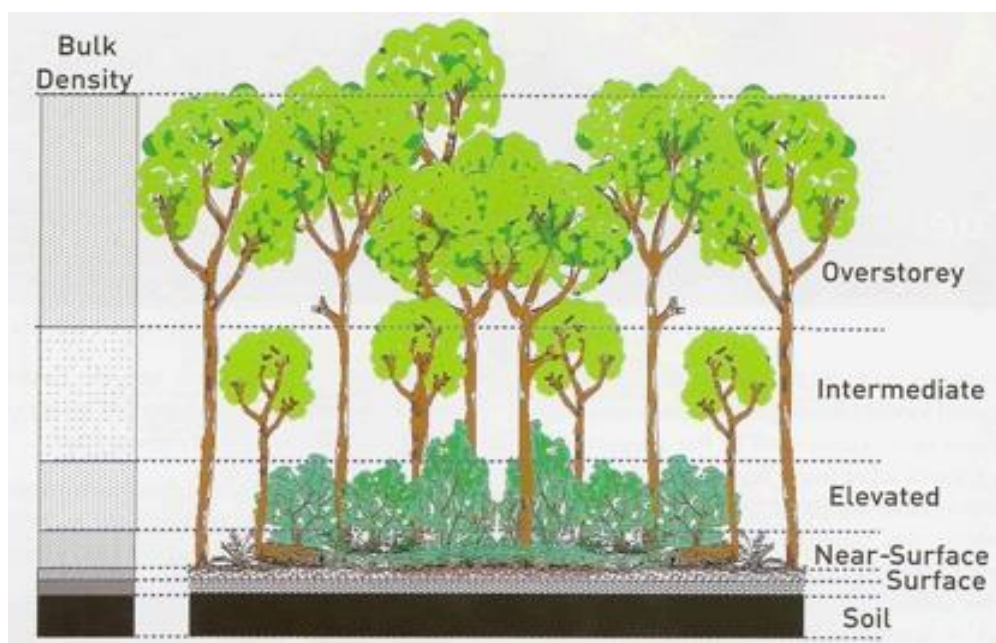


Plate 7: The five fuel layers in a forest environment that could be associated with fire behavior (Gould, McCaw et al. 2007)

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Minimal fuel condition does not mean that no vegetation or landscaping can be provided. The current management of the facility surrounding the existing buildings is considered low threat (minimal fuel condition). There are areas of longer grass (>100 mm in height) within the property (but external to the main facility fencing) that would not be considered low threat. Generally, minimal fuel condition means regularly removing flammable vegetation including pruning/removing tree branches within 2 m of the ground; removing dead matter including accumulated leaf litter; ensuring grass is no more than 100 mm in height; incorporating non-combustible features such as concrete paths around buildings; and choosing high moisture-low flammability plant species. Landscaping approaches could include:

- Plant new trees at least 6 m from buildings. Maintain canopy separation of at least 5 m between mature trees. Note, small clumps of mature trees are acceptable provided they are separated at least 5 m from surrounding canopy. Trees within the HMA can act as ember traps in a bushfire preventing embers from landing on buildings. Windbreaks can also be used to create ember traps. Low threat windbreaks are defined as a single row of trees on the leeward side of the building.
- Small clumps of shrubs (0.5 m or higher in height) up to 10 m² are suitable, however avoid placing shrubs under trees. Shrubs can act as ladder fuels in a bushfire allowing fire to enter the tree canopy, worsening the severity of a bushfire. Separating shrubs from trees prevents incursion of fire into the tree canopy.
- Choose low flammability plants and/or irrigate garden beds to prevent fire catching (Refer to the TFS Fire Retardant Garden Plants' brochure and 'Reducing the Risk in Your Garden' Factsheet). Note, in certain conditions all vegetation is flammable.

Management of the HMA may include:

- Irrigation of grass and garden beds (where required).
- Regular maintenance including removal of weeds and dead material.
- Low pruning of trees (branches below 2 m in height removed where appropriate).
- Application of ground covers such as mulch or non-flammable materials.
- Regularly mowing/slashing of grass to less than 100mm in height.

3.1.5 Emergency planning

The proposed development is a vulnerable use and requires the preparation of a site-specific emergency management plan. An emergency management strategy has been prepared for the site (see **Appendix A**) and is endorsed by the Tasmania Fire Service. An emergency management plan must be prepared for the site in accordance with the Bushfire Emergency Planning Guideline ((TFS 2021)) and be approved by the TFS.

FDI 80 is the most appropriate for the site based on a 1:200-year design bushfire, as detailed in **Section 2.3**. The proposed use of FDI 80 in determining the HMA for the future facility supports its use as a refuge as there will be sufficient defendable space and separation from bushfire-prone vegetation to provide adequate protection.

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4 Planning Compliance

The development of a custodial facility requires assessment against the applicable requirements of the Tasmanian Planning Scheme. **Table 6** addresses compliance of the proposed development against the Bushfire-Prone Areas Code. The proposed custodial facility is considered a vulnerable use, therefore, clause C13.5.1 is applicable and has been addressed in **Table 6** below.

Table 6: Bushfire-Prone Areas Code Compliance Assessment, including consideration of C13.5.1

Acceptable Solution	Performance Criteria	Compliance Statement
A1 No Acceptable Solution.	P1 A vulnerable use must only be located in a bushfire-prone area if a tolerable risk from bushfire can be achieved and maintained, having regard to: the location, characteristics, nature and scale of the use; a) whether there is an overriding benefit to the community; b) whether there is no suitable alternative lower-risk site; c) the emergency management strategy (vulnerable use) and bushfire hazard management plan; and d) other advice, if any, from the TFS.	As there is no acceptable solution for a vulnerable use in bushfire-prone areas, the performance criteria have been addressed. The site is located within an area dominated by agricultural uses. Vegetation within and surrounding the site is predominantly grassland and herbland pasture in varying states of management. There is a pine plantation located to the north of the site located a minimum of 115 m from the northern boundary of the site. The vegetation within the site is able to be managed to minimise the BAL rating for the future buildings. The site is already developed with a custodial facility. This proposal would essentially replace and expand the existing facility to accommodate current and future needs. Custodial facilities are a necessary part of Australian governance that provide a secure facility for rehabilitation thereby providing an overriding benefit to the community. The majority of the state is located within a bushfire prone area, limiting the opportunity to provide a lower-risk site. Further limiting suitable locations is the restriction of custodial facilities within different zoning areas. An alternative site was previously considered for the development; however, it had a higher risk. Therefore, this site is preferable based on multiple factors, including, the low hazard level associated with the extensive grassland in the area. An emergency management strategy for the site has been prepared and endorsed by the TFS and is included as Appendix A. The TFS considers the site to have advantages over the alternative site that was investigated for the project, in that it avoids creating a new vulnerable use (based on consolidating existing land uses) and is large enough to cater for required bushfire protection measures. Advice from the TFS has included consideration of calculating the 1:200-year design bushfire to determine the most appropriate FDI for use in the BAL assessment. The 1:200-year FDI value is 58 (Sheffield Farm School). This supports the use of FDI 80 as a benchmark for appropriate consideration of 'tolerable risk' and determining the HMA for a future vulnerable use refuge building. The calculations of future FDI are based on the FFDI which provides a more conservative assessment of the future FDI (as opposed to using the GFDI).

