Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lot 7779 Wannamal Road West, Cullalla

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 30 Month November Year 2021

Report author or reviewer: Mike Scott

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner ☑

If accredited please provide the following.

BPAD accreditation number: 27795 Accreditation expiry: Month February Year 2025

Bushfire management plan version number: v1.2

Bushfire management plan date: Day 12 Month March Year 2024

Client/business name: Statewest Planning - Simon O'hara

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		✔
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?		✔

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✔
Strategic planning proposal (including rezoning applications)		✔
High risk land-use	✔	
Vulnerable land-use		✔

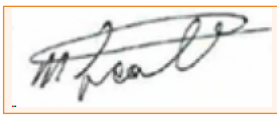
None of the above ☐

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The proposal is a Composting Facility. The Shire of Gingin has assessed the proposal as a High-Risk Land Use due to the availability of flammable materials and the processes applied.

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

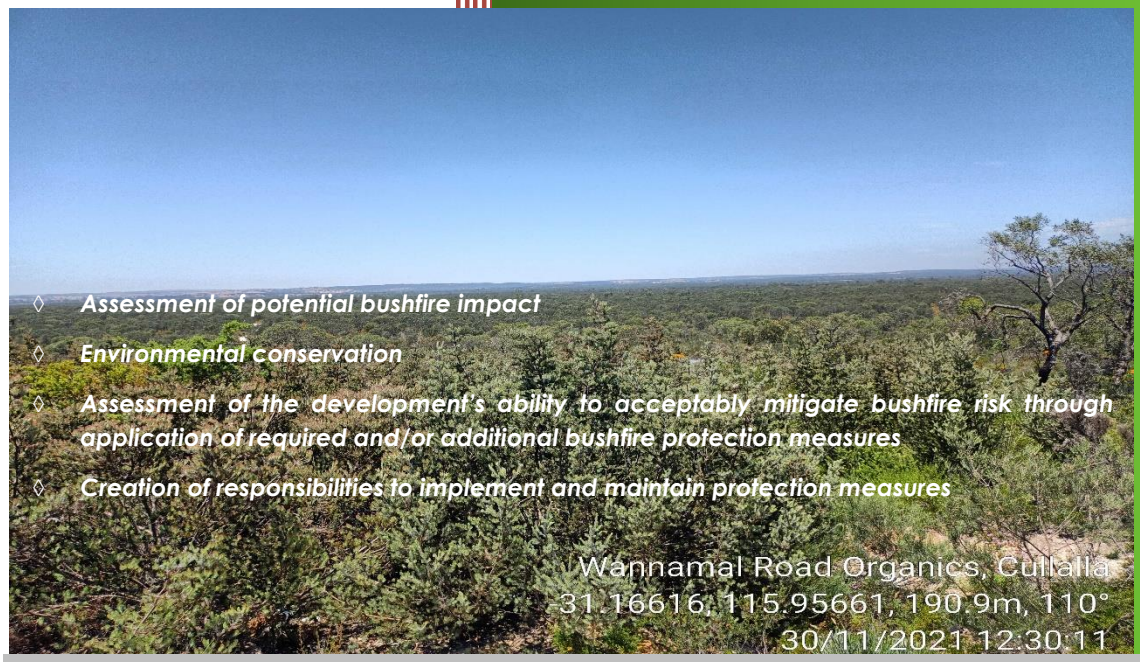
Signature of report author or reviewer 

Date 12/03/2024

BUSHFIRE PRONE PLANNING

Wannamal Road Organics

Bushfire Management Plan (BMP)



Produced to meet the relevant requirements of STATE PLANNING POLICY 3.7 Planning in Bushfire Prone Areas & Guidelines

Address / Location: Lot 7779 Wannamal Road West, Cullalla

Shire of Gingin

Development Application

12 March 2024

Job Reference No: 211042

BPP GROUP PTY LTD T/A BUSHFIRE PRONE PLANNING

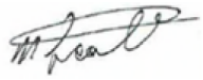
ACN: 39 166 551 784 | ABN: 39 166 551 784

SUITE 11, 36 JOHNSON STREET
GUILDFORD WA 6055

PO BOX 388
GUILDFORD WA 6935

08 6477 1144 | admin@bushfireprone.com.au

DOCUMENT CONTROL

PREPARATION		
Author:	Sarina Gorman (BPAD Level 2 No. 42204)	
Reviewed:	Mike Scott (BPAD Level 3 No. 27795)	

VERSION HISTORY		
Version	Status/Details	Date
1.1	Draft For Comment	1 March 2024
1.2	Final Document Issue	12 March 2024

DISTRIBUTION					
Destination		Version	No. Copies	Hard Copy	Electronic Copy
Person	Email				
Simon O'hara – Statewest Planning	simon.ohara@statewestplanning.com.au	1.2	1	☐	☒
		-		☐	☐

Limitations: *The protection measures that will be implemented based on information presented in this Bushfire Management Plan are minimum requirements and they do not guarantee that buildings or infrastructure will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating.*

This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the required protection measures (including bushfire resistant construction) and any other required or recommended measures, will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences whether or not due to the negligence of their consultants, their servants or agents, arising out of the services provided by their consultants.

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LIST OF FIGURES

SUMMARY STATEMENTS

THIS DOCUMENT – STATEMENT OF PURPOSE

The Bushfire Management Plan (BMP)

The BMP sets out the required package of bushfire protection measures to lessen the risks associated with a bushfire event. It establishes the responsibilities to implement and maintain these measures.

The BMP also identifies the potential for any negative impact on any environmental, biodiversity and conservation values that may result from the application of bushfire protection measures or that may limit their implementation.

Risks Associated with Bushfire Events

The relevant risks are the potential for loss of life, injury, or destroyed or damaged assets which results in personal loss and economic loss. For a given site, the level of that risk to persons and assets (the exposed elements) is a function of the potential threat levels generated by the bushfire hazard, and the level of exposure and vulnerability of the at risk elements to the threats.

Bushfire Protection Measures

The required package of protection measures is established by *State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7)*, its associated *Guidelines* and any other relevant guidelines or position statements published by the Department of Planning, Lands and Heritage. These measures are limited to those considered by the WA planning authorities as necessary to be addressed for the purpose of land use planning. They do not encompass all available bushfire protection measures as many are not directly relevant to the planning approval stage. For example:

- Protection measures to reduce the vulnerability of buildings to bushfire threats is primarily dealt with at the building application stage. They are implemented through the process of applying the Building Code of Australia (Volumes 1 and 2 of the national Construction Code) in accordance with WA building legislation and the application of construction requirements based on a building's level of exposure - determined as a Bushfire Attack Level (BAL) rating); or
- Protection measures to reduce the threat levels of consequential fire (ignited by bushfire and involving combustible materials surrounding and within buildings) and measures to reduce the exposure and vulnerability of elements at risk exposed to consequential fire, are not specifically considered.

The package of required bushfire protection measures established by the Guidelines includes:

- The requirements of the bushfire protection criteria which consist of:
  - Element 1: Location (addresses threat levels).
  - Element 2: Siting and Design of Development (addresses exposure levels of buildings).
  - Element 3: Vehicular Access (addresses exposure and vulnerability levels of persons).
  - Element 4: Water (addresses vulnerability levels of buildings).
  - Element 5: Vulnerable Tourism Land Uses (addresses exposure and vulnerability as per Elements 1-4 but in use specific ways and with additional considerations of persons exposure and vulnerability).
- The requirement to develop Bushfire Emergency Plans / Information for 'vulnerable' land uses for persons to prepare, respond and recover from a bushfire event (this addresses vulnerability levels).
- The requirement to assess bushfire risk and incorporate relevant protection measures into the site emergency plans for 'high risk' land uses (this addresses threat, exposure and vulnerability levels).

Compliance of the Proposed Development or Use with SPP 3.7 Requirements

The BMP assesses the capacity of the proposed development or use to implement and maintain the required 'acceptable' solutions and any additionally recommended bushfire protection measures - or its capacity to satisfy the policy intent through the justified application of additional bushfire protection measures as supportable 'alternative' solutions.

THE PROPOSED DEVELOPMENT/USE – BUSHFIRE PLANNING COMPLIANCE SUMMARY		
Environmental Considerations		**Assessment Outcome**
Will land with identified environmental, biodiversity and conservation values limit the full application of the required bushfire protection measures?		Possible (check)
Will land with identified environmental, biodiversity and conservation values need to be managed in the implementation and maintenance of the bushfire protection measures - but not limit their application?		Possible (check)
Required Bushfire Protection Measures The Acceptable Solutions of the Bushfire Protection Criteria (Guidelines)		**Assessment Outcome**
Element	The Acceptable Solutions	
1: Location	A1 Location	Fully Compliant
	A1.1 Development location	Fully Compliant
2: Siting and Design of Development	A2 Siting and Design of Development	Fully Compliant
	A2.1 Asset Protection Zone (APZ)	Fully Compliant
3: Vehicular Access	A3 Vehicular Access	Fully Compliant
	A3.1 Public roads	Fully Compliant
	A3.2a Multiple access routes	Fully Compliant
	A3.2b Emergency access way	N/A
	A3.3 Through-roads	N/A
	A3.4a Perimeter roads	N/A
	A3.4b Fire service access route	N/A
	A3.5 Battle-axe legs	N/A
	A3.6 Private driveways	Fully Compliant
4: Water	A4 Water	Fully Compliant
	A4.1 Identification of future water supply	N/A
	A4.2 Provision of water for firefighting purposes	Fully Compliant
Other Documents Establishing Bushfire Protection Measure Variations or Additions		**Assessment Outcome**
A 'Planning Approval' or a 'Notice of Determination' which contains 'Conditions' to be met.		N/A
A DPLH/WAPC 'Position Statement'		N/A
Bushfire Management Plan Guidance for the Dampier Peninsula (DPLH 2021 Rev B)		N/A
Other 'Bushfire Planning' Documents to Be Produced This necessity for additional documents is determined by the proposed development/use type and the requirements established by SPP 3.7 and the associated Guidelines (as amended). They may be produced concurrently or subsequent to the BMP. Relevant actions will be identified within Section 6 'Responsibilities for Implementation of Bushfire Protection Measures.		**Required**

Bushfire Risk Assessment and Management Report:	Yes

Summary Statement: General Comment - The proposed development is considered a 'high-risk' land use as defined by SPP 3.7 and its associated Guidelines.

This triggers the requirement, through the development of a Risk Assessment and Management Report to:

- Identify the level of exposure and vulnerability of any onsite stored materials and liquids to bushfire attack mechanisms (threats);
- Identify any potential source of ignition threat the use may present to adjoining and/or adjacent bushfire prone vegetation; and
- Recommend protection measures that can be incorporated into the site operations emergency plan as necessary.

The requirement for this report to be developed and any variation to content, can be decided by the planning approval decision maker (e.g., the local government). Otherwise, SPP 3.7 states it 'should' be produced.

Refer to Addendum contained within this Bushfire Management Plan – A Risk Management Plan has not been prepared by Bushfire Prone Planning. Any treatments recommended and referenced in this plan to reduce the bushfire risk to this development site and its occupants in a bushfire event have been determined by Bioscience. The Decision Maker is to be satisfied with the treatments recommended and referenced in this plan.

1 PROPOSAL DETAILS AND THE BUSHFIRE MANAGEMENT PLAN

1.1 The Proposed Development/Use Details, Plans and Maps

The Proposal's Planning Stage For which certain bushfire planning documents are required to accompany the planning application.		Development Application
The Subject Land/Site		Wannamal Road Organics - Lot 7779 Wannamal Road, Cullalla – Shire of Gingin
Total Area of Subject Lot/Site		1660.7581 hectares
Number of Additional Lots Created		N/A
Primary Proposed Construction	**Type(s)**	N/A
	NCC Classification	N/A
The 'Specific' Land Use Type for **Bushfire Planning** When applicable, this classification establishes a requirement to conduct assessments and develop documents that are additional to this Bushfire Management Plan.		High Risk Land Use
Factors Determining the 'Specific Bushfire Planning' Land Use Type		Business operations/activities may include those that are a potential source of ignition for onsite or offsite combustible/flammable materials, including bushfire prone vegetation.
Description of the Proposed Development/Use		
This Bushfire Management Plan has been prepared to accompany a Development Application for the establishment and subsequent operation of a composting facility located at Lot 7779 Wannamal Road, Cullalla, in the Shire of Gingin.		
Description of Planned Staged Development and the Management of Potential Bushfire Planning Issues		
General Note - Refer to Figure 1.1 – While structures, inclusive of a Site Office and associated Ablutions are mobile, Bushfire Prone Planning recommends they be sited in the developable portion of the subject land and be surrounded by a Planning BAL-29 APZ so as to ensure the potential radiant heat impact of a bushfire does not exceed 29kWm^2.		

Refer Enlargement

1

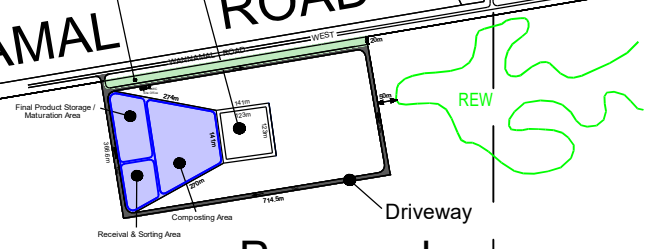
20

WEST

WANNAMAL ROAD

Landscaped Earth Bund

Dam



Proposed Development Footprint

7775

7779
1660.7581ha

2087

5499

5294

R41805
9727

98

0 200 400 600 800m

SCALE 1:20 000
ORIGINAL PLAN SIZE: A3

NORTH

STATEWEST PLANNING

Statewest Planning
Midland House
69 Great Northern Highway, Midland
PO Box 1377, Midland WA 6936
t. 9274 1363 m. 0418 932 792
e. simon.ohara@statewestplanning.com.au

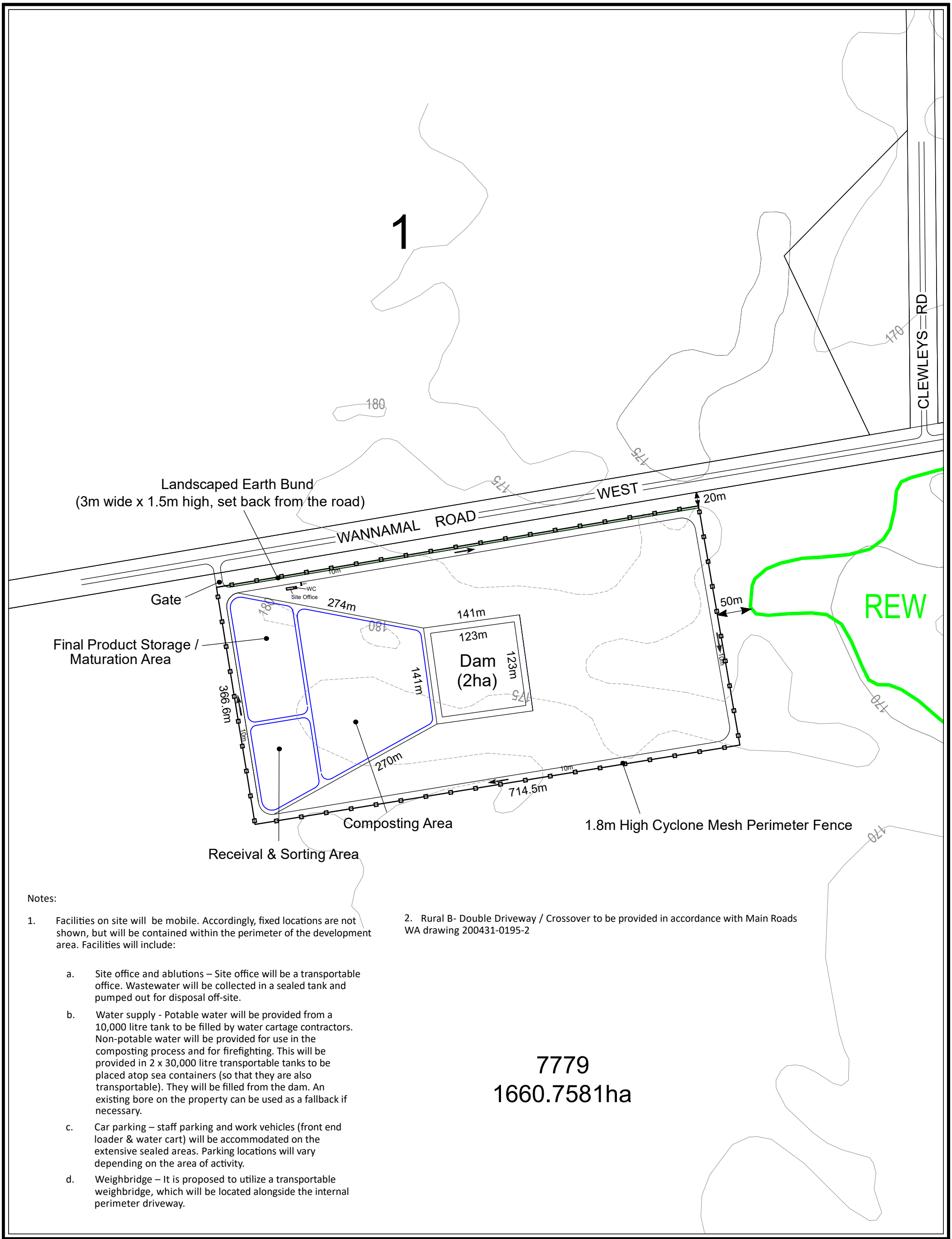
LEGEND:

Subject Land.....

DATE: 18.01.2024

SITE PLAN

LOT 7779 WANNAMAL ROAD WEST
CULLALA
Shire of Gingin



Notes:

1. Facilities on site will be mobile. Accordingly, fixed locations are not shown, but will be contained within the perimeter of the development area. Facilities will include:

   a. Site office and ablutions – Site office will be a transportable office. Wastewater will be collected in a sealed tank and pumped out for disposal off-site.

   b. Water supply - Potable water will be provided from a 10,000 litre tank to be filled by water cartage contractors. Non-potable water will be provided for use in the composting process and for firefighting. This will be provided in 2 x 30,000 litre transportable tanks to be placed atop sea containers (so that they are also transportable). They will be filled from the dam. An existing bore on the property can be used as a fallback if necessary.

   c. Car parking – staff parking and work vehicles (front end loader & water cart) will be accommodated on the extensive sealed areas. Parking locations will vary depending on the area of activity.

   d. Weighbridge – It is proposed to utilize a transportable weighbridge, which will be located alongside the internal perimeter driveway.