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Table 6: Bushfire-Prone Areas Code Compliance Assessment (continued)

Acceptable Solution	Performance Criteria	Compliance Statement
A2 An emergency management strategy (vulnerable use) is endorsed by the TFS or accredited person.	P2 No Performance Criterion.	An emergency management strategy has been prepared for the development with shelter-in-place chosen as the primary action in the event of a bushfire. This strategy is included as Appendix A and is endorsed by the TFS. Therefore, the proposal complies with A2.
A3 A bushfire hazard management plan that contains appropriate bushfire protection measures that is certified by the TFS or an accredited person.	P3 No Performance Criterion.	The bushfire hazard management plan (BHMP) has been prepared for the development and is included as Figure 6. This BHMP has been certified by an accredited person. The BHMP must be updated once the development footprint and design is confirmed. Therefore, the proposal complies with A3.

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5 Building Compliance

5.1 National Construction Code

The National Construction Code (NCC) provides a performance-based code for technical design and construction provisions for buildings in Australia. The proposed development must be designed in accordance with the NCC. The NCC is currently within a transition period moving from NCC 2019 to NCC 2022. The relevant version of the NCC will depend on the timing of the design work and building application. However, it is likely that the timeframe for construction will mean that NCC 2022 is the applicable version.

Relevantly, the NCC 2022 provides the requirements for construction in bushfire-prone areas in Part G5 of the Building Code of Australia Volume 1 for Class 2 to Class 9 buildings, and Part H7F4 for Class 1 and associated Class 10a buildings. Residential parts of the facility would be considered Class 3 buildings. The objectives of Part 5, G5O1 (a) and (b) apply to Class 3 buildings.

The NCC 2022 introduces Specification 43 *Bushfire protection for certain Class 9 buildings*. Specification 43 provides additional requirements to increase the safety and tenability of buildings as a shelter in the event of a bushfire. As the proposed buildings are intended to be used to shelter in the event of a bushfire, it is recommended that G5O1 (c) is also satisfied. The deemed-to-satisfy requirement for Class 3 buildings is construction of the building to AS 3959. To satisfy G5O1 (c), compliance with Specification 43 must be demonstrated.

The proposed facility will meet the deemed-to-satisfy (DTS) solutions under the NCC for a facility in FDI 80. As outlined, the APE for the site is FDI 58 (Sheffield Farm School) based on a 1:200-year design bushfire. Therefore, compliance with the minimum requirements for building based on FDI 80 is appropriate for a habitable building in this location.

5.2 Director's Determination – Bushfire Hazard Areas

The *Director's Determination – Bushfire Hazard Areas* (Director's Determination) applies to building work in bushfire-prone areas for Class 1, 2, 3, 8, 9, and 10a buildings. The deemed-to-satisfy solutions relevant to the proposed development are addressed in **Table 7** below.

Table 7: Assessment against the deemed-to-satisfy solutions of the Director's Determination

Deemed-to-satisfy criteria	Proposed solution
2.3.1 Design and construction	
(1) Building work in a bushfire-prone area must be designed and constructed in accordance with either: (a) AS 3959; or (b) NASH Standard - Steel Framed Construction in Bushfire Areas; as appropriate for a BAL determined for that site using Table 2.6 of AS 3959.	Where any part of the proposed development is located subject to a BAL rating greater than BAL-LOW, habitable buildings (and associated Class 10a buildings) will be constructed to the applicable BAL rating in accordance with AS 3959 compliant with clause (1) and (2). The BAL rating has been determined using the minimum distances detailed in Table 2.5 of AS 3959. Table 2.5 requires greater separation from classified vegetation than Table 2.6 as it is based on a higher FDI. This means that the ultimate BAL rating for the development will meet the minimum separation distances of Table 2.6, and provide even more separation from hazards.

Bushfire Hazard Report

Northern Correctional Facility



Table 7: Assessment against the deemed-to-satisfy solutions of the Director's Determination (continued)

Deemed-to-satisfy criteria	Proposed solution
2.3.1 Design and construction (continued)	
(2) Subclause (1)(a) is only applicable to the following: (a) a Class 1, 2 or 3 building; or (b) a Class 10a building or deck associated with a Class 1, 2 or 3 building.	Part of the facility will be used for residence of offenders; therefore, subclause (1) is applicable and has been addressed above.
(3) Subclause (1)(b) is only applicable to the following: (a) a Class 1 building; or (b) a Class 10a building or deck associated with a Class 1 building.	No Class 1 or 10a buildings are proposed; therefore, subclause (3) is not applicable.
(4) Despite subclause (1), permissible variations from requirements specified in subclauses (1)(a) and (1)(b) are as specified in Table 1.	Currently there is no plan to use straw bale construction in the development. The maximum BAL rating for the proposed development will be BAL-12.5. Therefore, the shielding provisions of clause (4) are not applicable.
(5) Despite subclauses (1) and (4), performance requirements for buildings subject to BAL 40 or BAL Flame Zone (BAL-FZ) are not satisfied by compliance with subclauses (1) or (4)	No part of the proposed development will be subject to BAL-40 or BAL-FZ; therefore subclause (5) is not applicable.
2.3.2 Property access	
(1) A new building in a bushfire-prone area must be provided with property access to the building area and the firefighting water point, accessible by a carriageway, designed and constructed as specified in subclause (4).	The proposed development will be provided with property access compliant with subclause (4) as specified in the BHMP.
(2) For an addition or alteration to an existing building in a bushfire-prone area, if there is no property access available, property access must be provided to the building area and the firefighting water point accessible by a carriageway as specified in subclause (4).	The site contains existing buildings that may be retained in the future. There is existing access to those buildings provided.
(3) An addition or alteration to an existing building in a bushfire-prone area must not restrict any existing property access to the building area or the water supply for firefighting.	In the event that the existing buildings are retained and extended or altered, property access will be provided compliant with subclause (4), and will ensure that access to the building and water supply is not restricted.
(4) Vehicular access from a public road to a building must: (a) comply with the property access requirements specified in Table 2; (b) include access from a public road to within 90 metres of the furthest part of the building measured as a hose lay; and (c) include access to the hardstand area for the firefighting water point.	The future development will provide vehicular access in accordance with subclause (4). The required access standards are specified in Section 3.1.2 and enforced in the BHMP (Figure 6). There are no foreseen impediments to providing compliant access.