2. Rural B- Double Driveway / Crossover to be provided in accordance with Main Roads WA drawing 200431-0195-2

7779
1660.7581ha

0 50 100 150 200m
SCALE 1:5000
ORIGINAL PLAN SIZE: A3

NORTH

Statewest Planning
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69 Great Northern Highway, Midland
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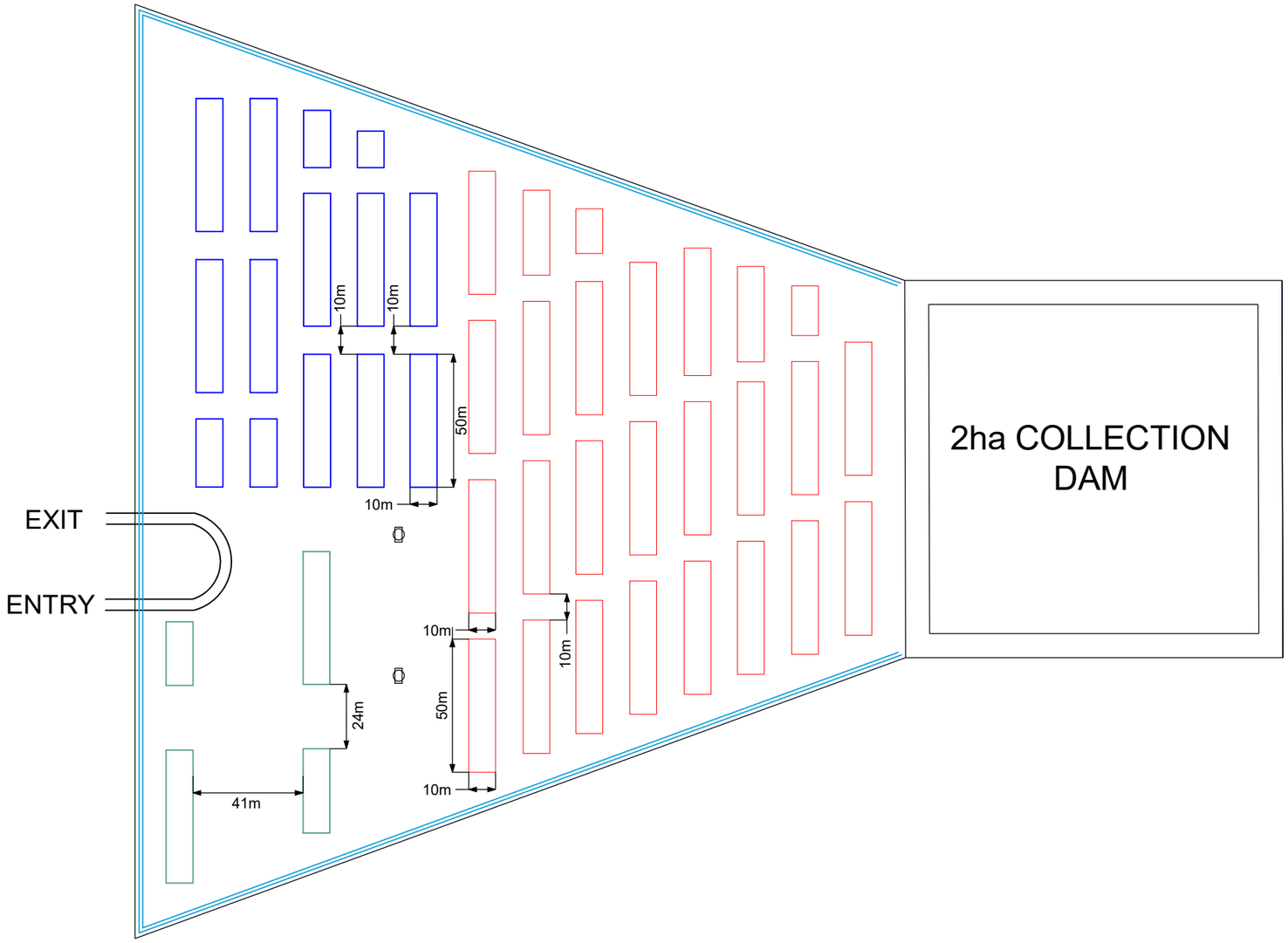
t. 9274 1363 m. 0418 932 792
e. simon.ohara@statewestplanning.com.au

DATE: 31.01.2024

SITE PLAN

LOT 7779 WANNAMAL ROAD WEST
CULLALA
Shire of Gingin



0 20 40 60 80m

SCALE 1:2000
ORIGINAL PLAN SIZE: A3

NORTH

STATEWEST PLANNING

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e. simon.ohara@statewestplanning.com.au

STOCKPILE LAYOUT WITHIN RECEIVAL AND SORTING AREA
STOCKPILE LAYOUT WITHIN COMPOSTING AREA
FINAL PRODUCT LAYOUT WITHIN STORAGE AREA
200mm BUND MADE OF ASPHALT
30,000 L TANK PLACED ON TOP OF 20' SEA CONTAINER

DATE: 24.01.2024

PROPOSED STOCKPILE LAYOUT

LOT 7779 WANNAMAL ROAD WEST
CULLALA
Shire of Gingin

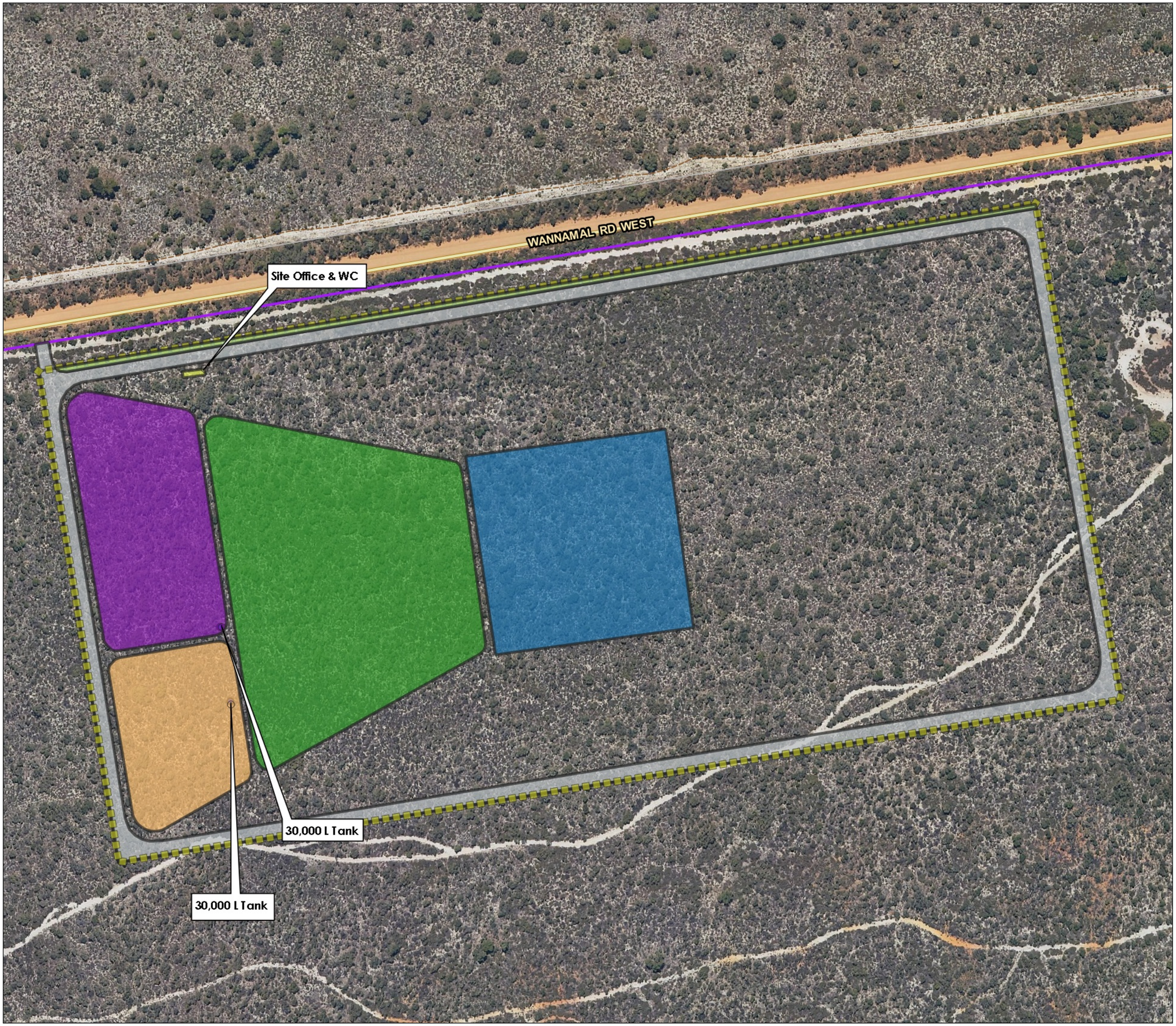


Figure 1.4

Proposed Development Map

Lot 7779 on Plan / Diagram: P209806, Area 1660.7581ha
Wannamal Road West
Cullalla
Shire of Gingin

------ LEGEND ------

- Cadastral
- Subject Site

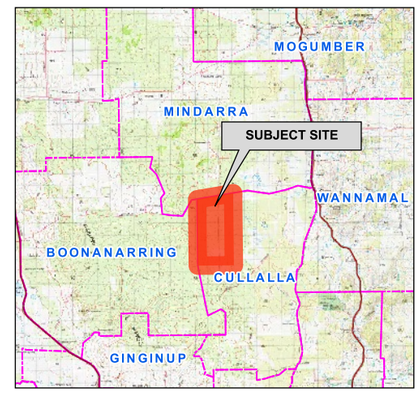
Proposal

- Site Office & WC
- 2ha Collection Dam
- 30,000 L Water Tank
- Composting Area
- Receival & Sorting Area
- Final Product Storage/Maturation Area
- Internal Access Road
- 1.8m Perimeter Fence
- Landscaped Earth Bund

0 25 50 75 100 125

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: 12-03-2024
SCALE (A3): 1 : 2500

BUSHFIRE PRONE PLANNING

211042_Proposal_Stockpile_Lot 7779 Wannamal Road Cullalla (BMP RMP).qgz

Figure 1.5

Location Map

Lot 7779 on Plan / Diagram: P209806,
Area: 1660.7581ha
Wannamal Road West
Cullalla
Shire of Gingin

------ LEGEND ------

- Subject Site
- Local Government Authority
- Localities/Suburb

DFES Stations (DFES-023)

- Bush Fire Brigade
- Reserves

DBCA Legislated Lands & Waters (DBCA-011)

- National Park
- Nature Reserve
- State Forest

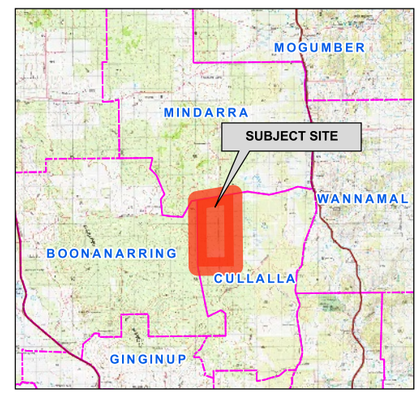
DBCA Lands of Interest (DBCA-012)

- Crown Freehold
- Crown Reserve
- Unallocated Crown Land

0 2,500 5,000 7,500 10,000 12,500

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: 01-03-2024
SCALE (A3): 1 : 200000

BUSHFIRE PRONE PLANNING

WHERE SPP 3.7 AND THE GUIDELINES ARE TO APPLY – DESIGNATED BUSHFIRE PRONE AREAS

All higher order strategic planning documents, strategic planning proposals, subdivisions and development applications located in designated bushfire prone areas need to address SPP 3.7 and its supporting Guidelines. This also applies where an area is not yet designated as bushfire prone but is proposed to be developed in a way that introduces a bushfire hazard.

For development applications where only part of a lot is designated as bushfire prone and the proposed development footprint is wholly outside of the designated area, the development application will not need to address SPP 3.7 or the Guidelines. (Guidelines DPLH 2021 v1.4, s1.2).

For subdivision applications, if all the proposed lots have a BAL-LOW indicated, a BMP is not required. (Guidelines DPLH 2021 v1.4, s5.3.1).

Figure 1.6

Bushfire Prone Area

Lot 7779 on Plan / Diagram: P209806,
Area: 1660.7581ha
Wannamal Road West
Cullalla
Shire of Gingin

MINDARRA

WANNAMAL RD WEST

Site Office & WC

SHIRE OF GINGIN

CULLALLA

30,000 L Tank

30,000L Tank

------ LEGEND ------

- Bushfire Prone Areas 2021
- Local Government Authority
- Localities/Suburb
- Cadastral
- Subject Site

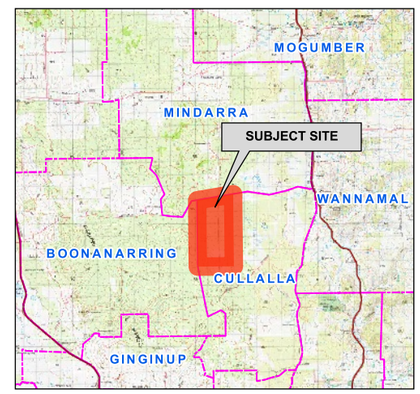
Proposal

- Site Office & WC
- 2ha Collection Dam
- 30,000 L Water Tank
- Composting Area
- Receival & Sorting Area
- Final Product Storage/Maturation Area
- Internal Access Road
- 1.8m Perimeter Fence
- Landscaped Earth Bund

0 25 50 75 100 125

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: 12-03-2024
SCALE (A3): 1 : 2500

BUSHFIRE PRONE PLANNING

1.2 The Bushfire Management Plan (BMP)

1.2.1 Commissioning and Purpose

Landowner / proponent:	Wannamal Road Organics – Peter Keating
Bushfire Prone Planning commissioned to produce the BMP by:	Statewest Planning – Simon O'hara
Purpose of the BMP:	To assess the proposal's ability to meet all relevant requirements established by State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7), the associated 'Guidelines and any relevant Position Statements; and To satisfy the requirement for the provision of a Bushfire Management Plan to accompany the development application.
BMP to be submitted to:	Shire of Gingin

1.2.1 Other Documents with Implications for Development of this BMP

This section identifies any known assessments, reports or plans that have been conducted and prepared previously, or are being prepared concurrently, and are relevant to the planned proposal for the subject. They potentially have implications for the assessment of bushfire threats and the identification and implementation of the protection measures that are established by this Bushfire Management Plan.

Table 1.4: Other relevant documents that may influence threat assessments and development of protection measures.

RELEVANT DOCUMENTS					
Document	Relevant	Currently Exists	To Be Developed	Copy Provided by Proponent / Developer	Title
Structure Plan	No	N/A	N/A	N/A	-
Bushfire Management Plan	Yes	Yes	N/A	N/A	Bushfire Management Plan (Prepared by Bushfire Prone Planning – 7 February 2022) - 211042 - Lot 7779 Wannamal Road, Cullalla (BMP) v1.0
Implications for this BMP: Revised Bushfire Management Plan required to account for changes in Standards, State Planning Policies and associated Guidelines in conjunction with changes to the overall proposal.					
Bushfire Emergency Plan or Information	No	N/A	N/A	N/A	-
Bushfire Risk Assessment and Management Report	Yes	Yes	N/A	Yes	Fire Management Plan: Lot 7779 on Deposited Plan 209806 Wannamal Road Cullalla (Prepared by Bioscience – May 2020)
Implications for the BMP: General Comment - The proposed development is considered a 'high-risk' land use as defined by SPP 3.7 and its associated Guidelines. Refer to Addendum contained within this Bushfire Management Plan – A Risk Management Plan has not been prepared by Bushfire Prone Planning. Any treatments recommended and referenced in this plan to reduce the bushfire risk to this development site and its occupants in a bushfire event have been determined by Bioscience. The Decision Maker is to be satisfied with the treatments recommended and referenced in this plan.					
Environmental Asset or Vegetation Survey	Yes	N/A	N/A	No	-
Landscaping and Revegetation Plan	No	N/A	N/A	N/A	-
Land Management Agreement	No	N/A	N/A	N/A	-

2 BUSHFIRE PRONE VEGETATION – ENVIRONMENTAL & ASSESSMENT CONSIDERATIONS

2.1 Environmental Considerations – 'Desktop' Assessment

This 'desktop' assessment must not be considered as a replacement for a full Environmental Impact Assessment. It is a summary of potential environmental values at the subject site, inferred from information contained in listed datasets and/or reports, which are only current to the date of last modification.

These data sources must be considered indicative where the subject site has not previously received a site-specific environmental assessment by an appropriate professional.

Many bushfire prone areas also have high biodiversity values. Consideration of environmental priorities within the boundaries of the land being developed can avoid excessive or unnecessary modification or clearing of vegetation. Approval processes (and exemptions) apply at both Commonwealth and State levels.

Any 'modification' or 'clearing' of vegetation to reduce bushfire risk is considered 'clearing' under the ***Environmental Protection Act 1986*** (EP Act) and requires a clearing permit under the ***Environmental Protection (Clearing of Native Vegetation) Regulations 2004*** (Clearing Regulations) – unless for an exempt purpose.

Clearing native vegetation is an offence, unless done under a clearing permit or the clearing is for an exempt purpose. Exemptions are contained in the EP Act or are prescribed in the Clearing Regulations (note: these do not apply in environmentally sensitive areas).

The ***Department of Water and Environmental Regulation*** (DWER) is responsible for issuing 'clearing' permits and the framework for the regulation of clearing. Approvals under other legislation, from other agencies, may also be required, dependent on the type of flora or fauna present.

Local Planning Policy or Local Biodiversity Strategy: Natural areas that are not protected by the above Act and Regulation (or any other National or State Acts) may be protected by a local planning policy or local biodiversity strategy. Permission from the local government will be required for any modification or removal of native vegetation in these Local Natural Areas (LNA's). Refer to the relevant local government for detail.

For further Information refer to Guidelines v1.4, the Bushfire and Vegetation Factsheet - WAPC, Dec 2021 and https://www.der.wa.gov.au/our-work/clearing-permits

Figure 2.1

Environmental Considerations Map

Lot 7779 on Plan / Diagram: P209806,
Area: 1660.7581ha
Wannamal Road West
Cullalla
Shire of Gingin

------ LEGEND ------

- Subject Site
- Bush Forever Sites
- Clearing Regulations
- Reserves

Environmentally Sensitive Areas

- Declared Rare Fauna
- Threatened Ecological Community
- Declared Rare Flora

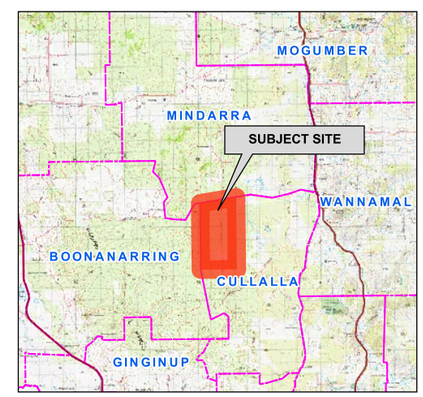
Geomorphic Wetlands Swan Coastal Plain

- Dampland
- Floodplain
- Lake
- Not Assessed
- Palusplain
- Sumpland

0 2,500 5,000 7,500 10,000 12,500

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: 01-03-2024
SCALE (A3): 1 : 200000

BUSHFIRE PRONE PLANNING

2.1.1 Declared Environmentally Sensitive Areas (ESA)

IDENTIFICATION OF RELEVANT ENVIRONMENTALLY SENSITIVE AREAS							
ESA Class	Relevant to Proposal	Influence on Bushfire Threat Levels and / or Application of Bushfire Protection Measures	Relevant Dataset	Information Source(s) Applied to Identification of Relevant Vegetation			Further Action Required
				Dataset	Landowner or Developer	Environmental Asset or Vegetation Survey	
Wetlands and their 50m Buffer (Ramsar, conservation category and nationally important)	Yes	Yes - Moderate	DBCA-010 and 011, 019, 040, 043, 044	☒	☐	☐	Confirm with relevant agency
Bush Forever	No	N/A	DPLH-022, SPP 2.8	☒	☐	☐	None
Threatened and Priority Flora + 50m Continuous Buffer	Possible	Possible	DBCA-036	Restricted Scale of Data Available (security)	☐	☐	Confirm with relevant agency
Threatened Ecological Community	Possible	Possible	DBCA-038		☐	☐	Confirm with relevant agency

DESCRIPTION OF THE IDENTIFIED ENVIRONMENTALLY SENSITIVE AREAS:

Refer Figure 2.1 Environmental Considerations map for identified environmentally sensitive areas. The relevant State agencies should be further consulted, and details confirmed as part of due diligence for the proposal.

2.1.2 Other Protected Vegetation on Public Land

IDENTIFICATION OF PROTECTED VEGETATION ON PUBLIC LAND							
Land with Environmental, Biodiversity, Conservation and Social Values	Relevant to Proposal	Influence on Bushfire Threat Levels and / or Application of Bushfire Protection Measures	Relevant Dataset	Information Source(s) Applied to Identification of Relevant Vegetation			Further Action Required
				Dataset	Landowner or Developer	Environmental Asset or Vegetation Survey	
Legislated Lands (tenure includes national park/reserve, conservation park, crown reserve and state forest)	No	N/A	DBCA-011	☒	☐	☐	None
Conservation Covenants	Unknown	Unknown	DPIRD-023	Only Available to Govt.	☐	☐	Confirm with relevant agency

2.1.3 Response of Proposed Development to Identified Environmental Limitations

Consideration of the implications that identified protected areas of vegetation (i.e., those with environmental and subject to conservation) have for the proposed development.

PROPOSED DEVELOPMENT RESPONSE TO IDENTIFIED 'PROTECTED' VEGETATION	
The existence of 'protected' areas of vegetation has implications for the ability of the proposed development to reduce potential bushfire impact through modification or removal of vegetation.	No
Application of Design and/or Construction Responses to Limit Vegetation Modification or Removal	
Modify the development location to reduce exposure by increasing separation distance.	N/A
Redesign development, structure plan or subdivision.	N/A
Reduction of lot yield where this can increase available separation distances.	N/A
Cluster development to limit modification or removal of vegetation.	N/A
Construct building(s) to the requirements corresponding to higher BAL ratings to reduce required separation distances.	N/A

2.2 Bushfire Assessment Considerations

2.2.1 Planned Onsite Vegetation Landscaping

Identification of areas of the subject site planned to be landscaped, creating the potential for increased or decreased bushfire hazard for proposed development.

PLANNED LANDSCAPING	
Relevant to Proposal:	Unlikely

2.2.2 Planned / Potential Offsite Rehabilitation or Re-Vegetation

Identification of areas of land adjacent to the subject site on which re-vegetation (as distinct from natural re-generation) will or may occur and is likely to present a greater bushfire hazard for proposed development.

POTENTIAL RE-VEGETATION PROGRAMS		
Land with Environmental, Biodiversity, Conservation and Social Values	Relevant to Proposal	Description
Riparian Zones / Foreshore Areas	No	
Wetland Buffers	No	
Legislated Lands	No	
Public Open Space	No	
Road Verges	No	
Other	No	

2.2.3 Identified Requirement to Manage, Modify or Remove Onsite or Offsite Vegetation

Identification of native vegetation subject to management, modification or removal.

REQUIREMENT TO MANAGE, MODIFY OR REMOVE NATIVE VEGETATION	
Has a requirement been identified to manage, modify or remove **onsite** native vegetation to establish the required bushfire protection measures on the subject site?	Yes
Refer to Figure 3.1b 'Classified Vegetation & Topography Map (Post Development) – Variations Applied' and Refer to Appendix A1.2 for justification details supporting the change.	
Is approval, from relevant state government agencies and/or the local government, to modify or remove **onsite** native vegetation required? (Note: if 'Yes' evidence of its existence should be provided in this BMP).	Yes
Refer to Figure 3.1b 'Classified Vegetation & Topography Map (Post Development) – Variations Applied' and Refer to Appendix A1.2 for justification details supporting the change.	
Has a requirement been identified to manage, modify or remove **offsite** native vegetation to establish the required bushfire protection measures on the subject site?	No
Is written approval required, from relevant state government agencies and/or the local government, that permits the landowner, or another identified party, to modify or remove **offsite**	No

bushfire prone vegetation and/or conduct other works, to establish an identified bushfire protection measure(s)? If 'Yes', appropriate evidence of the approval or how it is to be established, shall be provided in this BMP as an addendum.	
Is a written management agreement required that states the obligation of the landowner, or another responsible party, to manage defined areas of **offsite** bushfire prone vegetation, in perpetuity, to ensure the conditions of no fire fuels and/or low threat vegetation and/or vegetation managed in a minimal fuel condition, continue to be met? If 'Yes', appropriate evidence of the agreement or how it is to be established, shall be provided in this BMP as an addendum.	No

2.2.4 Variations to Assessed Areas of Classified Vegetation to be Applied

FOR THE PROPOSED DEVELOPMENT SITUATIONS TO BE ACCOUNTED FOR IN ASSESSING THE POTENTIAL BUSHFIRE IMPACT (BAL)	
Area(s) of land will be subject to future vegetation rehabilitation or re-vegetation that will require a change to a higher threat classification of vegetation on that land to. (Note: this is not regeneration to the mature natural state which is accounted for in the 'existing state' assessment in accordance with AS 3959:2018).	No
Modification of existing area(s) of classified vegetation due to the implementation of the proposed development and/or prior to the site's occupancy or use. This modification will require a change to a lower threat classification (or exclusion from classification) for that area of vegetation.	Yes
Refer to Figure 3.1b 'Classified Vegetation & Topography Map (Post Development) – Variations Applied' and Refer to Appendix A1.2 for justification details supporting the change.	
Complete removal of existing area(s) of classified vegetation due to the implementation of the proposed development and/or prior to the site's occupancy or use. This modification will require an exclusion from classification for that area of vegetation.	Yes
Refer to Figure 3.1b 'Classified Vegetation & Topography Map (Post Development) – Variations Applied' and Refer to Appendix A1.2 for justification details supporting the change.	

3 BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT

BUSHFIRE ATTACK LEVELS (BAL) - UNDERSTANDING THE RESULTS

The potential transfer (flux/flow) of radiant heat from the bushfire to a receiving object is measured in kW/m^2. The AS 3959:2018 BAL determination methodology establishes the ranges of radiant heat flux that correspond to each bushfire attack level. These are identified as BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

The bushfire performance requirements for certain classes of buildings are established by the Building Code of Australia (Vol. 1 & 2 of the NCC). The BAL will establish the bushfire resistant construction requirements that are to apply in accordance with AS 3959:2018 - *Construction of buildings in bushfire prone areas* and the NASH Standard – *Steel framed construction in bushfire areas (NS 300 2021),* whose solutions are deemed to satisfy the NCC bushfire performance requirements.

DETERMINED BAL RATINGS

A BAL Certificate can be issued for a determined BAL. A BAL can only be classed as 'determined' for an existing or future building/structure when:

1. It's final design and position on the lot are known and the stated separation distance from classified bushfire prone vegetation exists and can justifiably be expected to remain in perpetuity; or

2. It will always remain subject to the same BAL regardless of its design or position on the lot after accounting for any regulatory or enforceable building setbacks from lot boundaries as relevant and necessary (e.g., R-codes, restrictive covenants, defined building envelopes) or the retention of any existing classified vegetation either onsite or offsite.

If the BMP derives determined BAL(s), the BAL Certificate(s) required for submission with building applications can be provided, using the BMP as the assessment evidence.

INDICATIVE BAL RATINGS

A BAL Certificate cannot be issued for an indicative BAL. A BAL will be classed as 'indicative' for an existing or future building/structure when the required conditions to derive a determined BAL are not met.

This class of BAL rating indicates what BAL(s) could be achieved and the conditions that need to be met are stated.

Converting the indicative BAL into a determined BAL is conditional upon the currently unconfirmed variable(s) being confirmed by a subsequent assessment and evidential documentation. These variables will include the future building(s) location(s) being established (or changed) and/or classified vegetation being modified or removed to establish the necessary vegetation separation distance. This may also be dependent on receiving approval from the relevant authority for that modification/removal.

BAL RATING APPLICATION – PLANNING APPROVAL VERSUS BUILDING APPROVAL

1. **Planning Approval**: SPP.3.7 establishes that where BAL- LOW to BAL-29 will apply to relevant future construction (or existing structures for proposed uses), the proposed development may be considered for approval (dependent on the other requirements of the relevant policy measures being met). That is, BAL40 or BAL-FZ are not acceptable on planning grounds (except for certain limited exceptions).

   Because planning is looking forward at what can be achieved, as well as looking at what may currently exist, both determined and indicative BAL ratings are acceptable assessment outcomes on which planning decisions can be made (including conditional approvals).

2. **Building Approval:** The Building Code of Australia (Vol. 1 & 2 of the NCC) establishes that relevant buildings in bushfire prone areas must be constructed to the bushfire resistant requirements corresponding to the BAL rating that is to apply to that building. Consequently, a determined BAL rating and the BAL Certificate is required for a building permit to be issued - an indicative BAL rating is not acceptable.

3.1 BAL Assessment Summary (Contour Map Format)

INTERPRETATION OF THE BAL CONTOUR MAP

The BAL contour map is a diagrammatic representation of the results of the bushfire attack level assessment.

The map presents different coloured contours extending out from the areas of classified vegetation. Each contour represents a set range of radiant heat flux that potentially will transfer to an exposed element (building, person or other defined element), when it is located within that contour.

Each of the set ranges of radiant heat flux corresponds to a different BAL rating as defined by the AS 3959:2018 BAL determination methodology.

The width of each shaded BAL contour will vary dependant on both the BAL rating and the relevant parameters (calculation inputs) for the subject site. Their width represents the minimum and maximum vegetation separation distances that correspond to each BAL rating (refer to the relevant table below for these distances).

The areas of classified vegetation to be considered in developing the BAL contours, are those that will remain at the intended end state of the subject development once earthworks, clearing and/or landscaping and re-vegetation have been completed. Variations to this statement that may apply include:

- Both pre and post development BAL contour maps are produced; and/or
- Each stage of a development is assessed independently.

3.1.1 BAL Determination Methodology and Location of Data and Results

LOCATION OF DATA & RESULTS					
BAL Determination Methodology		Location of the Site Assessment Data			Location of the Results
AS 3959:2018	Applied to Assessment	Classified Vegetation and Topography Map(s)	Calculation Input Variables		Assessed Bushfire Attack Levels and/or Radiant Heat Levels
			Summary Data	Detailed Data with Explanatory and Supporting Information	
Method 1 (Simplified)	Yes	Figure 3.1a & 3.1b	Table 3.2	Appendix A1	Table 3.1 Table 3.3 / BAL Contour Map
Method 2 (Detailed)	No	N/A	N/A	N/A	

3.1.2 BAL Ratings Derived from the Contour Map

Table 3.1: Indicative and determined BAL(s) for existing and/or proposed building works.

BUSHFIRE ATTACK LEVEL FOR EXISTING/PLANNED BUILDINGS/STRUCTURE [1]		
Building/Structure Description	Indicative BAL [2]	Determined BAL [2]
Site Office & WC	BAL-29	Not Determined
2ha Collection Dam Area	BAL-29	Not Determined
Receival & Sorting Area	BAL-29	Not Determined
Composting Area	BAL-29	Not Determined
Final Product Storage/Maturation Area	BAL-29	Not Determined

[1] The assessment data used to derive the BAL ratings is sourced from Table 3.1 and Figure 3.2 'BAL Contour Map'.

[2] Refer to the start of Section 3 for an explanation of indicative versus determined BAL ratings.

3.1.3 Site Assessment Data Applied to Construction of the BAL Contour Map(s)

RELEVANT CLASSIFIED VEGETATION	
Identification of Classified Vegetation that is Relevant to the Production of the BAL Contour Map(s)	Relevant Vegetation Map
The relevant vegetation will be all areas of classified vegetation that exist at the time of the site assessment – both within the subject site (onsite) and external to the subject site (offsite).	Figure 3.1a
The relevant vegetation for the post-development BAL contour map will be any area of classified vegetation - both within the subject site (onsite) and external to the subject site (offsite) - that will remain at the intended end state of the subject development once earthworks, any clearing and/or landscaping and re-vegetation have been completed.	Figure 3.2
As depicted in Figures 3.1b and 3.2 - All identified classified vegetation areas, or portions of areas – (i.e. implemented Asset Protection Zones), within the subject lot are excluded. This approach is applied to indicate the achievable bushfire attack levels within the specified lot and the resultant area of developable land where buildings will be subject to BAL-29 or less. It is based on the following assumptions: 1. Any classified vegetation within a lot can potentially be managed or removed by the landowner to meet asset protection zone standards; and 2. Future development and consequent removal/management of vegetation that may take place on any adjoining lot cannot be part of considerations for the subject lot.	Figures 3.1b & 3.2
Supporting Assessment Details: None Required.	

Table 3.2: The calculation inputs applied to determining the site specific separation distances corresponding to levels of potential radiant heat transfer (including BAL's).

SUMMARY OF CALCULATION INPUT VARIABLES APPLIED TO THE DETERMINATION OF SEPARATION DISTANCES CORRESPONDING TO RADIANT HEAT LEVELS [1]												
Applied BAL Determination Method		METHOD 1 - SIMPLIFIED PROCEDURE (AS 3959:2018 CLAUSE 2.2)										
The Calculation Variables Corresponding to the BAL Determination Method Applied												
Methods 1 and 2		Method 1	Method 2									
Vegetation Classification		FDI	Effective Slope		Site Slope	FFDI or GFDI	Flame Temp.	Elevation of Receiver	Flame Width	Fireline Intensity	Flame Length	Modified View Factor
			Applied Range	Determined								
Area	Class		degree range	degrees	degrees		K	metres	metres	kW/m	metres	% Reduction
1	(D) Scrub	80	Upslope or flat 0	flat 0								
2	(D) Scrub	80	Downslope >0-5	d/slope 2								
3	(A) Forest	80	Upslope or flat 0	flat 0								
4	(A) Forest	80	Downslope >0-5	d/slope 2								
5	(B) Woodland	80	Upslope or flat 0	flat 0								
6	Excluded cl 2.2.3.2(e)	N/A	N/A	N/A								

[1] All data and information supporting the determination of the classifications and values stated in this table and any associated justification, is presented in Appendix A.

Where the values are stated as 'default' these are either the values stated in AS 3959:2018, Table B1 or the values calculated as intermediate or final outputs through application of the equations of the AS 3959:2018 BAL determination methodology. They are not values derived by the assessor.

Table 3.3: Vegetation separation distances corresponding to the radiant heat levels illustrated as BAL contours in Figure 3.2.

THE CALCULATED VEGETATION SEPARATION DISTANCES (METRES) CORRESPONDING TO THE STATED LEVEL OF RADIANT HEAT FLUX [1]									
Vegetation Classification		Bushfire Attack Levels						Specific Values	
		BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW		
		Maximum Radiant Heat Flux							
Area	Class	>40 kW/m^2	40 kW/m^2	29 kW/m^2	19 kW/m^2	12.5 kW/m^2	N/A [2]	10 kW/m^2	2 kW/m^2
1	(D) Scrub	<10	10-<13	13-<19	19-<27	27-<100	>100		
2	(D) Scrub	<11	11-<15	15-<22	22-<31	31-<100	>100		
3	(A) Forest	<16	16-<21	21-<31	31-<42	42-<100	>100		
4	(A) Forest	<20	20-<27	27-<37	37-<50	50-<100	>100		
5	(B) Woodland	<10	10-<14	14-<20	20-<29	29-<100	>100		
6	Excluded cl 2.2.3.2(e)	<6	6-<8	8-<12	12-<17	17-<50	>50		

[1] All calculation input variables are presented in Table 3.2. A copy of the radiant heat calculator output for each area of classified vegetation is presented in Appendix A3.

[2] The BAL-LOW rating is not defined by the level of radiant heat flux. It applies when the vegetation separation distance is 100m or 50m for the Grassland vegetation classification.

Figure 3.1a

Classified Vegetation & Topography (Existing)

Lot 7779 on Plan / Diagram: P209806,
Area: 1660.7581ha
Wannamal Road West
Cullalla
Shire of Gingin

CLEWLEYS RD

WANNAMAL RD WEST

AREA 5
Class (B) Woodland
Effective Slope 0°

AREA 6
Excluded

AREA 1
Class (D) Scrub
Effective Slope 0°

Site Office & WC

AREA 6
Excluded

AREA 2
Class (D) Scrub
Effective Slope >0-5°

AREA 1
Class (D) Scrub
Effective Slope 0°

AREA 4
Class (A) Forest
Effective Slope >0-5°

AREA 1
Class (D) Scrub
Effective Slope 0°

AREA 3
Class (A) Forest
Effective Slope 0°

30,000 L Tank

30,000 L Tank

180m
175m
170m

1 2 3 4 5 6 7 8 9 10 11 12

------ LEGEND ------

- Photo and Direction
- Elevation
- Subject Site

Proposal

- Site Office & WC
- 2ha Collection Dam
- 30,000 L Water Tank
- Composting Area
- Receival & Sorting Area
- Final Product Storage/Maturation Area
- Internal Access Road
- 1.8m Perimeter Fence
- Landscaped Earth Bund
- 150m Assessment Area

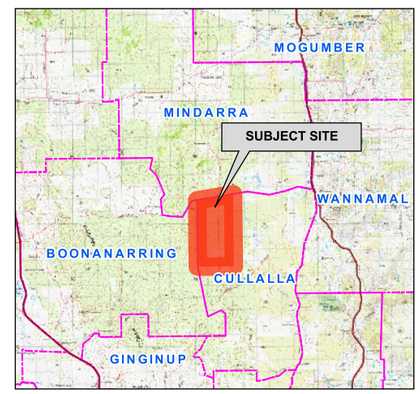
Classified Vegetation

- Class A - Forest
- Class B - Woodland
- Class D - Scrub
- Exclusion 2.2.3.2

0 50 100 150 200 250

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: 12-03-2024
SCALE (A3): 1 : 4000

BUSHFIRE PRONE PLANNING

211042_VegTop_Existing_Lot 7779 Wannamal Road Cullalla (BMP RMP).qgz

Figure 3.1b

Classified Vegetation & Topography (Post Development)

Lot 7779 on Plan / Diagram: P209806,
Area: 1660.7581ha
Wannamal Road West
Cullalla
Shire of Gingin

AREA 5
Class (B) Woodland
Effective Slope 0°

AREA 6
Excluded

AREA 1
Class (D) Scrub
Effective Slope 0°

Site Office & WC

AREA 2
Class (D) Scrub
Effective Slope >0-5°

AREA 1
Class (D) Scrub
Effective Slope 0°

AREA 4
Class (A) Forest
Effective Slope >0-5°

AREA 1
Class (D) Scrub
Effective Slope 0°

AREA 3
Class (A) Forest
Effective Slope 0°

30,000 L Tank

30,000 L Tank

WANNAMAL RD WEST

CLEWLEYS RD

180m

175m

170m

------ LEGEND ------

- Photo and Direction
- Elevation
- Subject Site

Proposal
- Site Office & WC
- 2ha Collection Dam
- 30,000 L Water Tank
- Composting Area
- Receival & Sorting Area
- Final Product Storage/Maturation Area
- Internal Access Road
- 1.8m Perimeter Fence
- Landscaped Earth Bund

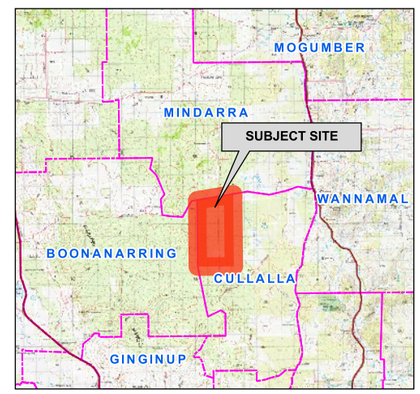
Asset Protection Zone
- APZ - BAL-29
- 150m Assessment Area

Classified Vegetation
- Class A - Forest
- Class B - Woodland
- Class D - Scrub
- Exclusion 2.2.3.2

0 50 100 150 200 250

Metres

------ LOCALITY ------



AERIAL IMAGERY: Landgate/SLIP

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: 12-03-2024
SCALE (A3): 1 : 4000

BUSHFIRE PRONE PLANNING

Figure 3.2

BAL Contour Map

Lot 7779 on Plan / Diagram: P209806,
Area: 1660.7581ha
Wannamal Road West
Cullalla
Shire of Gingin

CLEWLEYS RD

WANNAMAL RD WEST

AREA 5

AREA 6

AREA 6

AREA 1

Site Office & WC

AREA 2

AREA 1

AREA 4

AREA 1

AREA 3

30,000 L Tank

30,000 L Tank

------ LEGEND ------

- Subject Site

Proposal
- Site Office & WC
- 2ha Collection Dam
- 30,000 L Water Tank
- Composting Area
- Receival & Sorting Area
- Final Product Storage/Maturation Area
- Internal Access Road
- 1.8m Perimeter Fence
- Landscaped Earth Bund

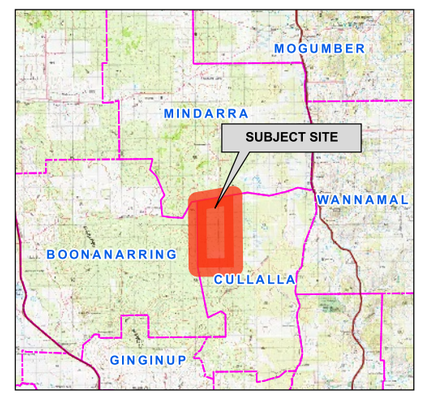
Asset Protection Zone
- APZ - BAL-29
- 150m Assessment Area
- 100m Assessment Area

Bushfire Attack Levels
- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

0 50 100 150 200 250

Metres

------ LOCALITY ------



N

AERIAL IMAGERY: Landgate/SLIP

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Merctaor Units: Metre
Map by: 12-03-2024
SCALE (A3): 1 : 4000

211042_BAL_PostDev_Lot 7779 Wannamal Road Cullalla (BMP RMP).qgz

4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

The Guidelines for Planning in Bushfire Prone Areas (WAPC 2021 v1.4), Appendix 5, establish that the application of this section of the BMP is intended to support ***strategic planning*** proposals. At the strategic planning stage there will typically be insufficient proposed development detail to enable all required assessments, including the assessment against the bushfire protection criteria.