Bushfire Hazard Report

Northern Correctional Facility



Table 7: Assessment against the deemed-to-satisfy solutions of the Director's Determination (continued)

Deemed-to-satisfy criteria	Proposed solution
2.3.3 Water supply for firefighting	
(1) A new building in a bushfire-prone area must be provided with a water supply dedicated for firefighting purposes which complies with the requirements specified in Table 3A or Table 3B.	The future development will provide a water supply for firefighting in accordance with subclause (1). It is currently unknown whether the site can provide a reticulated water supply. The required water supply standards are specified in Section 3.1.3 and enforced in the BHMP (Figure 6). There are no foreseen impediments to providing a compliant water supply.
2.3.4 Hazard management areas	
(1) A new building, and an existing building, in the case of an addition or alteration to a building, in a bushfire-prone area, must be provided with a hazard management area.	All buildings will be provided with a HMA as required by the BHMP (Figure 6).
(2) The hazard management area must comply with the requirements specified in Table 4.	As the development involves Class 3 buildings and is a vulnerable use, the HMA must meet the following requirements: (a) be located on the lot so as to be provided with HMAs no smaller than the separation distances required for BAL 12.5; and (b) have a HMA established in accordance with a certified bushfire hazard management plan. The site has sufficient area to provide a compliant HMA. The requirements for the HMA are detailed in Section 3.1.4 and enforced in the BHMP (Figure 6).
(3) The hazard management area for a particular BAL must have the minimum dimensions required for the separation distances specified for that BAL in Table 2.6 of AS 3959.	The HMA will use the minimum dimensions from Table 2.5 of AS 3959, which are greater than those of Table 2.6. This is because the development is being assessed against a higher FDI (FDI 80, compared to the typical FDI 50) as a conservative approach to managing risk for future development. The dimensions of the minimum HMA required are demonstrated and enforced in the BHMP (Figure 6).
(4) The hazard management area must be established and maintained such that fuels are reduced sufficiently, and other hazards are removed such that the fuels and other hazards do not significantly contribute to the bushfire attack.	The HMA is required to be maintained in a minimal fuel condition in accordance with section 2.2.3.2 of AS 3959. The management requirements for the HMA are detailed in Section 3.1.4 and enforced in the BHMP (Figure 6).
2.3.5 Bushfire emergency plan	
(1) A bushfire emergency plan must be prepared for: <i>(a)</i> a new building; <i>(b)</i> an existing building in the case of an addition or alteration to a building; <i>(c)</i> an existing building in the case of a change of building class; <i>(d)</i> a building associated with the use, handling, generation or storage of a hazardous chemical or explosive; in a bushfire-prone area.	The proposed development is supported by an endorsed emergency management strategy, which will be developed into a bushfire emergency plan prior to occupation. The proposed strategy includes the primary action of shelter-in-place due to the nature of the facility. There are no foreseen impediments to providing compliant access.
(2) A bushfire emergency plan must comply with the requirements specified in Table 5.	A bushfire emergency plan must be developed for the site, which is: (a) consistent with the Bushfire Emergency Planning Guideline; and (b) approved by the TFS or a person accredited by the TFS. There are no foreseen impediments to providing a compliant bushfire emergency plan.

Bushfire Hazard Report

Northern Correctional Facility



6 Future Approval Considerations

The BAL assessment is a conservative and cautious assessment of the potential bushfire risk posed to future habitable buildings within the site based on the proposed management of vegetation and assumptions outlined in **Section 2**. This includes undertaking the BAL assessment using an FDI 80 to satisfy the 1:200 APE FDI value.

NCC Specification 43 provides additional requirements to increase the safety and tenability of buildings as a shelter in the event of a bushfire. As the proposed buildings are intended to be used to shelter in the event of a bushfire, it is recommended that G501 (c) is also satisfied. The deemed-to-satisfy requirement for Class 3 buildings is construction of the building to AS 3959. To satisfy G501 (c), compliance with Specification 43 must be demonstrated.

Construction to fire resistance level (FRL) under the NCC alone does not meet the requirements for BAL-FZ construction, and ember proofing is not covered by the FRL. It is highly recommended that ember proofing be provided for any future buildings within the site.

The location of the proposed buildings, access and water supply will be determined following preliminary investigations as part of due diligence work for the development.

This bushfire hazard report can be updated to address the development layout once determined and confirm that the proposal complies with all relevant requirements. The updated report will include a planning certificate that can be used to support the submission of a development application for the building.

An emergency management plan will need to be prepared for the development as part of the development application process and will need to be endorsed by the TFS.

A building certificate detailing the bushfire hazard will be required as part of the building application process. This certificate can be prepared as part of the development application process.

Bushfire Hazard Report

Northern Correctional Facility



7 Responsibilities for Implementation and Management of Bushfire Protection Measures

Table 8 outlines the responsibilities of the proponent (developer) and future landowners associated with implementing this bushfire hazard report and the BHMP with reference to ongoing bushfire risk mitigation measures. These responsibilities will need to be considered as part of the subsequent development and implementation process.

Table 8: Responsibilities for the implementation of this bushfire hazard report

Proponent		
No.	Implementation action	Timing
1	Determine the location of buildings as part of the design process to ensure BAL-12.5 is not exceeded. It is recommended that buildings be located to achieve BAL-LOW.	Prior to lodgement of development application
2	Provide compliant access as part of the design of the facility in accordance with the bushfire hazard management plan.	Prior to lodgement of development application
4	Implement and maintain the hazard management area (HMA) to a low threat standard in accordance with Section 2.2.3.2 of AS 3959. The dimensions of the hazard management area must comply with the bushfire hazard management plan.	Construction
5	Reticulated water supply and hydrants are to be installed in accordance with TasWater requirements and the Director's Determination as required under the BHMP.	Construction
6	Prepare an emergency management plan to be endorsed by the TFS in accordance with the bushfire hazard management plan.	Prior to occupation
7	Maintain the hazard management area (HMA) to a low threat standard in accordance with Section 2.2.3.2 of AS 3959 and the bushfire hazard management plan.	Ongoing
8	Review and update the emergency management plan on an annual basis, as a minimum.	Ongoing

Bushfire Hazard Report

Northern Correctional Facility



8 Applicant Declaration

8.1 Accreditation

This assessment report has been prepared by Emerge Associates. Dana Elphinstone is an accredited Bushfire Hazard Practitioner in Tasmania (BFP-146), with over seven years of experience. Dana also holds Level 2 Bushfire Planning and Design (BPAD) accreditation (BPAD No. 52565) in Western Australia and is supported by team members who have undertaken BPAD Level 1 and Level 2 training and are working towards becoming accredited practitioners. Emerge Associates have been providing bushfire risk management advice for more than 10 years, undertaking detailed bushfire assessments (and associated approvals) to support the land use development industry.

8.2 Declaration

I declare that the information provided is true and correct to the best of my knowledge.

Signature:

A handwritten signature in black ink that reads "Dana E".

Name: Dana Elphinstone

Company: Emerge Associates

Date: 4 May 2023

Accreditation: BFP-146 (Scope 1, 2, 3A, 3B, 3C)

Bushfire Hazard Report

Northern Correctional Facility



9 References

9.1 General references

The references listed below have been considered as part of preparing this document.

DoJ (2021). *Director's Determination - Bushfire Hazard Areas*. Department of Justice. Tasmania.

Douglas, G., He, Y. Yang, X., and Morris, E. C. (2014) "Use of the Extreme Value Analysis in Determining Annual Probability of Exceedance for Bushfire Protection Design." *Proceedings of the 11th International Symposium on Fire Safety Science* **11**, 1379-1392.

Gould, J., W. McCaw, N. Cheney, P. Ellis and S. Matthews (2007). *Field Guide: Fuel Assessment and Fire Behaviour Prediction in Dry Eucalypt Forest*. Perth, Western Australia, CSIRO and Department of Environment and Conservation.

Standards Australia (2010). *Australian Standard 3745-2010 Planning for emergencies in facilities (AS 3745-2010)*. Sydney, SAI Global Limited.