Strategic Planning Proposals

For strategic planning proposals this section of the BMP will identify:

- Issues associated with the level of the threats presented by any identified bushfire hazard;
- Issues associated with the ability to implement sufficient and effective bushfire protection measures to reduce the exposure and vulnerability levels (of elements exposed to the hazard threats), to a tolerable or acceptable level; and
- Issues that will need to be considered at subsequent planning stages.

All Other Planning Proposals

For all other planning stages, this BMP will address what are effectively the same relevant issues but do it within the following sections:

- Section 2 – Bushfire Prone Vegetation - Environmental and Assessment Considerations: Assess environmental, biodiversity and conservation values;
- Section 3 – Potential Bushfire Impact: Assess the bushfire threats with the focus on flame contact and radiant heat; and
- Section 5 – Assessment Against the Bushfire Protection Criteria (including the guidance provided by the *Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2'):* Assess the ability of the proposed development to apply the required bushfire protection measures thereby enabling it to be considered for planning approval for these factors.

Is the proposed development a strategic planning proposal?	No

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA (GUIDELINES V1.4)

5.1 Bushfire Protection Criteria Elements Applicable to the Proposed Development/Use

APPLICATION OF THE CRITERIA, ACCEPTABLE SOLUTIONS AND PERFORMANCE ASSESSMENT

The criteria are divided into five elements – location, siting and design, vehicular access, water and vulnerable tourism land uses. Each element has an intent outlining the desired outcome for the element and reflects identified planning and policy requirements in respect of each issue.

The example acceptable solutions (bushfire protection measures) provide one way of meeting the element's intent. Compliance with these automatically achieves the element's intent and provides a straightforward pathway for assessment and approval.

Where the acceptable solutions cannot be met, the ability to develop design responses (as alternative solutions that meet bushfire performance requirements) is an alternative pathway that is provided by addressing the applicable performance principles (as general statements of how best to achieve the intent of the element).

A merit based assessment is established by the SPP 3.7 and the Guidelines as an additional alternative pathway along with the ability of using discretion in making approval decisions (sections 2.5, 2.6 and 2.7). This is formally applied to certain development (minor and unavoidable – sections 5.4.1 and 5.7). Relevant decisions by the State Administrative Tribunal have also supported this approach more generally.

Elements 1 – 4 should be applied for all strategic planning proposals, subdivision or development applications, except for vulnerable tourism land uses which should refer to Element 5. Element 5 incorporates the bushfire protection criteria in Elements 1 – 4 but caters them specifically to tourism land uses. (Guidelines DPLH 2021v1.4)

The Bushfire Protection Criteria	Applicable to the Proposed Development/Use
Element 1: Location	Yes
Element 2: Siting and Design	Yes
Element 3: Vehicular Access	Yes
Element 4: Water	Yes
Element 5: Vulnerable Tourism Land Uses	No

5.2 Local Government Variations to Apply

Local governments may add to or modify the acceptable solutions to recognise special local or regional circumstances (e.g., topography / vegetation / climate). These are to be endorsed by both the WAPC and DFES before they can be considered in planning assessments. (Guidelines DPLH 2021v1.4).	
Do endorsed regional or local variations to the acceptable solutions apply to the assessments against the Bushfire Protection Criteria for the proposed development /use?	None known or identified

5.3 Assessment Statements for Element 1: Location

LOCATION					
Element Intent	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.				
Proposed Development/Use – Relevant Planning Stage	(Do) Development application other than for a single dwelling, ancillary dwelling or minor development				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
E1 Location				**Compliant:**	Yes
A1.1 Development location		**Applicable:**	Yes	**Compliant:**	Yes
ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES					
☑ ☐ ☐ The development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.					
Supporting Assessment Details: The proposed development will provide an area of land within the lot that can be considered suitable for development as BAL-40 or BAL-FZ construction requirements will not be required to be applied. This meets the requirements established by Acceptable Solution A1.1 and its associated explanatory note. In addition, the vegetation surrounding the proposed development can be classed as a moderate bushfire hazard level.					
ASSESSMENTS APPLYING THE GUIDANCE ESTABLISHED BY THE WAPC ELEMENT 1 & 2 POSITION STATEMENT (2019)					
"Consideration should be given to the site context where 'area' is the land both within and adjoining the subject site. The hazards remaining within the site should not be considered in isolation of the hazards adjoining the site, as the potential impact of a bushfire will be dependent on the wider risk context, including how a bushfire could affect the site and the conditions for a bushfire to occur within the site." **Strategic Planning Proposals:** Consider the threat levels from any vegetation adjoining and within the subject site for which the potential intensity of a bushfire in that vegetation would result in it being classified as an Extreme Bushfire Hazard Level (BHL). Identify any proposed design strategies to reduce these threats. **Structure Plans (lot layout known) and Subdivision Applications:** As for strategic planning proposals but within the subject site the relevant threat levels to consider are the radiant heat levels represented by BAL-FZ and BAL-40 ratings.					

The planning proposal is a development application, consequently the referenced position statement is not applicable to the Element 1 assessment.

5.4 Assessment Statements for Element 2: Siting and Design

SITING AND DESIGN OF DEVELOPMENT					
Element Intent	To ensure that the siting and design of development minimises the level of bushfire impact. (BPP Note: not building/construction design)				
Proposed Development/Use – Relevant Planning Stage	(Do) Development application other than for a single dwelling, ancillary dwelling or minor development				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
E2 Siting and Design of Development				**Compliant:**	Yes
A2.1 Asset Protection Zone (APZ)		**Applicable**:	Yes	**Compliant**:	Yes

APZ DIMENSIONS – DIFFERENCES IN REQUIREMENTS FOR PLANNING ASSESSMENTS COMPARED TO IMPLEMENTATION

A key required bushfire protection measure is to reduce the exposure of buildings/infrastructure (as exposed vulnerable elements at risk), to the direct bushfire threats of flame contact, radiant heat and embers and the indirect threat of consequential fires that result from the subsequent ignition of other combustible materials that may be constructed, stored or accumulate in the area surrounding these structures. This reduces the associated risks of damage or loss.

This is achieved by separating buildings (and consequential fire fuels as necessary) from areas of classified bushfire prone vegetation. This area of separation surrounding buildings is identified as the Asset Protection Zone (APZ) and consists of no vegetation and/or low threat vegetation or vegetation continually managed to a minimal fuel condition. The required separation distances will vary according to the site specific conditions and local government requirements.

The APZ dimensions stated and/or illustrated in this Report can vary dependent on the purpose for which they are being identified.

> *Note: Appendix B 'Onsite Vegetation Management' provides further information regarding the different APZ dimensions that can be referenced, their purpose and the specifications of the APZ that are to be established and maintained on the subject lot.*

THE 'PLANNING BAL-29' APZ DIMENSIONS

Purpose: To provide evidence of the development or use proposal's ability to achieve minimum vegetation separation distances. To achieve 'acceptable solution' planning approval for this factor, it must be demonstrated that the minimum separation distances corresponding to a maximum level of radiant transfer to a building of 29 kW/m^2, either exist or can be implemented (with certain exceptions). These separation distances are the 'Planning BAL-29' APZ dimensions.

The 'Planning BAL-29' APZ is not necessarily the size of the APZ that must be physically implemented and maintained by a landowner. Rather, its sole purpose is to identify if an acceptable solution for planning approval can be met.

THE 'REQUIRED' APZ DIMENSIONS

Purpose: Establishes the dimensions of the APZ to be physically implemented by the landowner on their lot: These will be the minimum required separation distances from the subject building(s) to surrounding bushfire prone vegetation (identified by type and associated ground slope). These are established by:

A. The 'BAL Rating APZ' of the subject building(s) when distances are greater than 'B' below (except when 'B' establishes a maximum distance); or

B. The 'Local Government' APZ' derived from the Firebreak/Hazard Reduction Notice when distances are greater than 'A' above, other than when a maximum distance is established, in which case this will apply; or

C. A combination of 'A' and 'B'.

> *Within this Report/Plan it is the **'Planning BAL-29' APZ** that will be identified on maps, diagrams and in tables as necessary – unless otherwise stated.*
>
> *The **'Required' APZ** dimension information will be presented in Appendix B1.1 and on the Property Bushfire Management Statement, when required to be included for a development application.*

ASSESSMENT AGAINST THE REQUIREMENTS ESTABLISHED BY THE GUIDELINES

☑ ☐ ☐	**APZ Width:** The proposed (or a future) habitable building(s) on the lot(s) of the proposed development - or an existing building for a proposed change of use – can be (or is) located within the developable portion of the lot and be surrounded by a 'Planning BAL-29' APZ of the required dimensions (measured from any external wall or supporting post or column to the edge of the classified vegetation), that will ensure their exposure to the potential radiant heat impact of a bushfire does not exceed 29 kW/m^2.
☐ ☐ ⊘	**Restriction on Building Location:** It has been identified that the current developable portion of a lot(s) provides for the proposed future (or a future) building/structure location that will result in that building/structure being subject to a BAL-40 or BAL-FZ rating. Consequently, it may be considered necessary to impose the condition that a restrictive covenant to the benefit of the local government pursuant to section 129BA of the Transfer of Land Act 1893, is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of that portion of land (refer to Code F3 of Model Subdivision Conditions Schedule, WAPC June 2021 and Guidelines s5.3.2).
☑ ☐ ☐	**APZ Location:** The required dimensions for a 'Planning BAL-29' APZ can be contained solely within the boundaries of the lot(s) on which the proposed (or a future) habitable building(s) - or an existing building(s) for a proposed change of use – is situated.
☐ ☐ ⊘	**APZ Location:** The required dimensions for a 'Planning BAL-29' APZ can be partly established within the boundaries of the lot(s) on which the proposed (or a future) habitable building(s) - or an existing building(s) for a proposed change of use – is situated. The balance of the APZ would exist on adjoining land that satisfies the exclusion requirements of AS 3959:2018 cl 2.2.3.2 for non-vegetated areas and/or low threat vegetation and/or vegetation managed in a minimal fuel condition.
☐ ☐ ⊘	**APZ Location:** It can be justified that any adjoining (offsite) land forming part of a 'Planning BAL-29' APZ will: • If non-vegetated, remain in this condition in perpetuity; and/or • If vegetated, be low threat vegetation or vegetation managed in a minimal fuel condition in perpetuity.

☑ ☐ ☐	**APZ Management:** The area of land (within each lot boundary), that is to make up the required 'Landowner' APZ dimensions (refer to Appendix B, Part B1), can and will be managed in accordance with the requirements of the Guidelines Schedule 1 'Standards for Asset Protection Zones' (refer to Appendix B).
☐ ☐ ⊘	**Staged Subdivision:** The subdivision proposes development in stages and each stage is to comply with the relevant bushfire protection criteria. A balance lot is created or classified vegetation within a subsequent stage will be removed and/or modified and/or be subject to ongoing management, to ensure that proposed lots within the current stage of the subdivision achieve a development site subject to 29 kW/m^2 or below. The planned approach for achieving the required outcome is described in the supporting assessment details below.
☑ ☐ ☐	**Firebreak/Hazard Reduction Notice:** Any additional requirements established by the relevant local government's annual notice to install firebreaks and manage fuel loads (issued under s33 of the Bushfires Act 1954), can and will be complied with.

Supporting Assessment Details: Asset protection zones can be contained solely within the boundaries of the subject land.

The APZ that will exist will likely consist of, but is not limited to a combination of the following:

- Roads /Hardstand Areas
- Parking bays

APZ Management Within the Subject Land:

Refer to Figures 3.1b and 3.2 - The exclusion requirements of s2.2.3.2 of AS3959 demonstrates that vegetation that is onsite is within the control of the subject site's landowner and therefore can potentially be removed or modified to mitigate the bushfire risk.

APZ Management Outside the Subject Land:

Not Applicable – The Subject Land is of sufficient size to ensure that any proposed habitable buildings can be surrounded by an APZ to ensure their exposure to the potential radiant heat impact of a bushfire does not exceed 29 kW/m^2 (BAL-29).

APZ Management - General: Where any part of the required APZ dimension is vegetated for the purposes of landscaping, it will be managed in accordance with the technical requirements established by the Schedule 1: 'Standards for Asset Protection Zones (Guidelines). The APZ specifications are also detailed in Appendix 1 and the Shire of Gingin.

ASSESSMENTS APPLYING THE GUIDANCE ESTABLISHED BY THE WAPC ELEMENT 1 & 2 POSITION STATEMENT (2019)

Strategic Planning Proposals: "At this planning level there may not be enough detail to demonstrate compliance with this element. The decision-maker may consider this element is satisfied where A1.1 is met."

Structure Plans (lot layout known) and Subdivision Applications: "Provided that Element 1 is satisfied, the decision-maker may consider approving lot(s) containing BAL-40 or BAL-FZ under the following scenarios.

The planning proposal is a development application, consequently the referenced position statement is not applicable to the proposed development.

5.5 Assessment Statements for Element 3: Vehicular Access

VEHICULAR ACCESS					
Element Intent	To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.				
Proposed Development/Use – Relevant Planning Stage	(Do) Development application other than for a single dwelling, ancillary dwelling or minor development				
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.				
Pathway Applied to Provide an Alternative Solution	N/A				
Acceptable Solutions - Assessment Statements *All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.* *The technical construction requirements for access types and components, and for each firefighting water supply component, are also presented in Appendices C and D. The local government will advise the proponent where different requirements are to apply and when any additional specifications such as those for signage and gates are to apply (these are included in the relevant appendix if requested by the local government).*					
Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
E3 Vehicular Access				**Compliant:**	Yes
A3.1 Public roads		**Applicable**:	Yes	**Compliant**:	Yes
☑ ☐ ☐	The technical construction requirements of vertical clearance and weight capacity (Guidelines, Table 6) can and will be complied with (Refer also to Appendix C in this BMP).				
☑ ☐ ☐	All other applicable technical requirements of trafficable width, gradients and curves, are required to be in "accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Ausroad Standards and/or any applicable standard in the local government area" (Guidelines, Table 6 and E3.1. Refer also to Appendix C in this BMP). The assessment conducted for the bushfire management plan indicates that it is likely that the proposed development can and will comply with the requirements. However, the applicable class of road, the associated technical requirements and subsequent proposal compliance, will need to be confirmed with the relevant local government and/or Main Roads WA. or The applicable class(s) of road and technical requirements have been confirmed with the relevant local government/Main Roads WA. These can and will be complied with.				
☑ ☐ ☐	A traversable verge is available adjacent to classified vegetation (Guidelines, E3.1), as recommended.				
Supporting Assessment Details: None Required.					

A3.2a Multiple access routes	Applicable: Yes	Compliant: Yes
☑ ☐ ☐	For the lot, two-way public road access is provided in two different directions to at least two different suitable destinations with an all-weather surface.	
☐ ☐ ⊘	The two-way access is available at an intersection no greater than 200m from the relevant boundary of each lot, via a no-through road.	
☐ ☐ ⊘	The two-way access is not available at an intersection within 200m from the relevant boundary of each lot. However, the available no-through road satisfies the established exemption for the length limitation in every case. These requirements are: • Demonstration of no alternative access (refer to A3.3 below); • The no-through road travels towards a suitable destination; and • The balance of the no-through road that is greater than 200m from the relevant lot boundary is within a residential built-out area or is potentially subject to radiant heat levels from adjacent bushfire prone vegetation that correspond to the BAL-LOW rating (<12.5 kW/m^2).	
Supporting Assessment Details: Refer to Figures 1.4, 1.5 and 3.1a - Public Road access is provided for in two different directions to two different destinations via Wannamal Road West, located immediately adjacent to the Subject Site.		
A3.2b Emergency access way	**Applicable:** No	**Compliant:** N/A
☐ ☐ ⊘	The proposed or existing EAW provides a through connection to a public road.	
☐ ☐ ⊘	The proposed or existing EAW is less than 500m in length and will be signposted and gated (remaining unlocked) to the specifications stated in the Guidelines and/or required by the relevant local government.	
☐ ☐ ⊘	The technical construction requirements for widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.2b. Refer also to Appendix C in this BMP), can and will be complied with.	
☐ ☐ ⊘	The subdivision proposes development in stages and each stage is to comply with the relevant bushfire protection criteria. A temporary EAW is planned to facilitate the staging arrangements of a subdivision as an interim second access route until the required second access route is constructed as a public road in a subsequent stage. The planned approach for achieving the required outcome is described in the supporting assessment details below.	
Supporting Assessment Details: None Required.		
A3.3 Through-roads	**Applicable:** No	**Compliant:** N/A
☐ ☐ ⊘	A no-through public road is necessary as no alternative road layout exists due to site constraints.	
☐ ☐ ⊘	The no-through public road length does not exceed the established maximum of 200m to an intersection providing two-way access (Guidelines, E3.3).	
☐ ☐ ⊘	The no-through public road exceeds 200m but satisfies the exemption provisions of A3.2a as demonstrated in A3.2a above.	

☐ ☐ ⊘	The public road technical construction requirements (Guidelines, Table 6 and E3.1. Refer also to Appendix C in this BMP), can and will be complied with as established in A3.1 above.
☐ ☐ ⊘	The turnaround area requirements (Guidelines, Figure 24) can and will be complied with.
Supporting Assessment Details: None Required.	

A3.4a Perimeter roads	**Applicable**:	No	**Compliant**:	N/A

☐ ☐ ⊘	The proposed greenfield or infill development consists of 10 or more lots (including those that are part of a staged subdivision) and therefore should have a perimeter road. This is planned to be installed.
☐ ☐ ⊘	The proposed greenfield or infill development consists of 10 or more lots (including those that are part of a staged subdivision). However, it is not required on the established basis of: • The vegetation adjoining the proposed lots is classified Class G Grassland; • Lots are zoned rural living or equivalent; • It is demonstrated that it cannot be provided due to site constraints; or • All lots have existing frontage to a public road.
☐ ☐ ⊘	The technical construction requirements of widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.4a) can and will be complied with.
Supporting Assessment Details: None Required.	

A3.4b Fire service access route	**Applicable**:	No	**Compliant**:	N/A

☐ ☐ ⊘	The FSAR can be installed as a through-route with no dead ends, linked to the internal road system every 500m and is no further than 500m from a public road.
☐ ☐ ⊘	The technical construction requirements of widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.4b. Refer also to Appendix C in this BMP), can and will be complied with.
☐ ☐ ⊘	The FSAR can and will be signposted. Where gates are required by the relevant local government, the specifications can be complied with.
☐ ☐ ⊘	Turnaround areas (to accommodate type 3.4 fire appliances) can and will be installed every 500m on the FSAR.
Supporting Assessment Details: None Required.	

A3.5 Battle-axe access legs	**Applicable**:	No	**Compliant**:	N/A

☐ ☐ ⊘	A battle-axe leg cannot be avoided due to site constraints.
☐ ☐ ⊘	The proposed development is in a reticulated area and the battle-axe access leg length from a public road is no greater than 50m. No technical requirements need to be met.
☐ ☐ ⊘	The proposed development is not in a reticulated area. The technical construction requirements for widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.5. Refer also to Appendix C in this BMP), can and will be complied with.

☐ ☐ ⊘	Passing bays can and will be installed every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m.
Supporting Assessment Details: None Required.	

A3.6 Private driveways	**Applicable**: Yes	**Compliant**: Yes
☐ ☐ ⊘	The private driveway to the most distant external part of the development site is within a lot serviced by reticulated water, is accessed via a public road with a speed limit of 70 km/hr or less and has a length is no greater than 70m (measured as a hose lay). No technical requirements need to be met.	
☑ ☐ ☐	The technical construction requirements for widths, clearances, capacity, gradients and curves (Guidelines, Table 6 and E3.6. Refer also to Appendix C in this BMP), can and will be complied with.	
☑ ☐ ☐	Passing bays can and will be installed every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m.	
☑ ☐ ☐	The turnaround area requirements (Guidelines, Figure 28, and within 30m of the habitable building) can and will be complied with.	
Supporting Assessment Details: Refer to Figures 1.2 and 1.4 contained within this plan – An internal access road will be available throughout the site. As this access will be in loop formation and a minimum of ten (10) metres in width, this provides both turn-around and passing bay opportunities at regular intervals, thus achieving compliance with this Acceptable Solution.		

5.6 Assessment Statements for Element 4: Water

WATER	
Element Intent	To ensure water is available to enable people, property and infrastructure to be defended from bushfire.
Proposed Development/Use – Relevant Planning Stage	(Do) Development application other than for a single dwelling, ancillary dwelling or minor development
Element Compliance Statement	The proposed development/use achieves the intent of this element by being fully compliant with all applicable acceptable solutions.
Pathway Applied to Provide an Alternative Solution	N/A

Acceptable Solutions - Assessment Statements

All details of acceptable solution requirements are established in the Guidelines for Planning in Bushfire Prone Areas, DPLH v1.4 (Guidelines) and apply the guidance established by the Position Statement: 'Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design' (WAPC Nov 2019) and the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (WA Department of Planning, Lands and Heritage, 2021 Rev B) as relevant. These documents are available at https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas.

The technical construction requirements for access types and components, and for each firefighting water supply component, are also presented in Appendices C and D. The local government will advise the proponent where different requirements are to apply and when any additional specifications such as those for signage and gates are to apply (these are included in the relevant appendix if requested by the local government).

Solution Component Check Box Legend	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant

E4 Water	**Compliant:**	Yes

A4.1 Identification of future firefighting water supply	**Applicable**:	No	**Compliant**:	N/A

☑ ☐ ☐	It can be demonstrated that reticulated or sufficient non-reticulated water for firefighting can be provided at the subdivision and/or development application stage in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2.

Supporting Assessment Details: None Required.

A4.2 Provision of water for firefighting purposes	**Applicable**:	Yes	**Compliant**:	Yes

☐ ☐ ⃠	A reticulated water supply is available to the proposed development. The existing hydrant connection(s) are provided in accordance with the specifications of the relevant water supply authority.
☐ ☐ ⃠	A reticulated water supply will be available to the proposed development. Hydrant connection(s) can and will be provided in accordance with the specifications of the relevant water supply authority.
☑ ☐ ☐	A static water supply for firefighting purposes will be installed on the lot that is additional to any water supply that is required for drinking and other domestic purposes.
☐ ☐ ⃠	A strategic water supply (tank or tanks) for firefighting purposes will be installed within or adjacent to the proposed development that is additional to any water supply that is required for drinking and other domestic purposes. The required land will be ceded free of cost to the local government and the lot or road reserve where the tank is to be located will be identified on the plan of subdivision.

☐ ☐ ⊘	The strategic static water supply (tank or tanks) will be located no more than 10 minutes travel time from a subject site (at legal road speeds).
☑ ☐ ☐	The technical requirements (location, number of tanks, volumes, design, construction materials, pipes and fittings), as established by the Guidelines (A4.2, E4 and Schedule 2) and/or the relevant local government, can and will be complied with.

Supporting Assessment Details:

Refer to the Notes contained within Figure 1.2 of this Plan in conjunction with the Addendum (Fire Management Plan – Prepared by Bioscience) contained within this Bushfire Management Plan - A dedicated static water supply will be available within the subject lot by two (2) 30,000 litre transportable tanks which will be maintained to full capacity via the existing, onsite bore and/or from the existing dam (Refer to Photo ID: 12). Where required - These should include suitable couplings and fittings to protect any onsite assets.

In addition to the above – Two (2) Large water tankers with high volume discharge pumps will be available. Their capabilities include a combination of the following:

- Tanker 1 – "Dinosaur" Water Cart:
  - 20,000 Litre Capacity
  - Dust control during daily operations.
  - Windrow water application.
  - Fire fighting.
- Tanker 2:
  - 20,000 Litre Capacity.
  - Trailer mounted high volume discharge pump.
  - Dedicated solely to fire fighting purposes.

As with the two (2) 30,000 litre transportable tanks mentioned above – The water tankers should also include suitable couplings and fittings to protect any onsite assets.

Refer to information contained in Appendix D for the firefighting water supply specifications and technical requirements in conjunction with the Addendum 'GL-06: Acceptable Sources of Water Supply for Fire Hydrant/Sprinkler Systems. (Bores, Dams, Rivers, Lakes and Seawater)'.

Refer to information contained in Appendix D for the firefighting water supply specifications and technical requirements.

5.7 Additional Bushfire Protection Measures to be Implemented

The following bushfire protection measures are recommended to be implemented and maintained. They are additional to, or a variation of, those established by the relevant acceptable solutions applied to the proposed development/use within Sections 5 of this BMP (as applicable to the proposed development).

The intent of their application is to improve the bushfire performance of the proposed development/use and reduce residual risk levels to persons and property from a bushfire event.

The development of these additional and/or varied protection measures originates the following potential sources (not exhaustive):

1. Out of the relevant merit based assessment when the Section titled 'Non-compliance – Additional Assessments' has been used in this BMP;
2. Out of the relevant performance based assessment when Section titled 'Non-compliance – Additional Assessments' has been used in this BMP;
3. Out of the development of any other required bushfire planning documents. These include a Bushfire Emergency Plan and the Bushfire Risk Assessment and Management Report;
4. Out of any additional bushfire planning guidance documents or position statements issued by the WA Department of Planning, Lands and Heritage;
5. From any 'Conditions' which may be applied to a 'Planning Approval' or a 'Notice of Determination; or
6. As a recommendation from the bushfire consultant.

The following table summarises the requirements/recommendations with the detail provided in the following sections.

When necessary, the implementation responsibility for these additional protection measures will be stated in Section 6 of this BMP and included in other operational documents as relevant.

SUMMARY OF ADDITIONAL BUSHFIRE PROTECTION MEASURES TO BE IMPLEMENTED - AS DETERMINED BY BIOSCIENCE					
No.	Description of the Protection Measure to Apply to the Proposed Development	Risk Reducing Component Being Applied		The Assessment or Document Establishing the Application of the Protection Measure	Application Status
		Type	Protection Principle		
1	**Fire Fighting Equipment** The site will maintain in good order, two large water tankers, equipped with high volume discharge pumps. The major tanker with be a conventional 20,000 L "Dinosaur" water cart. It will have multiple uses, including: 1) Dust control of surfaces during construction and operations, using rear discharge sprays, 2) Windrow water application using a side discharge spray and 3) Firefighting using a top mounted fire-fighting nozzle. The second tanker will also have 20,000 L capacity and a high- volume discharge pump. It will be trailer mounted and only used for fire-fighting. If needed it will be coupled to a front-end loader and towed to the fire. Both water tankers will be gravity filled from 2 overhead 30,000 L tanks which will be maintained full, either from the onsite bore, or from the leachate/stormwater holding dam constructed at the centre of the compost pad (Figure 1).	Threat Reduction	N/A	As determined by Bioscience.	As determined by Bioscience. Future inclusion in relevant responsibilities established in Section 6 will be dependent on the planning decision maker establishing a condition of approval.
		Exposure Reduction - Persons	N/A		
		Exposure Reduction – Structures/Assets	N/A		
		Vulnerability Reduction - Persons	N/A		
		Vulnerability Reduction – Structures/Assets	Establish/Improve Firefighting Capability		
2	**Composting Operations** DFES guidance teaches the risk of fires in green waste are greatest when material moisture content is between 20 to 45% water on a weight/weight basis, and where stockpiles of materials are sufficiently large that surface area to mass ratios are low.	Threat Reduction	Prevent bushfire ignition by controlling heat energy sources.	As determined by Bioscience.	As determined by Bioscience. Future inclusion in relevant responsibilities established in Section 6 will be dependent on the planning decision maker
		Exposure Reduction - Persons	N/A		
		Exposure Reduction – Structures/Assets	N/A		

	The risk of fires by spontaneous combustion are substantially lowered by maintaining moisture above 45%. Where green waste materials are stored prior to grinding, chipping, they should be in a dry state (less than 20% water) with pile dimensions maximally: • Length 50 m • Width 10 m • Height 5 m Further, adequate separation distances between potentially combustible material piles should be separated by: • 24 m separation between each 50 m length windrow. • 41 m separation width between adjacent windrows.	Vulnerability Reduction - Persons	N/A		establishing a condition of approval.
		Vulnerability Reduction – Structures/Assets	Applies Design and Construction (Materials) to Improve Resilience to Bushfire Threats		
3	**<u>Operational Parameters</u>** It is anticipated that materials will be received in one of two possible conditions, being materials that have been ground or chipped to an adequate size suitable for composting, or oversize materials requiring grinding or chipping. Materials that are suitable for composting will be laid out in windrows as soon as practicable. Laid windrows will immediately have water added to 55% w/w. Oversize material requiring grinding or chipping will not have water added to them, but rather will be set aside in piles of stored green waste with the above maximum dimensions until these is sufficient volume to warrant contacted operators to come to the site to undertake grinding and chipping operations. Such piles should be kept as open as possible to allow air circulation.	Threat Reduction	Prevent bushfire ignition by controlling heat energy sources.	As determined by Bioscience.	As determined by Bioscience. Future inclusion in relevant responsibilities established in Section 6 will be dependent on the planning decision maker establishing a condition of approval.
		Exposure Reduction - Persons	N/A		
		Exposure Reduction – Structures/Assets	N/A		
		Vulnerability Reduction - Persons	N/A		
		Vulnerability Reduction – Structures/Assets	Ensure Effectiveness Of Applied Protection Measures is Maintained		
4	**<u>Daily Composting Operations</u>**	Threat Reduction	Prevent bushfire ignition by controlling heat energy sources.	As determined by Bioscience.	As determined by Bioscience. Future inclusion in relevant

	At the beginning of the business day, staff will routinely measure the temperate and moisture content of each operating windrow at least once per 10 linear meters of windrow. Data will be recorded on a field sheet and considered by the operations manager to set the priority task operations schedule for the day. The first priority will be to add water to windrows found to be less that 45%. The second priority will be to use front end loaders to shift piles that are above 55 degrees, to thereby aerate and cool windrows to optimal composting temperature. Each batch windrow a have daily temperature and moisture recorded, and such records will note when water is added and when the pile is turned. It is anticipated that as composting proceeds, windrow size will shrink. Accordingly three adjacent windows will be combined into two windrows. When windrow temperatures drop below 35 degrees for two consecutive days, the composting process will be deemed to have been completed. That windrow will be carried by front end loaders to the finished compost storage area. Green-waste storage windrows should likewise have temperature and moisture content. measured and recorded daily. If the temperature is greater than 45 degrees, the pile should not be watered, but should be aerated using a front-end loader. Stored, finished compost piles will have temperatures measured and recorded weekly. If temperature rise to greater than 40 degrees they will be aerated with a front end loader.	Exposure Reduction - Persons	N/A		responsibilities established in Section 6 will be dependent on the planning decision maker establishing a condition of approval.
		Exposure Reduction – Structures/Assets	N/A		
		Vulnerability Reduction - Persons	N/A		
		Vulnerability Reduction – Structures/Assets	Ensure Effectiveness Of Applied Protection Measures is Maintained		

5	**Avoidance of External Fire Source** No smoking will be allowed on the composting pad. No equipment likely to cause sparks (welding equipment or angle grinders) will be used within the composting pad area	Threat Reduction	Prevent bushfire ignition by controlling heat energy source and fuel interactions	As determined by Bioscience.	As determined by Bioscience. Future inclusion in relevant responsibilities established in Section 6 will be dependent on the planning decision maker establishing a condition of approval.
		Exposure Reduction - Persons	N/A		
		Exposure Reduction – Structures/Assets	N/A		
		Vulnerability Reduction - Persons	N/A		
		Vulnerability Reduction – Structures/Assets	N/A		
6	**Fire Outbreak Response** Any fire outbreak within the composting facility will be responded to immediately by all available staff. Both water carts will be mobilized to direct water at high volume/low pressure at the core of the fire. An excavator will be used to separate the non- burning material from the burning material. Burning materials will be spread out on the compost pad and saturated with water. Operators will remain in attendance until the fire is completely out. A front-end loader will pick up the burned material to verify it is completely extinguished. Once the fire is out, investigations will be undertaken to determine the cause such that this Fire Management Plant will be reviewed and revised as necessary by the operations manager and directors. A report of the fire will be prepared for the Shire of Gingin and DFES.	Threat Reduction	Prevent bushfire ignition and/or severity by controlling the fuel.	As determined by Bioscience.	As determined by Bioscience. Future inclusion in relevant responsibilities established in Section 6 will be dependent on the planning decision maker establishing a condition of approval.
		Exposure Reduction - Persons	Separation from Bushfire Threats		
		Exposure Reduction – Structures/Assets	Separation from Bushfire Threats		
		Vulnerability Reduction - Persons	N/A		
		Vulnerability Reduction – Structures/Assets	Establish/Improve Firefighting Capability		
7	**Bushfire Resilient Construction – Proposed Buildings/Structures** Any future buildings such as a Transportable Site Office, Ablutions and the like are not required to comply with the bushfire performance requirements established by the Building Code of Australia (Vol. 1 & 2 of the National	Threat Reduction	N/A	A recommendation from the bushfire consultant.	Recommended only. Future inclusion in relevant responsibilities established in Section 6 will be dependent on the planning decision maker
		Exposure Reduction - Persons	N/A		
		Exposure Reduction – Structures/Assets	N/A		
		Vulnerability Reduction - Persons	N/A		

	Construction Code) that are referenced by the Building Regulations 2012 (WA Building Act 2011). However, it is recommended (by the bushfire consultant) that these building works be constructed to the requirements corresponding to their determined BAL rating to the greatest extent practical. Consideration may need to be given to the protection principles established by these requirements, rather than specific construction detail, when it does not directly apply to the proposed type of construction – and adjust construction requirements accordingly. The bushfire construction requirements corresponding to BAL ratings are established by AS 3959:2018 – Construction of buildings in bushfire prone areas and/or the NASH Standard (NS 300 2021) – Steel framed construction in bushfire areas (for Class 1 buildings). *At a minimum*, buildings must have exposed subfloor spaces/cavities enclosed, sealed with non-combustible material, have or ember screened. Ember screening mesh is to be maximum 2mm aperture and composed of corrosion-resistant steel, bronze, or aluminium.	Vulnerability Reduction – Structures/Assets	Applies Design and Construction (Materials) to Improve Resilience to Bushfire Threats		establishing a condition of approval.
8	**<u>Site Operating Procedures</u>** The future Site Operating Procedures should contain the following information: • Hot works should not occur near bushfire prone vegetation (particularly during the bushfire season). Mobile equipment should avoid contact with bushfire prone vegetation (e.g. vehicle undercarriage).	Threat Reduction	Prevent bushfire ignition by controlling heat energy source and fuel interactions	A recommendation from the bushfire consultant.	Recommended only. Future inclusion in relevant responsibilities established in Section 6 will be dependent on the planning decision maker establishing a condition of approval.
		Exposure Reduction - Persons	N/A		
		Exposure Reduction – Structures/Assets	Separation from Bushfire Threats		
		Vulnerability Reduction - Persons	Provision of Bushfire Emergency Information and Education		

	• Consequential fire fuels should be maintained >6m from major assets such as vehicle/plant parking and structures. This does not apply to windrows/stockpiles. Consequential hazards include rubbish bins, fuel jerry cans, cardboard boxes, vegetative waste, and any object composed of plastic or wood. • A role/staff member should be nominated as being responsible for identifying and communicating Fire Danger Ratings, Harvest and Vehicle Movement Bans, Total Fire Bans, and bushfire alerts. These may be sourced from the Shire of Gingin, an automatic notification system, Emergency WA, or ABC AM radio (720; 531) or 6PR (882).	Vulnerability Reduction – Structures/Assets	N/A		
9	**<u>Emergency Management Plan</u>** The future Emergency Management Plan should contain the following information: • Identify which (if any) operations are to cease, or actions to take, where a bushfire is identified within 10km. Identified actions/operations should be those susceptible to ember attack. • Consequential fire fuels be moved >6m from major assets as a response to bushfire (ensuring compliance with the Site Operating Procedures above). • The Plan should be prepared in consideration with the *Guidelines for Planning in Bushfire Prone Areas* Section 5.5.4 'Developing a Bushfire Emergency Evacuation Plan'.	Threat Reduction	N/A	A recommendation from the bushfire consultant.	Recommended only. Future inclusion in relevant responsibilities established in Section 6 will be dependent on the planning decision maker establishing a condition of approval.
		Exposure Reduction - Persons	N/A		
		Exposure Reduction – Structures/Assets	Separation from Bushfire Threats		
		Vulnerability Reduction - Persons	Provision of Bushfire Emergency Information and Education		
		Vulnerability Reduction – Structures/Assets	Ensure Effectiveness Of Applied Protection Measures is Maintained		

6 RESPONSIBILITY CHECKLISTS FOR THE IMPLEMENTATION AND MANAGEMENT OF BUSHFIRE PROTECTION MEASURES

The following sections and their associated tables establish:

- The bushfire protection measures that shall be initially implemented and those requiring ongoing maintenance to the stated requirements;
- The persons responsible for the implementation and maintenance of the required bushfire protection measures; and
- The persons responsible and the timing for compliance certification when required.

The necessity for the BMP to contain this information is established by the *Guidelines for Planning in Bushfire Prone Areas* (Version 1.4, WAPC 2021) in Appendices 3 and 5.

6.1 Landowner / Operator Responsibilities Prior To Occupancy or Commencement of Operation

TABLE 6.2(A) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (SUBJECT TO COMPLIANCE CHECK TO BE CONDUCTED BY A BUSHFIRE CONSULTANT)	
1	Prior to occupancy/operation establish the 'Required' Asset Protection Zone (APZ) around any habitable buildings (and other structures as required) to satisfy: • The minimum required dimensions established in Appendix B1; and • The standards established by the *Guidelines for planning in bushfire prone areas,* DPLH, 2021 v1.4, Schedule 1; or • The standards established for an Asset Protection Zone (APZ) by the relevant local government's requirements set out in a section 33 notice under the Bush Fires Act 1954 (annual firebreak/fuel load notice); or • An alternative standard in a gazetted local planning scheme. If native vegetation is required to be modified or removed, ensure that approval has been received from the relevant authority (refer to the applicable local government for advice).
2	Prior to occupancy, construct the private driveways to comply with the technical requirements referenced in the BMP.
3	Prior to occupancy, ensure the required firefighting static water supply complies with the technical requirements stated in the BMP.
4	Prior to operation, for the proposed high risk land use, there is an outstanding obligation, created by this Bushfire Management Plan, for site and use specific, prevent, prepare, respond and recover bushfire procedures (and associated actions) to be incorporated into the operation's Site Emergency Plan that is a required document to address all potential emergencies and developed by the operator – The Decision Maker is to be satisfied with the treatments recommended and referenced in this plan.
5	Implement the additional bushfire protection measures that have been established within Section 5.7 of this BMP as measures additional to those established by the acceptable solutions.

TABLE 6.2(B) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (SUBJECT TO COMPLIANCE BEING ESTABLISHED BY THE WAPC AND/OR LOCAL GOVERNMENT)	
1	[Relevant when stated as a condition of planning approval] The landowner/proponent is to register a notification onto the certificate of title and deposited plan (with the required wording stated by the local government). This will be done pursuant to *Section 70A Transfer of Land Act 1893 (as amended) as per 'Factors affecting use and enjoyment of land, notification on title'*. This is to notify owners and prospective purchasers of the land that: 1. The land is in a designated bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner; 2. The land is subject to a Bushfire Management Plan that establishes certain protection measures to manage bushfire risk that are to be implemented and continue to be applied at the owner's cost; and 3. That additional planning and building requirements may apply to development on this land.
2	Prior to operation of the lot, it is to be compliant with current version of Shire of Gingin Firebreak Order & Bushfire Information issued under s33 of the Bushfires Act 1954. Where the Notice includes a standard for asset protection zones, this may differ from the standards established for an Asset Protection Zone (APZ) by the Guidelines DPLH, 2021 v1.4, Schedule 1 (refer to Appendix B), with the intent to better satisfy local conditions. An alternative standard in a gazetted local planning scheme may also apply to the subject lot(s).