Tasmania Fire Service (2021). *Bushfire Emergency Planning Guideline*, Version 3.0. B. R. Mitigation. Hobart, Tasmania Fire Service.

9.2 Online references

The online resources that have been utilised in the preparation of this report are referenced in **Section 9.1**, with access date information provided in **Table R-1**.

Table R 1 Access dates for online references

Reference	Date accessed	Website or dataset name
(LISTMap)	7 September 2022	The LIST

Figures



Figure 1: Site Location and Topographic Contours

*Figure 2: AS 3959 Vegetation Classifications and Effective Slope – BAL - LOW
Hazard Management Area (50m wide)*

Figure 3: BAL Contour Plan – BAL - LOW Hazard Management Area (50m wide)

*Figure 4: AS 3959 Vegetation Classifications and Effective Slope – BAL - 12.5
Hazard Management Area (20m wide)*

Figure 5: BAL Contour Plan – BAL - 12.5 Hazard Management Area (20m wide)

Figure 6: Bushfire Hazard Management Plan

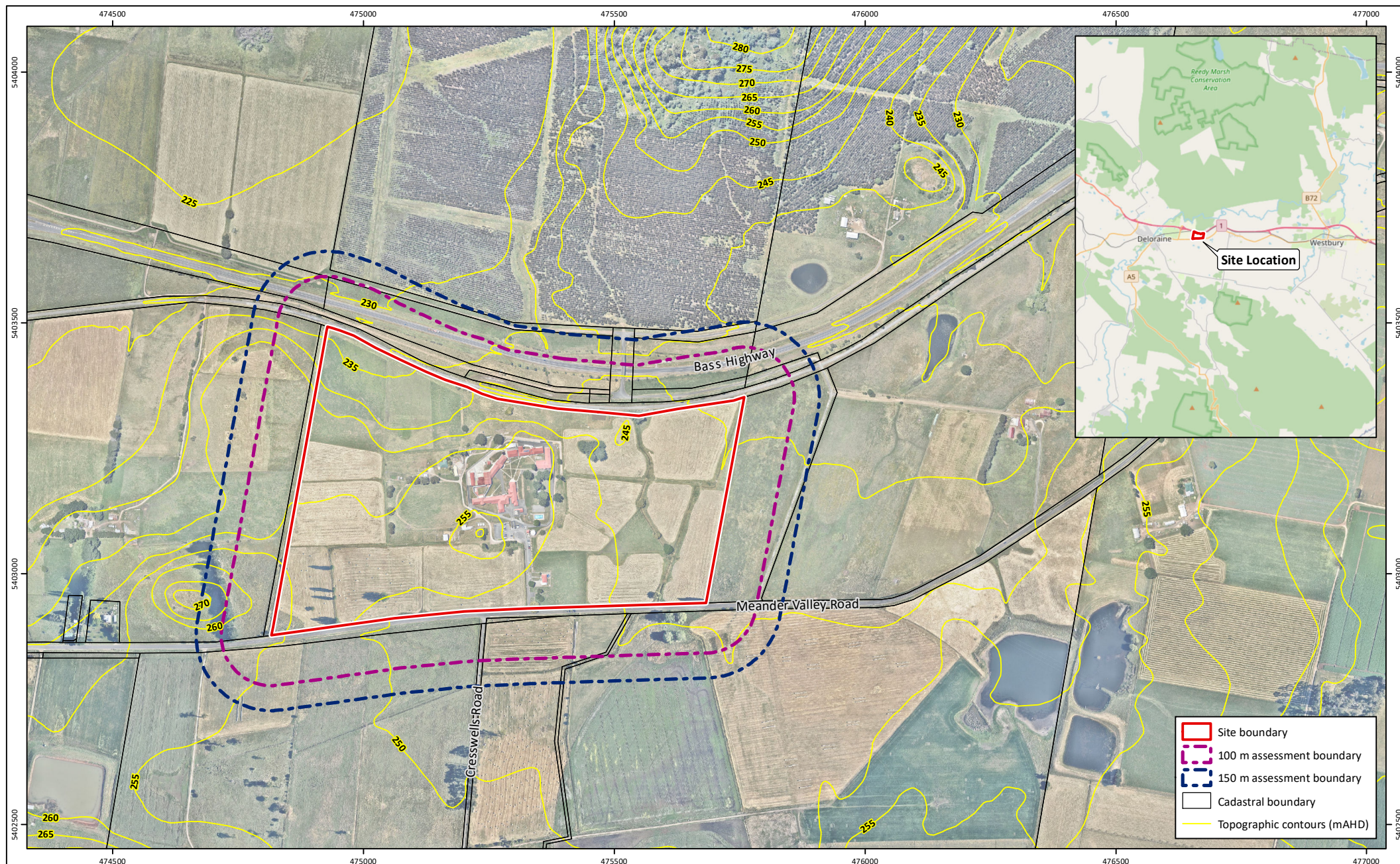


Figure 1: Site Location and Topography

Project: Bushfire Hazard Report
Northern Correctional Facility
Client: Department of Justice

Plan Number:
EP22-070(01)-F01
Drawn: GAR
Date: 28/09/2022
Checked: KK
Approved: DAE
Date: 13/12/2022



0 100 200 300
Metres
Scale: 1:10,000@A4
GDA 1994 MGA Zone 55

emerge
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**Figure 2: AS 3959 Vegetation Classification and Effective Slope
BAL - LOW Hazard Management Area (50m wide)**

Project: Bushfire Hazard Report
Northern Correctional Facility
Client: Department of Justice

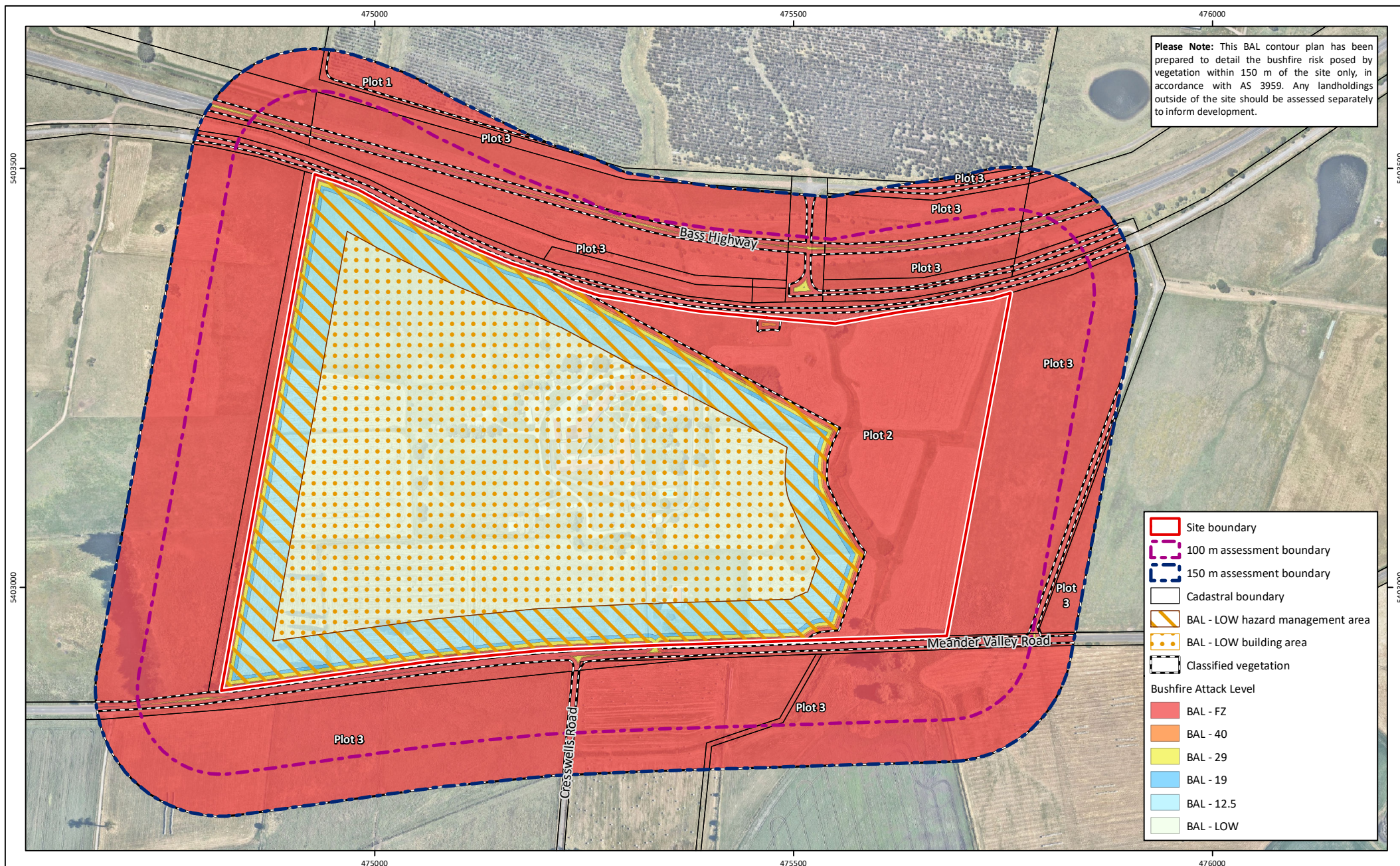
Plan Number:
EP22-070(01)-F02
Drawn: GAR
Date: 28/09/2022
Checked: KK
Approved: DAE
Date: 13/12/2022



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Metres

Scale: 1:6,000@A4
GDA 1994 MGA Zone 55

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**Figure 3: Bushfire Attack Level Contour Plan
BAL - LOW Hazard Management Area (50m wide)**

Project: Bushfire Hazard Report
Northern Correctional Facility
Client: Department of Justice

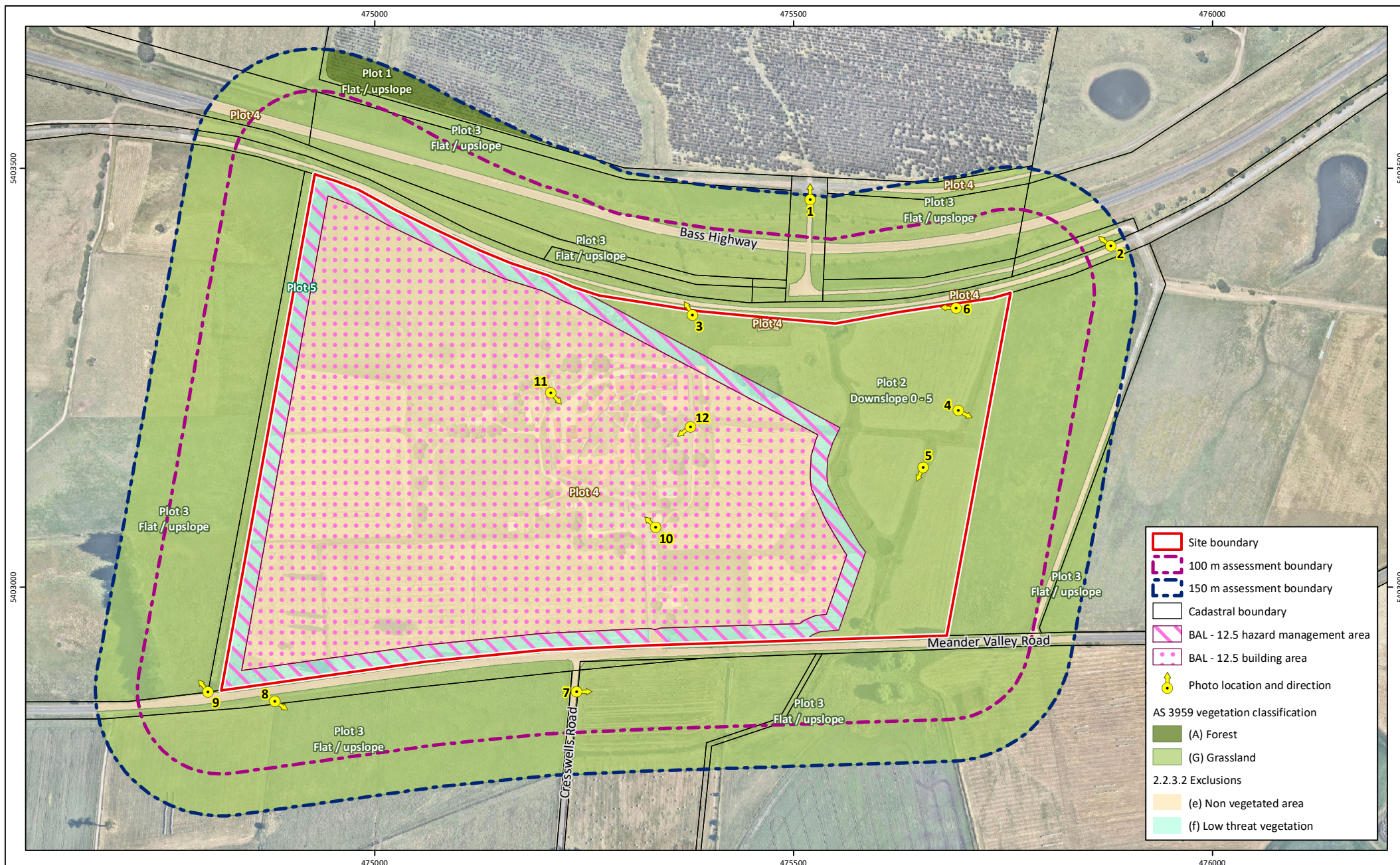
Plan Number:
EP22-070(01)-F03
Drawn: GAR
Date: 28/09/2022
Checked: KK
Approved: DAE
Date: 13/12/2022