TABLE 6.2(C) REQUIRED BUSHFIRE PROTECTION MEASURES - IMPLEMENTATION ACTIONS (NOT SUBJECT TO COMPLIANCE CHECK)	
1	Prior to any potential building work, inform the builder of the existence of this approved Bushfire Management Plan (BMP). The plan identifies that the development site is within a designated bushfire prone area and states the indicative (or determined) BAL rating(s) that may (or will) be applied to buildings/structures. A BAL assessment report may be required to confirm determined ratings and will be required when ratings are indicative. BAL certificates will need to be issued to accompany building applications. The BMP may also establish, as an additional bushfire protection measure, that construction requirements to be applied will be those corresponding to a specified higher BAL rating. Compliance with the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks). Other classes of buildings may also be required to comply with these construction when established by the relevant authority or if identified as an additional bushfire protection measure within the BMP. The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended).

6.2 Landowner / Occupier / Operator Responsibilities – Ongoing Management

TABLE 6.3 REQUIRED BUSHFIRE PROTECTION MEASURES – ONGOING MANAGEMENT ACTIONS	
1	Maintain the 'Required' Asset Protection Zone (APZ) around any habitable buildings (and other structures as required) to satisfy: • The minimum required dimensions established in Appendix B1; and • The standards established by the *Guidelines for planning in bushfire prone areas,* DPLH, 2021 v1.4, Schedule 1; or • The standards established for an Asset Protection Zone (APZ) by the relevant local government's requirements set out in a section 33 notice under the Bush Fires Act 1954 (annual firebreak/fuel load notice); or • An alternative standard in a gazetted local planning scheme; or • As specified in any Landscape Management Plan referenced in the approved BMP.
2	Comply with the Shire of Gingin Firebreak Order & Bushfire Information issued under s33 of the Bush Fires Act 1954. Check the notice annually for any changes.
3	Maintain vehicular access routes within the lot to comply with the technical requirements referenced in the BMP and the relevant local government's annual firebreak / hazard reduction notice.
4	Maintain the static firefighting water supply tank and associated pipes/fittings/pump and vehicle access and hardstand in good working condition.
5	Ensure that builders engaged to construct dwellings/additions and/or other relevant structures on the lot, are aware of the existence of this approved Bushfire Management Plan (BMP). The plan identifies that the development site is within a designated bushfire prone area and states the indicative (or determined) BAL rating(s) that may (or will) be applied to buildings/structures. A BAL assessment report may be required to confirm determined ratings and will be required when ratings are indicative. BAL certificates will need to be issued to accompany building applications. Compliance with the Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks). The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended). As an additional bushfire protection measure, other classes of buildings may also be required to comply with these construction requirements when established by the relevant authority or if identified as an additional bushfire protection measure within the BMP. The BMP may also establish that construction requirements to be applied will be those corresponding to a specified higher BAL rating. When applicable, these requirements will be identified in Section 5.7.
6	Maintain the bushfire protection measures that have been established within Section 5.7 of this BMP as measures additional to those established by the acceptable solutions.

7	Any Risk Management Plan containing bushfire risk management measures for flammable onsite hazards and operations with the potential to ignite a bushfire, must be reviewed each year and relevant information updated. All required measures must continue to be complied with.

6.3 Local Government Responsibilities – Ongoing Management

TABLE 6.4 REQUIRED BUSHFIRE PROTECTION MEASURES – ONGOING MANAGEMENT ACTIONS	
1	Monitor landowner compliance with the Bushfire Management Plan and the annual Shire of Gingin Fire Break Orders (firebreak notice).

APPENDIX A: DETAILED BAL ASSESSMENT DATA AND SUPPORTING INFORMATION

A1: BAL Assessment Inputs Common to the Method 1 and Method 2 Procedures

A1.1: FIRE DANGER INDICES (FDI/FDI/GFDI)

When using Method 1 the relevant FDI value required to be applied for each state and region is established by AS 3959:2018, Table 2.1. Each FDI value applied in Tables 2.4 – 2.7 represents both the Forest Fire Danger Index (FFDI) and a deemed equivalent for the Grassland Fire Danger Index (GFDI), as per Table B2 in Appendix B. When using Method 2, the relevant FFDI and GFDI are applied.

The values may be able to be refined within a jurisdiction, where sufficient climatological data is available and in consultation with the relevant authority.

Relevant Jurisdiction:	WA	Region:	Whole State	Method 1	Applied FDI:	80
				Method 2	Applied FFDI:	N/A
					Applied GFDI:	N/A

A1.2: VEGETATION ASSESSMENT AND CLASSIFICATION

Vegetation Types and Classification

In accordance with AS 3959:2018 Clauses 2.2.3 and C2.2.3.1, all vegetation types within 100 metres of the 'site' (defined as "the part of the allotment of land on which a building stands or is to be erected"), are identified and classified. Any vegetation more than 100 metres from the site that has influenced the classification of vegetation within 100 metres of the site, is identified and noted. The maximum excess distance is established by AS 3959: 2018 Clause 2.2.3.2 and is an additional 100 metres.

Classification is also guided by the Visual Guide for Bushfire Risk Assessment in WA (WA Department of Planning February 2016) and any relevant FPA Australia practice notes.

Modified Vegetation

The vegetation types have been assessed as they will be in their natural mature states, rather than what might be observed on the day. Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its expected re-generated mature state. Modified areas of vegetation can be excluded from classification if they consist of low threat vegetation or vegetation managed in a minimal fuel condition, satisfying AS 3959:2018 Clause 2.2.3.2(f), and there is sufficient justification to reasonable expect that this modified state will exist in perpetuity.

The Influence of Ground Slope

Where significant variation in effective slope exists under a consistent vegetation type, these will be delineated as separate vegetation areas to account for the difference in potential bushfire behaviour, in accordance with AS 3959:2018 Clauses 2.2.5 and C2.2.5.

THE INFLUENCE OF VEGETATION GREATER THAN 100 METRES FROM THE SUBJECT SITE	
Vegetation area(s) within 100m of the site whose classification has been influenced by the existence of bushfire prone vegetation from 100m – 200m from the site:	None
Assessment Statement:	No vegetation types exist close enough, or to a sufficient extent, within the relevant area to influence classification of vegetation within 100 metres of the subject site.

VEGETATION AREA 1				
Classification	**D. SCRUB**			
Types Identified	Closed scrub D-13 Open scrub D-14			
Exclusion Clause	N/A			
Effective Slope	Determined	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees
Justification Comments	Banksia and dryandra dominant scrub up to 5 metres tall and scattered marri trees. Understory of mixed native heath and some grasses. The vegetation is considered to be in its mature state.			
Post Development Assumptions:	Vegetation Area 1 is within the lot boundary and under the control of the landowner/developer. A portion of the vegetation will be removed to establish hardstand, structures and facilities.			

PHOTO ID: 1

PHOTO ID: 2

PHOTO ID: 3

PHOTO ID: 4

VEGETATION AREA 2				
Classification	**D. SCRUB**			
Types Identified	Closed scrub D-13 Open scrub D-14			
Exclusion Clause	N/A			
Effective Slope	Determined	d/slope 2 degrees	Applied Range (Method 1)	Downslope >0-5 degrees
Justification Comments	Banksia and dryandra dominant scrub up to 5 metres tall and scattered marri trees. Understory of mixed native heath and some grasses. The vegetation is considered to be in its mature state. Vegetation Area 2 has the same demographic and condition as Vegetation Area 1 and has been identified due to the slope relative to the proposed facility. Photographic evidence of Area 2 is not available.			
Post Development Assumptions:	Not Applicable.			
Vegetation Area 2 is continuous with and contains the same structure as Vegetation Area 1. Separate photographs have not been provided.				

<table>
<tr><th colspan="5">VEGETATION AREA 3</th></tr>
<tr><td>Classification</td><td colspan="4">A. FOREST</td></tr>
<tr><td>Types Identified</td><td colspan="4">Open forest A-03 Closed scrub D-13 Open scrub D-14</td></tr>
<tr><td>Exclusion Clause</td><td colspan="4">N/A</td></tr>
<tr><td>Effective Slope</td><td>Determined</td><td>flat 0 degrees</td><td>Applied Range (Method 1)</td><td>Upslope or flat 0 degrees</td></tr>
<tr><td>Justification Comments</td><td colspan="4">Marri trees 10-15 metres tall with 30% canopy cover. Understory of banksia, dryandra, and mixed natives and grasses.

Note: the vegetation was set back from cleared areas and difficult to reach for accurate sample photos.</td></tr>
<tr><td colspan="2">Post Development Assumptions:</td><td colspan="3">Not Applicable.</td></tr>
<tr><td colspan="3">  </td><td colspan="2"> 
</td></tr>
<tr><td colspan="3">PHOTO ID: 5</td><td colspan="2">PHOTO ID: 6</td></tr>
</table>

VEGETATION AREA 4				
Classification	**A. FOREST**			
Types Identified	Open forest A-03	Closed scrub D-13	Open scrub D-14	
Exclusion Clause	N/A			
Effective Slope	Determined	d/slope 2 degrees	Applied Range (Method 1)	Downslope >0-5 degrees
Justification Comments	Marri trees 10-15 metres tall with 30% canopy cover. Understory of banksia, dryandra, and mixed natives and grasses. Vegetation Area 4 has the same demographic and condition as Vegetation Area 3 and has been identified due to the slope relative to the proposed facility. Note: the vegetation was set back from cleared areas and difficult to reach for accurate sample photos.			
Post Development Assumptions:	Not Applicable.			

PHOTO ID: 7

PHOTO ID: 8

VEGETATION AREA 5				
Classification	**B. WOODLAND**			
Types Identified	Low woodland B-07 Low open woodland G-08			
Exclusion Clause	N/A			
Effective Slope	Determined	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees
Justification Comments	Banksia trees up to 5 metres tall with approximately 20% canopy cover. Understory of mixed native heath and some grasses. Dryandra and marri absent.			
Post Development Assumptions:	Not Applicable.			

PHOTO ID: 9

PHOTO ID: 10

VEGETATION AREA 6	
Classification	**EXCLUDED**
Exclusion Clause	2.2.3.2 (e) non-vegetated area
Justification Comments	Banksia trees up to 5 metres tall with approximately 20% canopy cover. Understory of mixed native heath and some grasses. Dryandra and marri absent.
Post Development Assumptions:	Not Applicable.

PHOTO ID: 11

PHOTO ID: 12

A1.3: EFFECTIVE SLOPE

EXPLAINING THE ASSESSMENT METHODOLOGY APPLIED BY BUSHFIRE PRONE PLANNING

DEFINITION: Effective slope is "the slope under that classified vegetation which most influences the bushfire attack" (AS 3959:2018, Clause 1.5.11).

"The effective slope under the classified vegetation is not the same as the average slope for the land surrounding the site of the proposed building. The effective slope is that slope which most significantly influences bushfire behaviour" (AS 3959:2018, Clause CB4).

The slope is described as upslope, flat or downslope when viewed from an exposed element (e.g., building) and looking towards the vegetation. It is measured in degrees.

[Note: Additional relevant guidance provided by AS 3959:2018 and NSW RFS, Planning for Bushfire Protection (2019) is incorporated into the applied assessment methodology and is presented at the end of this explanation.]

COMPOUND SLOPES UNDER VEGETATION AND DETERMINING SLOPE SIGNIFICANCE

Non-Linear Slopes: When the slope of ground under the vegetation out to the distance to be assessed (100 m or further if necessary), is not a straight line or nearly straight line slope, then it is made up of several different slopes i.e., it is a compound slope. The different slope angles and lengths must be factored into the determination of the effective slope value to be applied. Different slopes will potentially influence the bushfire rate of spread and intensity, both increasing and decreasing it.

Significant Slope: The AS 3959:2018 bushfire attack level determination methodology, with default inputs, models a fully developed bushfire. Therefore, a 'significant' slope is one that will significantly influence bushfire behaviour. To be 'significant' the length of the slope must be 'sufficient' to support a fully developed fire on that slope. The angle of a significant slope could be the determined effective slope for the area of classified vegetation if it is the one that 'most influences the bushfire attack'.

Sufficient Slope Length: Is a slope that will, as a minimum, allow the entire flame depth (flaming zone) of a fully developed fire (100m flame width) to exist on that slope.

The expected flame depth of a fully developed bushfire is a function of the length of time the flaming phase will exist on a section of the fuel bed (the 'residence time') and the bushfire's 'rate of spread'. For a given rate of spread, longer residence times result in greater flame depths. Greater flame depths are correlated with greater flame temperatures and greater flows of radiant heat.

The primary factors that will increase the residence time are:

- Heavier fine fuel loads of grass, leaf litter, twigs, bark etc less than 6mm in width and existing within the surface and near surface layers (and elevated fuel layers when contiguous with the base layers); and
- A greater percentage of larger fine fuels within the fuel load.

The primary factors that increase the rate of spread (apart from fire weather factors), include finer fuels, drier fuels, horizonal continuity of fuel and steeper upward ground slope in the direction of fire travel.

Example values:

- Residence Time: Grassfire 5 – 15 seconds, Forest fire 25 -50 seconds.
- Rate of Spread: Grassfires of a few km/hr are considered fast moving, 5-10 km/hr is common and fastest in the order of 25km/hr. Forest fire typically recorded in metres/hour with 1-1.5 km/hr being considered fast moving and fastest in the order of 3–4 km/hr.
- Flame Depth: More typically, a few metres for grasses to tens of metres for forest fires.

An Isolated Slope: For scenarios where there is a single significant slope (based on the above criteria) additional consideration would need to be given to the time and distance consumed by a bushfire still in its 'developing' phase. This will require due consideration be given to how it is potentially ignited i.e., from a single or multiple points, as this will influence the time and distance required to fully develop. For such scenarios, a normally significant slope may not be sufficiently long. It may be necessary to determine the potential bushfire impact more accurately by

justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width (using short fire run modelling).

Determined Effective Slope: Only a 'significant' slope can potentially be the effective slope by itself. In which case, for a defined area of classified vegetation area, the worst significant slope under that vegetation is to apply.

The table below presents Bushfire Prone Planning's considerations applied to assessing short and/or compound slopes in determining the effective slope.

Slope Length (m)	Considered a Significant Slope	Considerations in Determining the Effective Slope
< 5	No	Where these short slopes exist as part of a compound slope under an area of classified vegetation, they can be ignored as they will not influence the fire behaviour in that vegetation.
5-20	No	These slopes will have a range of influence on fire behaviour from very little to a degree of influence that must be accounted for to some extent by the determined effective slope that is applied (i.e., with a greater length apply to a greater extent). But the actual slope of these shorter slopes is likely not to be applied as it is not a 'significant' length.
20-30	Maybe	The same considerations applied to the 5-20m slope lengths should be applied here. However, more justification would need to be presented to support their assessment as not being 'significant' slopes. For these slope lengths, consideration must be given more broadly to the potential level of risks associated with a bushfire event in this location. The risk level will be a function of the bushfire hazard threat levels (direct attack mechanisms) within the immediate and broader assessment area as influenced by local topography, vegetation extents and types and the exposure and vulnerability of persons and/or buildings/structures to these threats. Higer risk levels require greater precaution meaning these slopes should be considered 'significant', and vice versa. Consider the potential for a bushfire on adjoining or nearby land be a source of ignition and/or pre-heating to vegetation on the subject slope. Consider if vegetation on the slope is likely be ignited by a single ignition point or is multipoint ignition possible from bushfire an adjoining slopes or the surrounding area. Single point ignition will require a fire to travel further before being fully developed (DFES considers less than 100m fire runs may be considered a short fire run for forest, woodland and scrub vegetation classifications, RFS NSW applies 150m). Isolated slopes of this length are less likely to be considered significant as compared to when part of a compound slope.
>30	Yes	Likely to always be a significant slope unless isolated (i.e., exists alone) – in which case, justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width, are approaches that may need to be applied.

BPP Approach - Slope Variation Within Areas of Vegetation

When multiple 'significant' slope lengths with large differences in degrees of effective slope (or different applicable slope ranges when AS 3959:2018 Method 1 is applied), exists under a single vegetation classification, these will be delineated as separate vegetation areas of classified vegetation to account for the difference in potential bushfire behaviour and impact, in accordance with AS 3959:2018 clauses 2.2.5 and C2.2.5.

Effective Slope Variation Due to Multiple Development Sites

When the effective slope, under a single area of bushfire prone vegetation, will vary significantly relative to multiple proposed development sites (exposed elements), then the effective slopes corresponding to each of the different

locations, are separately identified. The relevant (worst case) effective slope is determined in the direction corresponding to the potential directions of fire spread towards the subject building(s).

AS 3959:2018 EFFECTIVE SLOPE DETERMINATION - GUIDANCE

The Standard presents a broad set of guidance statements that indicate the intent of deriving an effective slope value for use in calculations, rather than detailing the 'in the field' determination process. These include:

- Highlighting the importance of the value by stating "The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the severity of the fire and the ultimate level of radiant heat flux" (Clause C2.2.5). [Note: A common rule of thumb is that for every 10 degrees of upslope, a fire will double its rate of spread if moving in the direction of the prevailing wind].
- It may be necessary to consider the slope under the classified vegetation for distances greater than 100 m in order to determine the effective slope for that vegetation classification.
- "Where there is more than one slope within the classified vegetation, each slope shall be individually assessed, and the worst case Bushfire Attack Level shall apply" (Clause 2.2.5).

NSW RFS 2019, PLANNING FOR BUSHFIRE PROTECTION - APPENDIX A1.5 - ADDITIONAL DETERMINATION GUIDANCE

- "In identifying the effective slope - it may be found that there are a variety of slopes covering different distances within the vegetation. The effective slope is considered to be the slope under the vegetation which will most significantly influence the bushfire behaviour for each aspect. This is usually the steepest slope. In situations where this is not the case, the proposed approach must be justified".
- "Vegetation located closest to an asset may not necessarily be located on the effective slope".

SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

The effective slopes determined from the site assessment are recorded in Table 3.2 of this Bushfire Management Plan.

A1.4: SEPARATION DISTANCE

Measuring

The separation distance is the distance in the horizontal plane between the receiver (building/structure or area of land being considered) and the edge of the classified vegetation (AS 3959:2018, clause 2.2.4)

The relevant parts of a building/structure from which the measurement is taken is the nearest part of an external wall or where a wall does not exist, the supporting posts or columns. Certain parts of buildings are excluded including eaves and roof overhangs.

The edge of the vegetation, for forests and woodlands, will be determined by the unmanaged understorey rather than either the canopy (drip line) or the trunk (AS 3959:2018, clause C2.2.5).

Measured Separation Distance as a Calculation Input

If a separation distance can be measured because the location of the building/structure relative to the edge of the relevant classified vegetation is known, this figure can be entered into the BAL calculation. The result is a determined BAL rating.

Assumed Separation Distance as a Calculation Input

When the building/structure location within the lot is not known, an assumed building location may be applied that would establish the closest positioning of the building/structure relative to the relevant area of vegetation.

The assumed location would be based on a factor that puts a restriction on a building location such as:

- An established setback from the boundary of a lot, such as a residential design code setback or a restrictive covenant; or
- Within an established building envelope.

The resultant BAL rating would be indicative and require later confirmation (via a Compliance Report) of the building/structure actual location relative to the vegetation to establish the determined BAL rating.

Separation Distance as a Calculation Output

With the necessary site specific assessment inputs and using the AS 3959:2018 bushfire modelling equations, the range of separation distances that will correspond to each BAL rating (each of which represents a range of radiant heat flux), can be calculated. This has application for bushfire planning scenarios such as:

- When the separation distance cannot be measured because the exact location of the exposed element (i.e., the building, structure or area), relative to classified vegetation, is yet to be determined.

  In this scenario, the required information is the identification of building locations onsite that will correspond to each BAL rating. That is, indicative BAL ratings can be derived for a variety of potential building/structure locations; or

- The separation distance is known for a given building, structure or area (and a determined BAL rating can be derived), but additional information is required regarding the exposure levels (to the transfer of radiant heat from a bushfire), of buildings or persons, that will exist at different points within the subject site.

The calculated range of separation distances corresponding to each BAL rating can be presented in a table and/or illustrated as a BAL Contour Map – whichever is determined to best fit the purpose of the assessment.

For additional information refer to the information boxes in Section 3 'Bushfire Attack Levels (BAL) - Understanding the Results and Section 3.2. 'Interpretation of the BAL Contour Map'.

SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

For the subject development/use the applicable separation distances values are derived from calculations applying the assessed site data. They are an output value, not an input value and therefore are not presented or justified in this appendix.