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Metres

Scale: 1:6,000@A4
GDA 1994 MGA Zone 55

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ASSOCIATES



**Figure 4: AS 3959 Vegetation Classification and Effective Slope
BAL - 12.5 Hazard Management Area (20m wide)**

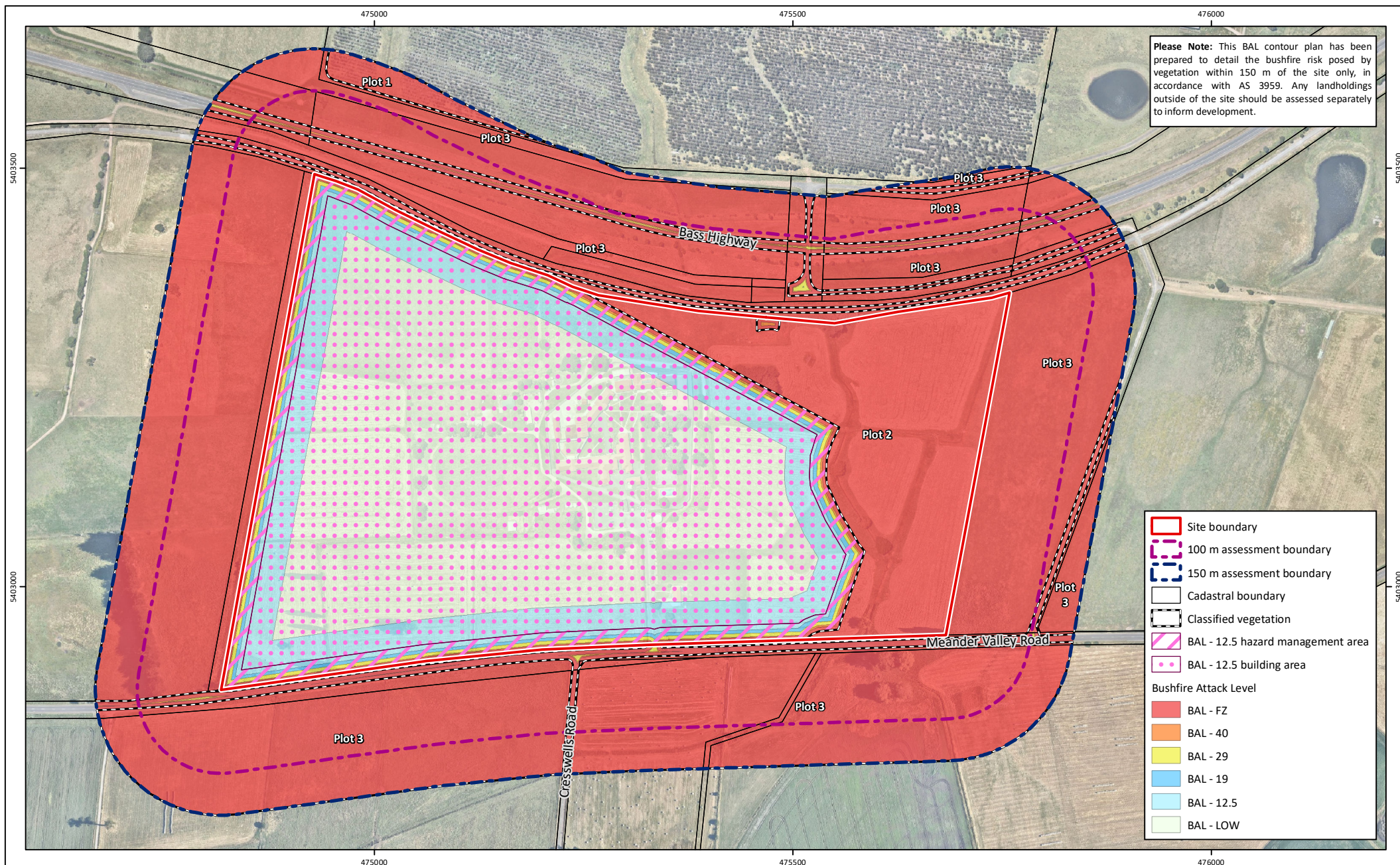
Project: Bushfire Hazard Report
Northern Correctional Facility
Client: Department of Justice

Plan Number:
EP22-070(01)-F04
Drawn: GAR
Date: 28/09/2022
Checked: KK
Approved: DAE
Date: 13/12/2022



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Metres
Scale: 1:6,000@A4
GDA 1994 MGA Zone 55

emerge
ASSOCIATES



**Figure 5: Bushfire Attack Level Contour Plan
BAL - 12.5 Hazard Management Area (20m wide)**

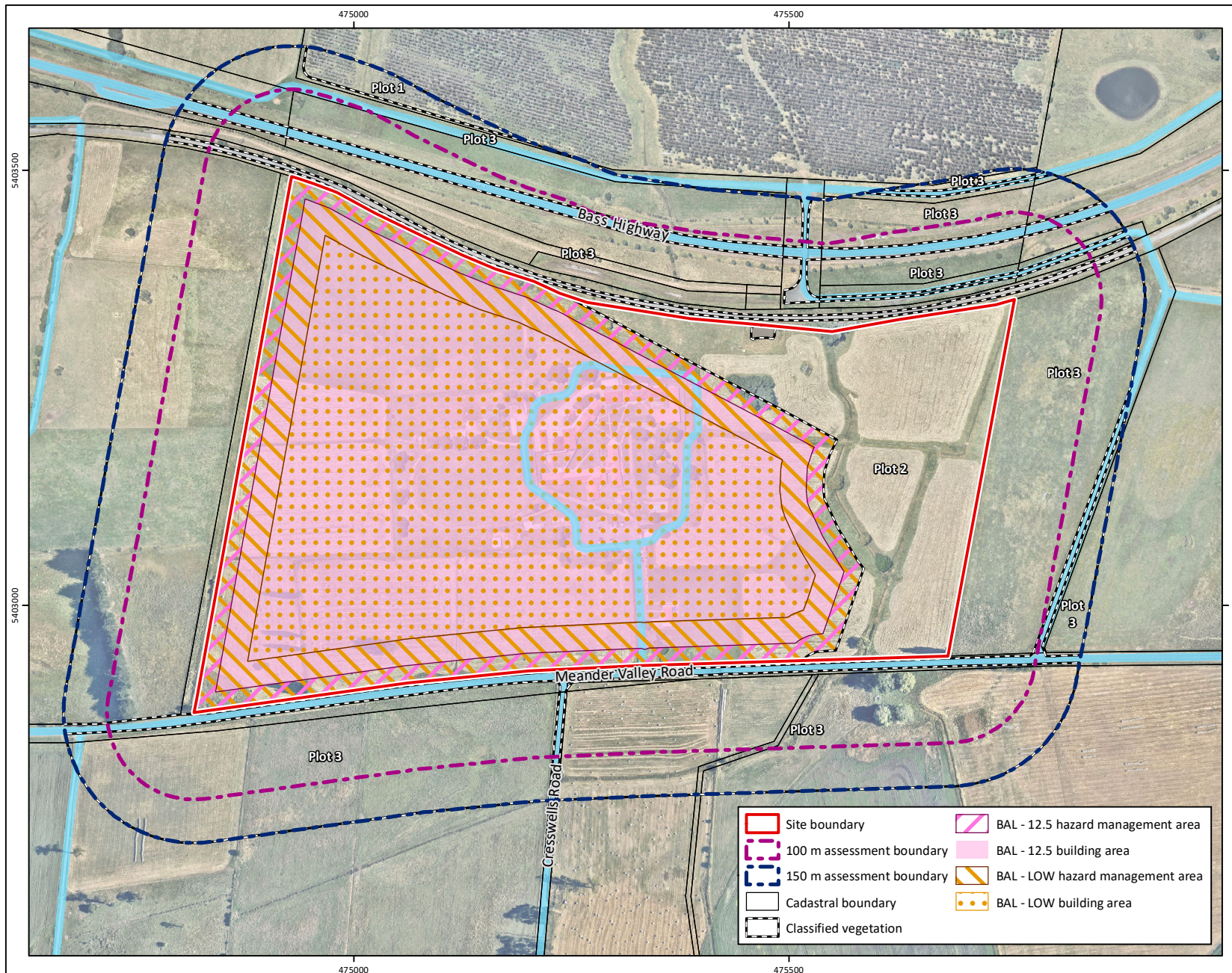
Project: Bushfire Hazard Report
Northern Correctional Facility
Client: Department of Justice

Plan Number:
EP22-070(01)-F05
Drawn: GAR
Date: 28/09/2022
Checked: KK
Approved: DAE
Date: 13/12/2022



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Metres
Scale: 1:6,000@A4
GDA 1994 MGA Zone 55

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Property Information

Street Address: 4260 Meander Valley Road, Deloraine
Title Reference: 12/6765
Existing and Proposed Use: Custodial facility

Bushfire Hazard Practitioner

Name: Dana Elphinstone
Accreditation No.: BFP-146
Scope: 1, 2, 3A, 3B and 3C

Bushfire Protection Measures

1. Hazard Management Area:

- Two hazard management areas (HMA) are shown to provide flexibility for the location of future buildings. The choice to provide a BAL-LOW or BAL-12.5 HMA is at the developer's discretion, however it is recommended that the BAL-LOW HMA be provided.
- Hazard Management Areas must be maintained in accordance with the requirements specified in Section 3.1 of the Bushfire Hazard Report in order to mitigate the spread of fire to buildings and provide defensible space.

2. Access:

Access within the site must comply with the minimum specifications detailed in Section 3.1 of the Bushfire Hazard Report.

3. Water Supply:

Fire hydrant provision and coverage must comply with Section 5.1 of the Bushfire Hazard Report.

4. Construction Standard:

- Future buildings sited to achieve BAL-LOW do not require any additional construction standards under AS 3959.
- Future buildings sited to achieve BAL-12.5 must be constructed to BAL-12.5 in accordance with AS 3959. If the HMA chosen by the developer is for BAL-12.5, then all habitable building are required to be constructed to BAL-12.5.
- No buildings are to be sited such that they exceed BAL-12.5.
- Non-habitable buildings may be located outside of the indicative development area and are not required to be constructed to AS 3959 unless within 6 m of a habitable building.

5. Bushfire Emergency Plan

A Bushfire Emergency Plan must be prepared and endorsed by the Tasmania Fire Service prior to occupation of the site. The Bushfire Emergency Plan must be implemented and reviewed annually, and following any bushfire emergency.

This BHMP must be read in conjunction with the Bushfire Hazard Report File No. EP22-070(01)—001 (Emerge Associates, September 2022).

Figure 6: Bushfire Hazard Management Plan

Project: Bushfire Hazard Report
Northern Correctional Facility
Client: Department of Justice

Plan Number:
EP22-070(01)—F06
Drawn: GAR
Date: 30/09/2022
Checked: KK
Approved: DAE
Date: 13/12/2022



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Metres
Scale: 1:6,500@A4
GDA 1994 MGA Zone 50

Appendix A

Emergency Management Strategy



Bushfire Hazard Report Northern Correctional Facility



Appendix A: Emergency Management Strategy

Introduction

A future correctional facility housing up to 270 residents and associated staff and visitors is proposed at 4260 Meander Valley Road, Deloraine. Vulnerable use development in a bushfire-prone area is required to be supported by a bushfire emergency plan endorsed by the Tasmania Fire Service. It is often difficult to provide full details of the bushfire emergency plan prior to the submission of planning applications. Therefore, compliance with the Bushfire-Prone Areas Code of the Tasmanian Planning Scheme requires the development of an emergency management strategy that will inform the future bushfire emergency plan.

This strategy has considered the specific requirements outlined within the *Bushfire Emergency Planning Guideline* (Tasmania Fire Service 2021). The relevant requirements of the Bushfire Emergency Planning Guidelines have been addressed in this strategy and will need to be considered as part of preparing a future bushfire emergency plan, with the key factors detailed in **Table A1**, and the proposed emergency response discussed overleaf. It is noted that a risk analysis was not required for this strategy; future development will demonstrate compliance with the National Construction Code (NCC) for a refuge building using FDI 80 to ensure that a tolerable level of residual risk is achieved.

Emergency management key factors

Table A1: Emergency management strategy requirements

Factor	Strategy
Occupancy characteristics e.g., number of occupants, age profile, disability, mobility and health considerations, communication constraints	The proposed development is a custodial facility with capacity for up to 270 residents with associated staff. Occupants of the facility are likely to include a range of age profiles, disabilities, mobility and health considerations. Communication is restricted for most occupants, with staff having access to a wider range of communication methods.
Emergency management structure and capability e.g., characteristics and capacity of the Emergency Control Organisation (ECO), response and intervention teams	The facility will establish an Emergency Planning Committee and Emergency Control Organisation in accordance with AS 3745: Planning for emergencies in facilities (Standards Australia 2010).
Building(s) and site vulnerability e.g., construction, design, access, firefighting water supply, proximity to hazard, landscaping	The development will be located within a site that can provide hazard management areas equivalent to BAL-LOW, with the predominant bushfire hazard being grassland within and surrounding the site. Future buildings within the site will be surrounded by a minimum BAL-12.5 equivalent Hazard Management Area (HMA). This reduces the risk to the building from direct flame contact and radiant heat exceeding 12.5 kW/m². Depending on the nature of the bushfire, there is also less impact from embers and burning debris. The correctional facility will be designed to conform with air-handling systems compliant with the NCC, which further supports the use of a shelter-in-place strategy.

Bushfire Hazard Report

Northern Correctional Facility



Table A1: Emergency management strategy requirements (continued)