The derived values are presented in Section 3, Table 3.1 and illustrated as a BAL contour map in Figure 3.2.

APPENDIX B: ADVICE - ONSITE VEGETATION MANAGEMENT - THE APZ

THE ASSET PROTECTION ZONE (APZ) – DESCRIPTION AND OBJECTIVES

Description: The asset protection zone (APZ) is the area of land surrounding a building or structure on which any combustible materials will be located and/or managed to reduce the potential impact of the direct and indirect attack mechanisms (threats) of bushfire, and therefore reduce the associated risks of building/structure damage or loss, to acceptable levels.

When cultivated and/or natural vegetation exists within the zone it must present low potential threat levels from the direct fire attack mechanisms of flame contact, radiant heat and ember attack and fire driven wind, and the indirect attack mechanisms of debris accumulation, surface fire, tree strike and consequential fire.

The required low threat levels will be achieved as the result of factors that include persistent higher fuel moisture contents, lower flammability and/or minimal fuel loads, due to either limiting the existence of these fuels through removal and/or modification, and the subsequent ongoing management (reduction) of fuel loads.

When a bushfire attack level (BAL) is required to be determined for a building/structure to establish its bushfire construction requirements, the condition of the vegetation within the APZ must satisfy the requirements established by *clause 2.2.3.2 of AS 3959:2018 Construction of buildings in bushfire prone areas* - to be excluded from classification.

For other combustible structures/materials within the APZ, lower threat levels will be the result of factors such as their appropriate use, lowered vulnerability and location relative to the primary building/structure to be protected.

Objectives: The primary objectives of establishing a low threat area surrounding buildings/structures are to create that performs the following functions:

1. To establis an APZ of specified dimensions ensure the building is sufficiently separated from the identified bushfire hazard to limit the impact of its direct attack mechanisms. The required dimensions of the APZ must:
    - Remove the potential for direct flame contact on the building;
    - Reduce the level of radiant heat to which the building is exposed. The APZ dimensions should ensure that the potential level of radiant heat impact corresponds to the level of vulnerability of the building/structure - as determined by the degree to which bushfire resistant construction has been applied (or not). For example, when constructed to the requirements corresponding to its determined exposure to radiant heat (measured as a bushfire attack level) in accordance with AS 3959 or the NASH Standard.
    - Ensure some reduction in the threat level of the ember/burning debris attack mechanism when higher threat vegetation types are present in the vicinity. Note, the reduction in some scenarios will be minimal given the produced quantity, type, survival time and consequent distance that certain embers/burning debris can travel.

      Be aware of that research has identified that consequential fire, ignited by embers, is the primary cause (>80%) of building loss in past Australian bushfire events. In bushfire prone areas, the importance of applying protection measures to prevent ember entry to buildings/structures and minimising the existence of consequential fire fuels cannot be overstated.
2. To ensure any combustible fuels (debris and structures) or trees that remain within the APZ will be managed and located to limit the potential impact of the indirect attack mechanisms of bushfire by:
    - Minimising the accumulation of debris on, within and around buildings/structures to limit this source of fuel for consequential fires that will result in the direct fire attack mechanisms of flames and greater radiant heat existing closer to the buildings/structures, even though the bushfire hazard exists at a greater distance away;
    - To prevent surface fire moving through the APZ and closer to buildings/structures than the fire in the bushfire hazard itself can;

- Prevent fire weakened or windblown trees/branches impacting buildings/structures and allowing ember/burning debris entry;

- To ensure other combustible materials that can result in a consequential fire ignited by embers/burning debris), within both the APZ and parts of the building, are eliminated, minimised and/or appropriately located or protected (the explanatory notes in the Guidelines provide some guidance for achieving this objective and other sources are available); and

3. To provide a defendable space for firefighting activities.

B1: Asset Protection Zone (APZ) Dimensions

APZ DIMENSIONS – DIFFERENCES IN REQUIREMENTS FOR PLANNING ASSESSMENTS COMPARED TO IMPLEMENTATION

THE 'PLANNING BAL-29' APZ DIMENSIONS

The 'Planning BAL-29' APZ is not necessarily the size of the APZ that must be physically implemented and maintained by a landowner. Rather, its purpose is to identify if an acceptable solution for planning approval can be met i.e., can a specified minimum separation distance from bushfire prone vegetation exist.

An assessment against the Bushfire Protection Criteria is conducted for planning approval purposes. To satisfy 'A2.1: Asset Protection Zone', it must be demonstrated that certain minimum separation distances between the relevant building/structure and different classes of bushfire prone vegetation, either exist or can be created and will remain in perpetuity. These minimum separation distances determine the 'Planning BAL-29' APZ dimensions.

Dimensions: The minimum dimensions are those that will ensure the potential radiant heat impact on subject buildings does not exceed 29 kW/m^2. These dimensions will vary dependent on the vegetation classification, the slope of the land they are growing on and certain other factors specific to the subject site.

Note: For certain purposes associated with vulnerable land uses, the 'Planning BAL-29' APZ may be replaced with dimensions corresponding to radiant heat impact levels of 10 kW/m^2 and 2 kW/m^2 and calculated using 1200K flame temperature.

Location: The identified 'Planning BAL-29' APZ must not extend past lot boundaries onto land the landowner has no control over either now or potentially at some point in the future. Limited exceptions include:

- When adjoining land is not vegetated (e.g., built out, roads, carparks, drainage, rock, water body etc.);
- When adjoining land currently or, will in the short term, contain low threat vegetation and or vegetation managed in a minimal fuel condition as per AS 3959:2018 cl. 2.2.3.2. It must be reasonable (justifiable) to expect this low threat vegetation and/or level of management will continue to exist or be conducted in perpetuity and require no action from the owner of the subject lot.

  Such areas of land include formally managed areas of vegetation (e.g., public open space / recreation areas / services installed in a common section of land). For specific scenarios, evidence of the formal commitment to manage these areas to a certain standard may be required and would be included in the BMP.

  These areas of land can also be part of the required APZ on a neighbouring lot for which the owner of that lot has a recognised responsibility to establish and maintain; and
- When there is a formalised and enforceable capability and responsibility created for the subject lot owner, or any other third party, to manage vegetation on land they do not own in perpetuity. This would be rare, and evidence of the formal authority would be included in the BMP.

The bushfire consultant's 'Supporting Assessment Detail', that is presented in the assessment against the acceptable solution A2.1, will identify and justify how any adjoining land within the 'Planning BAL-29 APZ will meet the APZ standards. Or otherwise, explain how this condition cannot be met.

THE 'BAL RATING' APZ DIMENSIONS

The applicable BAL rating will have been stated in the BAL Assessment Data section of the BAL Assessment Report or BMP (as relevant). The BAL rating can be assessed as 'determined' or 'indicative' or be 'conditional', dependent of the specific conditions associated with the site and the stage of assessment or planning. It is the eventual assessment of the 'Determined' BAL that will establish both the BAL rating that is to apply and its corresponding 'BAL Rating' APZ dimensions.

Dimensions: The minimum dimensions of the 'BAL Rating' APZ to be established and maintained will be those that correspond to the determined BAL rating for the subject building/structure that has accounted for surrounding vegetation types, the slope of the land they are growing on and certain other factors specific to the subject site and surrounding land.

Establishing the 'BAL Rating' APZ will ensure that the potential radiant heat exposure of the building/structure will be limited to the level that the applied construction requirements are designed to resist when that building/structure is required to be constructed to the standard corresponding to the Determined BAL.

> *Note: For certain purposes associated with vulnerable land uses, the 'BAL Rating' APZ dimensions may be replaced with dimensions corresponding to the specific radiant heat impact levels of 10 kW/m^2 and 2 kW/m^2 and calculated using 1200K flame temperature.*

Location: The same conditions will apply as for the 'Planning BAL-29' APZ.

THE 'LOCAL GOVERNMENT' APZ DIMENSIONS

Some Local Government's establish the dimensions of the APZ that must be established surrounding buildings in their annual Firebreak/Hazard Reduction Notice. Or for a specific site they may establish a maximum allowable dimension (typically that corresponding to BAL-29). When established, the landowner will need to be comply with these.

THE 'REQUIRED' APZ DIMENSIONS

This is the APZ that is to be established and maintained by the landowner within the subject lot and surrounding the subject building(s). It will be identified on the Property Bushfire Management Statement when it is required to be included in this Report/Plan.

Dimensions: The 'Required APZ' dimensions are the minimum (or maximum when relevant) distances away from the subject building(s) that the APZ must extend. These distances will not necessarily be the same all around the building(s). They can vary and are dependent on the different vegetation types (and their associated ground slope) that can exist around the building(s), and specific local government requirements. The dimensions to implement are determined by:

A. The 'BAL Rating APZ' of the subject building(s) when distances are greater than 'B' below (except when 'B' establishes a maximum distance); or

B. The 'Local Government' APZ' derived from the Firebreak/Hazard Reduction Notice when distances are greater than 'A' above, other than when a maximum distance is established, in which case this will apply; or

C. A combination of 'A' and 'B'.

Location: The same conditions will apply as for the 'Planning BAL-29' APZ.

B1.1: THE APZ DIMENSIONS REQUIRED TO BE IMPLEMENTED BY THE LANDOWNER

DETERMINATION OF THE 'REQUIRED' APZ DIMENSIONS TO BE IMPLEMENTED AND MAINTAINED BY LANDOWNER WITHIN THEIR LOT											
Relevant Buildings(s)	Vegetation Classification [Refer to Fig 3.1]		Minimum Required Separation Distances from Building to Vegetation (metres)								
			Established by the 'BAL Rating' APZ Dimension						Established by the "Local Government' APZ Dimension		The 'Required' APZ Dimensions [see note]
			Determined Radiant Heat Impact		Stated 'Indicative' or 'Conditional' BAL				Firebreak / Hazard Reduction Notice	Maximum Allowed	
	Area	Class			BAL-29	BAL-19	BAL-12.5	BAL-LOW			
Buildings, feedstock stockpiles, composting windrows, and final product	1	(D) Scrub			13	19	27	100	20		13
	2	(D) Scrub			15	22	31	100	20		15
	3	(A) Forest			21	31	42	100	20		21
	4	(A) Forest			27	37	50	100	20		27
	5	(B) Woodland			14	20	29	100	20		14
	6	Excluded cl 2.2.3.2(e)			N/A	N/A	N/A	N/A	20		N/A

Note: The 'Required' APZ Dimension corresponding to each area of vegetation is the greater of the 'BAL Rating' or the 'Firebreak/Hazard Reduction Notice' APZ dimensions - unless a local government maximum distance(s) is established as a result of their environmental assessment of the subject site. The area of the APZ will also be limited to the subject lot boundary unless otherwise justified in this Report/Plan. Final determination of the dimensions will require that any indicative or conditional BAL becomes a 'Determined' BAL.

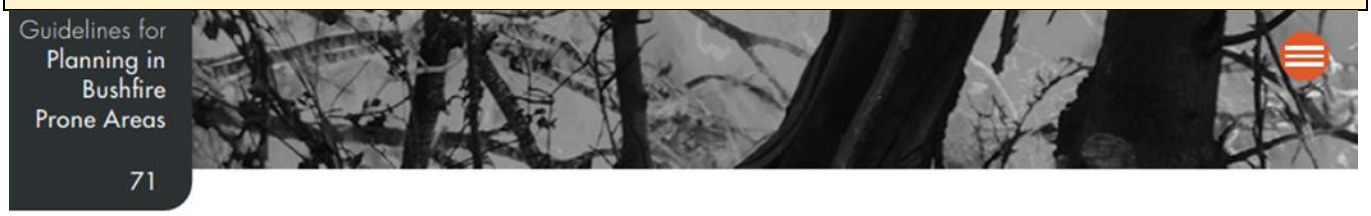
Comments: Refer to Figure 1.1 – While structures, inclusive of a Site Office and associated Ablutions are mobile, Bushfire Prone Planning recommends they be sited in the developable portion of the subject land and be surrounded by a Planning BAL-29 APZ so as to ensure the potential radiant heat impact of a bushfire does not exceed 29kWm^2.

The Shire of Gingin Firebreak Order APZ Dimension may be applicable to feedstock, composting windrows, and final product. This is to be confirmed with the Shire of Gingin.

B2: The Standards for the APZ as Established by the Guidelines (DPLH, v1.4)

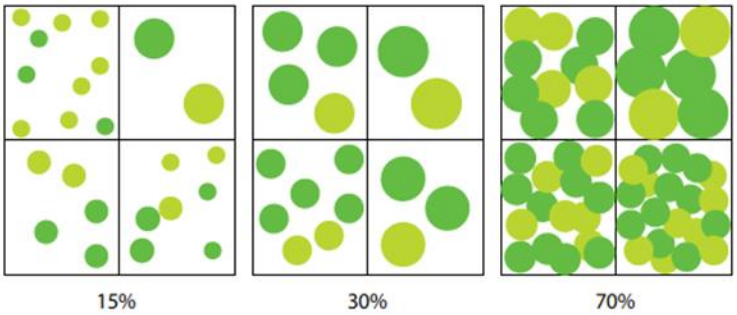
Within the Guidelines (source: https://www.wa.gov.au/government/document-collections/state-planning-policy-37-planning-bushfire-prone-areas), the management Standards are established by:

- Schedule 1: Standards for Asset Protection Zones (see extract below) established by the Guidelines; and
- The associated explanatory notes (Guidelines E2) that address (a) managing an asset protection zone (APZ) to a low threat state (b) landscaping and design of an asset protection zone and (c) plant flammability.



ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. **Figure 19:** Tree canopy cover – ranging from 15 to 70 per cent at maturity 

Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
Grass	• Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	• Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

B3: The Standards for the APZ as Established by the Local Government

Refer to the firebreak / hazard reduction notice issued annually (under s33 of the Bushfires Act 1954) by the relevant local government. It may state Standards that vary from those established by the Guidelines and that have been endorsed by the WAPC and DFES as per Section 4.5.3 of the Guidelines.

A copy of the applicable notice is not included here as they are subject to being reviewed and modified prior to issuing each year. Refer to ratepayers notices and/or the local government's website for the current version.

B4: Vegetation and Areas Excluded from Classification - Ensure Continued Exclusion

AS 3959:2018 establishes the methodology for determining a bushfire attack level (BAL). The methodology includes the classification of the subject site's surrounding vegetation according to their 'type' and the application of the corresponding relevant bushfire behaviour models to determine the BAL.

Certain vegetation can be considered as low threat or managed in a minimal fuel condition and can be excluded from classification. Where this has occurred in assessing the site, the extract from AS3959:2018 below states the requirements that must continue to exist for the vegetation on those areas of land to be excluded from classification (including the size of the vegetation area if relevant to the assessment).

2.2.3.2 *Exclusions—Low threat vegetation and non-vegetated areas*

The following vegetation shall be excluded from a BAL assessment:

(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 vegetation.

(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 vegetation.

(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 vegetation.

(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 windbreaks.

NOTES:

1 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm).

2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.

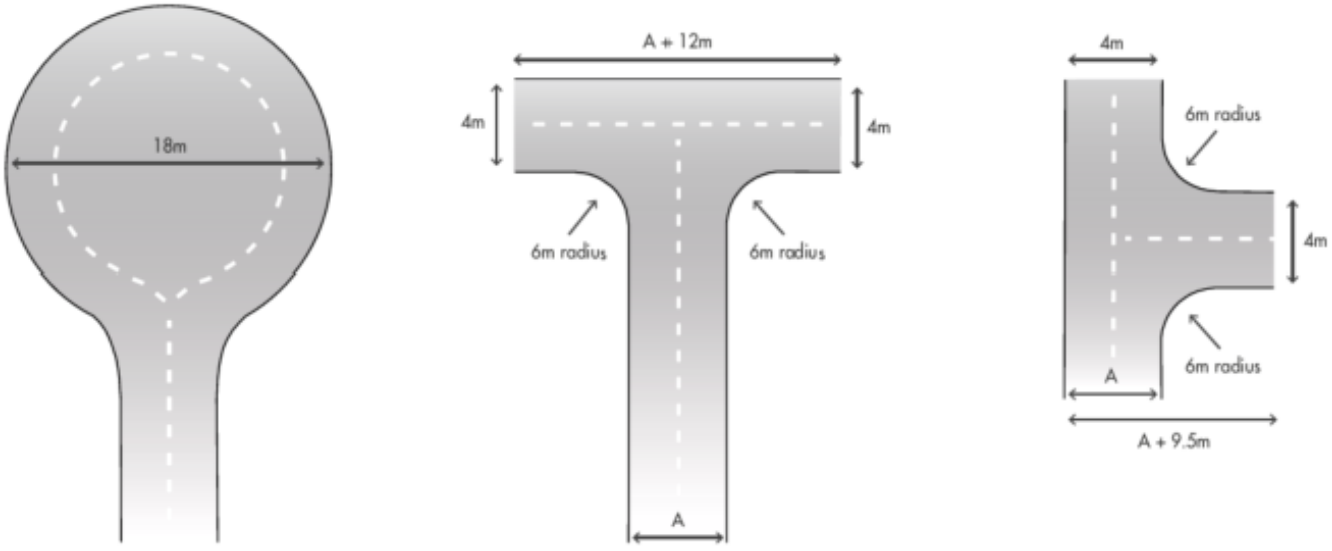
APPENDIX C: TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

The design/layout requirements for access are established by the acceptable solutions of the Guidelines (DPLH, 2021 v1.4) Element 3 and vary dependent on the access component, the land use and the presence of 'vulnerable' persons. Consequently, the best reference source are the Guidelines. The technical requirements that are fixed for all components and uses are presented in this appendix.

GUIDELINES TABLE 6, EXPLANATORY NOTES E3.3 & E3.6 AND RELEVANT ACCEPTABLE SOLUTIONS

Technical Component	Vehicular Access Types / Components			
	Public Roads	Emergency Access Way [1]	Fire Service Access Route [1]	Battle-axe and Private Driveways [2]
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum Horizontal clearance (m)	N/A	6	6	6
Minimum Vertical clearance (m)	4.5			
Minimum weight capacity (t)	15			
Maximum Grade Unsealed Road [3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum Grade Sealed Road [3]		1:7 (14.3%)		
Maximum Average Grade Sealed Road		1:10 (10%)		
Minimum Inner Radius of Road Curves (m)		8.5		

Turnaround Area Dimensions for No-through Road, Battle-axe Legs and Private Driveways [4]



Passing Bay Requirements for Battle-axe leg and Private Driveway

When the access component length is greater than the stated maximum, passing bays are required every 200m with a minimum length of 20m and a minimum additional trafficable width of 2m (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum 6m).

Emergency Access Way – Additional Requirements

Provide a through connection to a public road, be no more than 500m in length, must be signposted and if gated, gates must be open the whole trafficable width and remain unlocked.

[1] To have crossfalls between 3 and 6%.

[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

[3] Dips must have no more than a 1 in 8 (12.5% or 7.1 degree) entry and exit angle.

[4] The turnaround area should be within 30m of the main habitable building.

D2: Non-Reticulated Areas – Static Supply

For specified requirements, refer to the Guidelines Element 4: Water – Acceptable Solution A4.2 , Explanatory Notes E4 (that provide water supply establishment detail under the headings of water supply; independent water and power supply; strategic water supplies, alternative water sources and location of water tanks) and the technical requirements established by Schedule 2 (reproduced below).

SCHEDULE 2: WATER SUPPLY DEDICATED FOR BUSHFIRE FIREFIGHTING PURPOSES

2.1 Water supply requirements

Water dedicated for firefighting should be provided in accordance with Table 7 below, and be in addition to water required for drinking purposes.

Table 7: Water supply dedicated for bushfire firefighting purposes

PLANNING APPLICATION	NON-RETICULATED AREAS
Development application	10,000L per habitable building
Structure Plan / Subdivision: Creation of 1 additional lot	10,000L per lot
Structure Plan / Subdivision: Creation of 3 to 24 lots	10,000L tank per lot **or** 50,000L strategic water tank
Structure Plan / Subdivision: Creation of 25 lots or more	50,000L per 25 lots or part thereof Provided as a strategic water tank(s) or 10,000L tank per lot

2.2 Technical requirements

2.2.1 Construction and design

An above-ground tank and associated stand should be constructed of non-combustible material. The tank may need to comply with AS/NZS 3500.1:2018.