Factor	Strategy
Complimentary bushfire protection strategies	No complimentary bushfire protection strategies have been decided at this stage. This will be considered during future design stages. The Deloraine Fire Station is located approximately 5 km west of the site, which is approximately six (6) to seven (7) minutes by vehicle when travelling at 50 km/h. The Westbury Fire Station is located approximately 12 km east of the site, which is approximately 12 minutes by vehicle when travelling at 60 km/h. The plantation forest to the north of the site is registered as an asset in the local Fire Management Area Committee Bushfire Risk Management Plan.
Possible bushfire scenarios e.g. nature of the hazard, fire weather, landscape fire risk, fire path, on-site ignition potential	There two primary bushfire scenarios for the site are: 1. Grassland fire in adjoining rural pasture; and 2. Forest fire in plantation area north of Bass Highway. These types of fires are very different in behaviour and thus the response to each scenario will be different. Grassland fires have low residence time due to the lower fuel load and structure of the fuel. This means a fire will move swiftly and the hazard will only remain for a short period of time. Commonly, custodial facilities are built to higher construction standards than what is required under AS 3959 for BAL-12.5¹ and below. In the event of a grass fire, shelter-in-place is the most logical option due to the reduced impact and increased time required to move occupants safely. Forest fires have longer residence time and produce more embers and burning debris. They also produce greater radiant heat requiring greater separation from vulnerable assets at the equivalent BAL rating when compared to other classified vegetation. In this scenario, shelter-in-place would be the primary response with constant assessment of the situation to determine whether evacuation is possible., The plantation forest has limited understorey as it is a monoculture supporting timber production. This will alter typical forest fire behaviour as the understorey fuel load is atypical.
Primary and contingency bushfire safety options e.g., evacuation and shelter options analysis;	Shelter-in-place is considered the most appropriate primary action due to nature of the facility and challenges associated with moving occupants to a safer place. It is likely that shelter-in-place will be the only suitable response for a facility of this kind. Contingency planning may consider the allocation of an alternative facility able to house the occupants safely with consideration given to timing of evacuation and transport for occupants. The decision to move to evacuation will be in response to forecast fire danger rating and/or direct instruction from emergency services. In the unlikely event that evacuation is considered safe, evacuation would occur via vehicle along Meander Valley Road, south of the site. This is the opposite direction to the fire front in this scenario ensuring occupants are not evacuated towards the fire front.
Firefighter access, firefighting services and firefighter protection	The future facility will be designed to comply with the <i>Director's Determination – Bushfire Hazard Areas</i> (DoJ 2021). This will determine the firefighter access, firefighting services and firefighter protection. The future facility will provide vehicle access suitable for fire appliances, a reticulated water supply for fire fighting purposes, and a hazard management area managed to a minimal fuel condition, providing defensible space around the facility.
Likelihood and consequence if hazardous materials or explosives are impacted by fire	If hazardous materials are to be stored onsite they will be located external to the HMA and managed in accordance with state and federal laws.

Bushfire Hazard Report

Northern Correctional Facility



Emergency management response and rationale

Based on the detail identified as part of **Table A1**, a shelter-in-place emergency management response is considered the most appropriate for the site due to the nature of the occupants and challenges associated with an efficient, safe evacuation. Therefore, the primary response to a bushfire event will be to shelter-in-place within the buildings on the site. This is considered the best option in the event of normal bushfire conditions.

The proposed facility will also be required to ensure that the onsite refuge meets the requirements of the National Construction Code based on a Fire Danger Index (FDI) of 80 for defining the minimum separation needed from bushfire-prone vegetation, providing a best practice response for a vulnerable use refuge at this location.

Evacuation is unlikely to be a suitable option for the site but could be considered as a secondary (contingency) response on advice from emergency services. The decision to evacuate will depend on the magnitude and context of the bushfire. The location of the facility and surrounding vegetation suggest that a grass fire would not require evacuation. Monitoring of a forest fire from the north will be required as this type of fire will be more hazardous. However, the closest forest is located 120 m from the site boundary. This means future buildings would have a minimum separation of 170 m from forest if a BAL-LOW hazard management area (HMA) is implemented, or 140 m if a BAL-12.5 HMA is implemented. This reduces the likelihood of the facility being impacted by bushfire, although embers and smoke will still be a consideration.

The majority of occupants in the facility will reside within future buildings. Therefore, there is sufficient capacity to accommodate occupants, staff and visitors.

Building construction will be determined by any BAL ratings applicable to the future buildings. To demonstrate that the building is suitable for an on-site refuge the BAL rating for the refuge building/s should use an FDI of 80 under the methodology in AS 3959, the requirements for onsite refuge tenability outlined in the NCC, and any other relevant construction standards applicable to building of this nature. The construction standard is considered to provide adequate protection from the effects of bushfire. To ensure the future facility is suitable for use as a refuge, Specification 43 of the NCC 2022 has been addressed insofar as to consider the Annual Probability of Exceedance (APE) for the 1:200 year FDI value. This has shown that the facility could be subject to more intense bushfire in 200 years' time due to the changing climate. To provide future proofing for the facility, an FDI of 80 has been used to determine the measures required to achieve a tolerable residual risk. The use of FDI 80 for the facility provides for safe construction into the future. The FDI used is based on the established requirements for FDI 80 in AS 3959, and the calculation of the 1:200 APE FDI value (refer to Section 2.3 of the Bushfire Hazard Report (main report) for further detail). The use of an FDI of 80 is based on the extreme value analysis which calculated an FFDI of 58 to 82, noting that the higher FFDI of 82 is highly influenced by the FFDI calculated at Cressy Research Station on 29 January 2009 which is an outlier to the data analysed overall. The 29th and 30th of January 2009 are currently the hottest days ever in recorded history in Tasmania, and a similar FFDI was not calculated for Launceston Airport Comparison Station on the same day.

Bushfire Hazard Report

Northern Correctional Facility



The site is located in an open rural area with scant standing vegetation between the site and major roads to the north and south. There is some undulation of the site that slightly reduces visibility across the site as a whole. The site is already used for a custodial facility. Based on the above factors the site is considered easily accessible and identifiable for emergency services and emergency management.

Development in a bushfire-prone area that is not a vulnerable or high-risk use is able to achieve tolerable risk by complying with the acceptable solution of the Bushfire-Prone Areas Code, the Director's Determination, and the AS 3959. Vulnerable and high-risk land use have additional factors that require greater consideration of how to achieve a tolerable risk. In the case of vulnerable use, occupants are considered less capable to respond independently in an emergency. The proposed facility will house occupants that have restrictions placed on their freedom of movement outside the facility. Some occupants may also have additional considerations that reduce their ability to respond such as disabilities, health conditions, and mobility issues. Therefore, the coordination and movement of occupants will rely heavily on staff and the efficiency and safety of evacuation may be impacted beyond what is expected of other land uses. For this reason, shelter-in-place is considered the most appropriate primary action.

Shelter-in-place provides benefits that are considered to outweigh the risks of evacuation for a facility of this type. The risks associated with shelter-in-place can be reduced through compliance with the Director's Determination and the NCC, and the establishment of emergency management procedures which provide considered responses to potential risks prior to an emergency event. The emergency plan should pre-empt likely hazards and risks and provide commensurate responses to ensure the safety of people and property. This should be addressed in the future bushfire emergency plan.

¹ BAL-12.5 is the maximum acceptable BAL rating for new Class 9 building development in Tasmania without employing a performance solution

Bushfire Hazard Report
Northern Correctional Facility

TFS Endorsement of Emergency Management Strategy

Dana Elphinstone

From: Bushfire Practitioner <bfp@fire.tas.gov.au>
Sent: Monday, 8 May 2023 6:51 AM
To: Dana Elphinstone
Cc: Bushfire Practitioner
Subject: RE: BFP-146 - Northern Correctional Facility

Dear Dana,

I can confirm TFS endorses your emergency management strategy (supplied to TFS on 3 May 2023).

Please include a copy of this advice in support of your assessment.

Regards,

Tom O'Connor
Senior Planning & Assessment Officer
Bushfire Risk Unit

Tasmania Fire Service

Service | Professionalism | Integrity | Consideration

Cnr Argyle and Melville Streets | GPO Box 308 Hobart Tasmania 7001
Phone 0438 101 367
tom.oconnor@fire.tas.gov.au | www.fire.tas.gov.au