Below ground tanks should have a 200mm diameter access hole to allow tankers or emergency service vehicles to refill direct from the tank, with the outlet location clearly marked at the surface. The tank may need to comply with AS/NZS 3500.1:2018. An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. If the tank is required under the BCA as part of fire hydrant installation, then the tank will also need to comply with AS 2419.

Where an outlet for an emergency service vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply.

2.2.2 Pipes and fittings

All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire attack and be in accordance with the applicable section below, unless otherwise specified by the local government.

2.2.2.1 Fittings for above-ground water tanks:

- Commercial land uses: 125mm Storz fitting; or
- Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or
- Standalone water tanks: 50mm male camlock coupling with full flow valve; or
- Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires.

2.2.2.2 Remote outlets

In certain circumstances, it may be beneficial to have the outlet located away from the water supply. In such instances in which a remote outlet is to be used, the applicant should consult the local government and DFES on their proposal.

EXAMPLE CONSTRUCTION AND FITTINGS	
	
Strategic 47,000 Litre Concrete Tank & Protected Fittings	
	
10,000 Litre Concrete Tank	Storz and Camlock Couplings
	
Full Flow 50mm Ball Valve	Full Flow 50mm Gate Valve and Male Camlock

ADDENDUM:

- **Fire Management Plan: Lot 7779 on Deposited Plan 209806 Wannamal Road Cullalla (Prepared by Bioscience – May 2020)**
- **GL-06: Acceptable Sources of Water Supply for Fire Hydrant/Sprinkler Systems. (Bores, Dams, Rivers, Lakes and Seawater).**

Bioscience

Integrating Resource Management

Fire Management Plan:
Lot 7779 on Deposited Plan 209806
Wannamal Road, Cullalla

Wannamal Road Organics Pty Ltd
Western Australia
May 2020

FIRE MANAGEMENT
Lot 7779 Wannamal Rd Cullalla

Prepared by
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Document Control

Issue	Date	Author	Reviewer	Approved
1	28/05/2020	P. Keating	D. Alanoix	P. Keating

Contents

1 Objective

The purpose of this plan is to document how operations at Wannamal Rd Organics will be undertaken to achieve complete compliance with the recommendation of DFES in their September 2014 Information Note Bulk Green Waste Storage Fires.

2 Fire Risk Identification

2.1 Area Risk

The Wannamal Rd site is surrounded by natural bushland vegetation to the north, south and west. As such, bushfires represent a substantial seasonal threat. Further, outside the normal summer bushfire season, there is a risk of lightning strike from passing storms producing fires. Finally, as the site is relatively remote, there is some risk of arson.

2.2 Site Activity Risk

DFES advice, consistent with the experiences of compost operators in the Perth area, states that special fire risks are associated with composting operations. This is due to microbial activity within organic waste which produces exothermic reactions, and heat can build up in stockpiles and windrows to the point where there is spontaneous combustion.

They point out that conditions of spontaneous combustion arise when the amount of heat generated within a pile of organic material is greater than the amount of heat lost to the surrounding environment. Such conditions arise when green waste is moist, but not wet, and when storage pile dimensions are too large creating a low surface area to volume ratio. Dense piles created from combinations of coarse and fine material compact when piles are too high.

3 Fire Risk Management

3.1 Fire Fighting Equipment

The site will maintain in good order two large water tankers, equipped with high volume discharge pumps. The major tanker with be a conventional 20,000 L "Dinosaur" water cart. It will have multiple uses, including:

1) Dust control of surfaces during construction and operations, using rear discharge sprays,
2) Windrow water application using a side discharge spray and
3) Firefighting using a top mounted fire-fighting nozzle.

The second tanker will also have 20,000 L capacity and a high- volume discharge pump. It will be trailer mounted and only used for fire-fighting. If needed it will be coupled to a front-end loader and towed to the fire.

3.2 Water Storage

Both water tankers will be gravity filled from 2 overhead 30,000 L tanks which will be maintained full, either from the onsite bore, or from the leachate/stormwater holding dam constructed at the center of the compost pad (Figure 1).

4 Fire Risk Minimisation

4.1 Bushfires

The composting site will be on a hardstand surrounded by a 1.8 m security fence (Figure 1).

The hard stand area will be kept free of flammable debris. A fire break will be installed and maintained to 3 m width outside the perimeter fence. Existing firebreaks currently installed at the property boundaries will be maintained in condition to enable access to bushfires by DFES and local volunteer firefighting group appliances.

4.2 Composting Operations

DFES guidance teaches the risk of fires in greenwaste are greatest when material moisture content is between 20 to 45% water on a weight/weight basis, and where stockpiles of materials are sufficiently large that surface area to mass ratios are low.

The risk of fires by spontaneous combustion are substantially lowered by maintaining moisture above 45%. Where green waste materials are stored prior to grinding, chipping, they should be in a dry state (less than 20% water) with pile dimensions maximally:

- Length 50 m
- Width 10 m
- Height 5 m

Further, adequate separation distances between potentially combustible material piles should be separated by:

- 24 m separation between each 50 m length window.
- 41 m separation width between adjacent windrows.

4.3 Operational parameters

It is anticipated that materials will be received in one of two possible conditions, being materials that have been ground or chipped to an adequate size suitable for composting, or oversize materials requiring grinding or chipping.

Materials that are suitable for composting will be laid out in windrows and soon as practicable. and immediately have water added to 55% w/w.

Oversize material requiring grinding or chipping will not have water added to them, but rather will be set aside in piles of stored green waste with the above maximum dimensions until these

is sufficient volume to warrant contacted operators to come to the site to undertake grinding and chipping operations. Such piles should be kept as open as possible to allow air circulation.

4.4 Daily composting operations

At the beginning of the business day, staff will routinely measure the temperate and moisture content of each operating windrow at least once per 10 linear meters of windrow. Data will be recorded on a field sheet and considered by the operations manager to set the priority task operations schedule for the day. The first priority will be to add water to windrows found to be less that 45%. The second priority will be to use front end loaders to shift piles that are above 55 degrees, to thereby aerate and cool windrows to optimal composting temperature. Each batch windrow a have daily temperature and moisture recorded, and such records will note when water is added and when the pile is turned.

It is anticipated that as composting proceeds, windrow size will shrink. Accordingly three adjacent windows will be combined into two windrows. When windrow temperatures drop below 35 degrees for two consecutive days, the composting process will be deemed to have been completed. That windrow will be carried by front end loaders to the finished compost storage area.

Greenwaste storage windrows should likewise have temperature and moisture content. measured and recorded daily. If the temperature is greater than 45 degrees, the pile should not be watered, but should be aerated using a front-end loader.

Stored, finished compost piles will have temperatures measured and recorded weekly. If temperature rise to greater than 40 degrees they will be aerated with a front end loader.

During extremely hot weather events, pile temperatures will be measured and recorded in mid-afternoon as well as first thing in the morning.

4.5 Avoidance of External Fire Source

No smoking will be allowed on the composting pad. No equipment likely to cause sparks (welding equipment or angle grinders) will be used within the composting pad area.

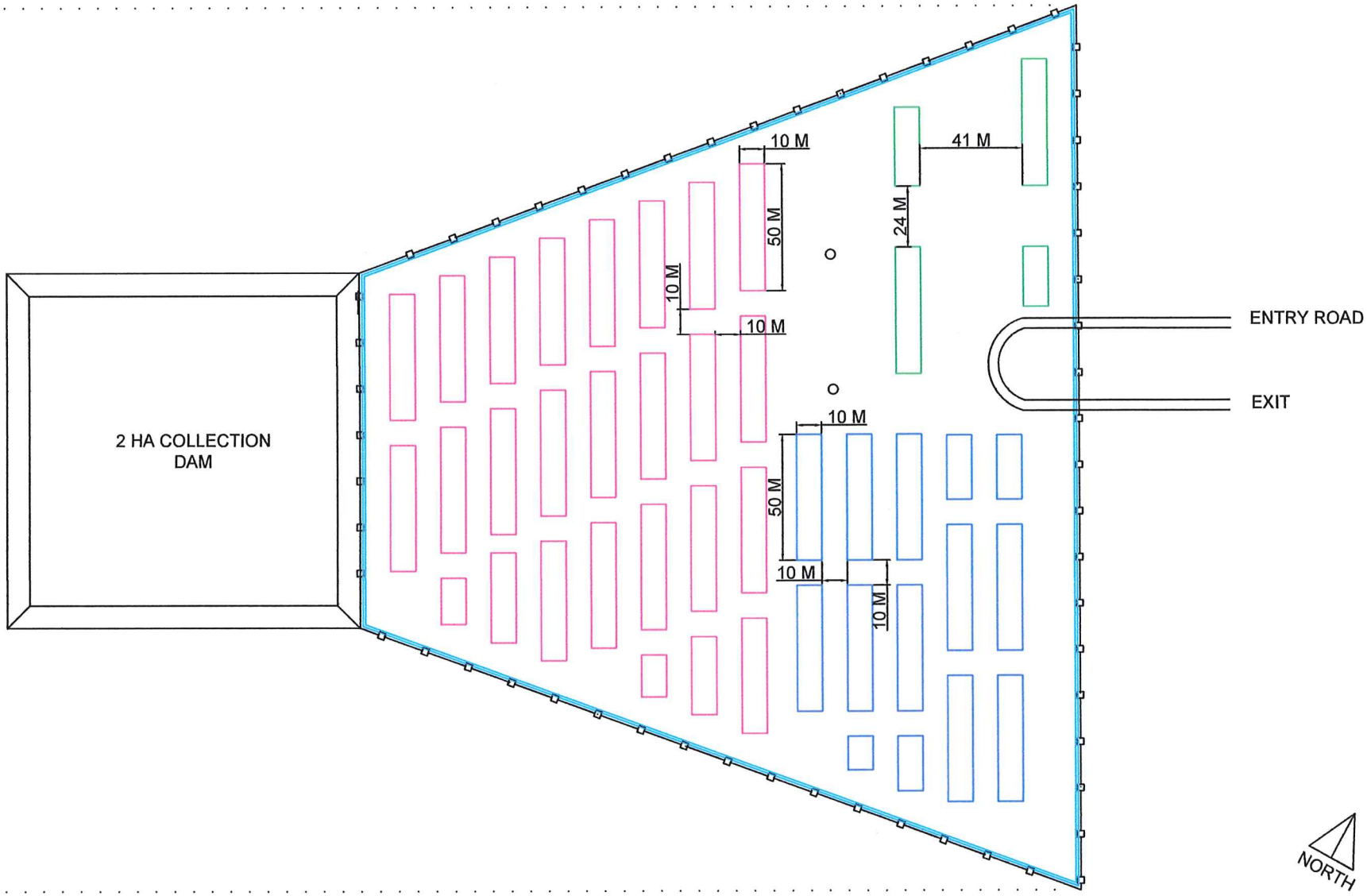
5 Fire Outbreak Response

Any fire outbreak within the composting facility will be responded to immediately by all available staff.

Both water carts will be mobilized to direct water at high volume/low pressure at the core of the fire. An excavator will be used to separate the non- burning material from the burning material. Burning materials will be spread out on the compost pad and saturated with water.

Operators will remain in attendance until the fire is completely out. A front end loader will pick up the burned material to verify it is completely extinguished.

Once the fire is out, investigations will be undertaken to determine the cause such that this Fire Management Plant will be reviewed and revised as necessary by the operations manager and directors. A report of the fire will be prepared for the Shire of Gingin and DFES.



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Rev.	Date	Rev.	Drawn by	Approved
A	28/05/2020	FOR COMMENT	DA	PK

STOCKPILE LAYOUT WITHIN RECEIVAL AND SORTING AREA
STOCKPILE LAYOUT WITHIN COMPOSTING AREA
FINAL PRODUCT LAYOUT WITHIN STORAGE AREA
200 MM BUND MADE OF ASPHALT
1.8 M PERIMETER FENCE
30,000 L TANK

CLIENT: WANNAMAL RD ORGANICS

FIGURE 1: PROPOSED STOCKPILE LAYOUT WITHIN STAGE 1

DATE: 28 / 05 /2020

DWG NO.: BIO20200528_001

REV.: A

Revised: 2017
Valid: 2019
Authorised: Manager Built Environment Branch

GL-06: ACCEPTABLE SOURCES OF WATER SUPPLY FOR FIRE HYDRANT/SPRINKLER SYSTEMS. (BORES, DAMS, RIVERS, LAKES AND SEAWATER)

PURPOSE:

To highlight the important issues, related to acceptable sources of water supply for fire hydrant and fire sprinkler systems and to provide guidance when submitting building plan applications to the DFES for assessment.

INTRODUCTION:

Information is contained in AS 2419 Section 4 – Water Supplies, AS 2941 and AS 2118 regarding the use of acceptable water supplies suitable for firefighting purposes, however this guideline will provide additional assistance when preparing proposals for consideration by DFES. This document is a guide and shall not be used to create precedent for future projects. Notwithstanding this, **each project will be assessed on a case-by-case basis.**

COMMENT:

The information contained in AS 2419 relating to the acceptability of certain water supplies must be supported by documentation that demonstrates a level of reliability that can be compared with that of a service provided by a water supply agency. Reference to a Hydrogeology Report is a recognised means of demonstrating an appropriate level of water supply reliability.

1. QUALITY OF WATER

If the water contains dissolved or suspended matter likely to cause accumulation, pump materials shall be selected with due regard to the quality of water.

Where the water supply is obtained from an open source such as a river, pond or wet pit, a compatible, corrosion-resistant strainer shall be attached to the suction inlet and shall have a free area **not less than four times the area of the suction entry**.

Individual openings in the strainer shall be not greater than the pump impeller passage width, up to a maximum allowance of 8 mm by 8 mm.

Firefighting water may not to be required to be potable under the standards, but it must be of suitable use now and in the future.

Confirmation that the water is free from corrosive, bacterial or other contaminants that may affect the operation of the pump, cause health issues in the future for firefighter or compromise the effective firefighting capabilities of the brigade. Items to consider but not limited to.

- ***pH*** (***potential of hydrogen***) both acidity and basicity.
- ***Iron Bacteria*** *contamination*
- **Biofouling** the accumulation of microorganisms, plants, algae, or animals on wetted surfaces.
- **Biofilm** an accumulation of by products that can reduce the efficiency of pumps.
- **Effluent** both animal and human**.**
- **Enterococci** although not harmful themselves, they can indicate a possible presence of harmful microorganisms such as bacteria, viruses and protozoa.
- **Escherichia Coli** or E. Coli for short infection causing bacteria
- **Amoebae** wide range of single celled animal which may cause infection
- **Surface litter** both natural and man made

Biofouling

Biofilm

Iron Bacteria

2. BORES - Reliability of Supply

Bores are no longer considered acceptable **primary** water supplies for fixed fire protection installation pumpset systems and should not be used.

Bores must be approved by the Local Government before they are installed.

Hydrogeology Report

A hydrogeology report shall be submitted by the Building Surveyor and contain sufficient detail for DFES to assess a proposed or existing bore as a source of water for firefighting purposes. The following information must be included in the report:

- **Capacity** – Verification of the amount of water available from the bore.
    - ◊ The water supply shall be capable of supplying the maximum flow requirements

for the duration required by AS 2419 or AS 2118. This capacity must be available all year round.

- **Neighbouring Bores** - Neighbouring bores can interfere with the water level of the proposed bore.

  ◊ Ensure that the submitted hydrogeology report identifies any potential problem(s) from neighbouring bores.

Pumps

- Pumping to tanks - bore pump do not provide direct firefighting flow and pressure and are only intended to fill water storage tanks to the **full** capacity,

  ◊ The full capacity for fire hydrant systems is a minimum of 4 hours and for fire sprinklers as nominated within AS 2118 in accordance with the relevant sprinkler system hazard classification.

  ◊ Pumps downstream of the fire tank which provide firefighting pressures and flows shall comply fully with the requirements of AS 2419, AS 2118 and AS 2941.

  ◊ A bore is not considered to be a reticulated water supply; therefore, a duty and stand-by pump must be provided as per Clause 6.2 of AS 2419.1 (or as amended).

  (DFES interpretation of a reticulated water supply is a water supply from the Water Corporation (or other water utility) main, either connected directly to the hydrant installation or to a water tank(s) that will provide the required flow at a minimum 200kPa.)

  ◊ When used in conjunction with a sprinkler system, the number of pumps required will depend on the grade of water supply in accordance with BCA Specification E1.5 and AS 2118.1, Section 4 – Water supplies.

  ◊ ALL pumps referred to above, shall be maintained in accordance with the requirements of AS 1851 (or as amended).

  ◊ Refer to AS 2941 - Section 2 Water Supplies and Appendix B for additional requirements.

SUMMARY REQUIREMENTS (for BORES):

1. *The reliability of bore water must consider the capacity of the bore, water quality and the effects of neighbouring bores. These aspects must be addressed by submission of a hydrogeology report.*

   Note: Suitable connections and vehicle hardstand shall be provided in accordance with Guideline 11, AS2419 and DFES requirements.

3. *Power supply to the pumps must be proven to be reliable and all pumps must be maintained to AS1851.*

3. PRIVATE DAMS

Hydrogeology Report

A hydrogeology report shall be submitted by the building Certifier and contain sufficient detail for DFES to make an assessment of the proposed or existing dam as a source of water for firefighting purposes.

The following information must be included in the report.

- The water storage capacity of the dam (including the lowest mean level from a 25 year history)
- Likely rainfall and run-off.
- Other sources of infill (if any)
- Any domestic or commercial use throughout the year (if applicable)
- The minimum water supply capacity available for firefighting purposes.
- Estimated evaporation from the dam.
- Water quality
- Details of dam construction
- Water and Rivers Commission Licensing (when applicable)
- All dams to comply with the Australian Engineering standards for 'Small Earth Wall Dams' (when applicable)

Note: The water storage and run-off area must be on the building lot under consideration and under the direct control of the building owner.

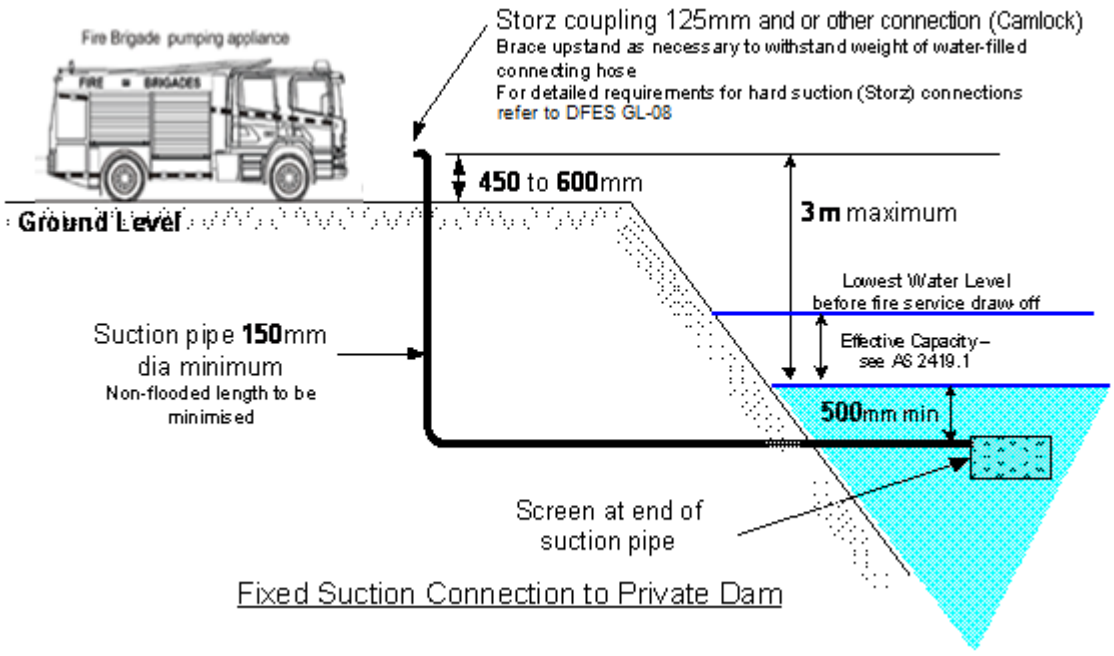
Hard Standing

- Hard standing must be provided to the summer low water line so that DFES appliances can draft water from the dam. It may be necessary to provide a suction pit or other means of ensuring that the inlet to the pump does not become fouled.

- The hard standing must be as defined in AS 2419 and DFES Guideline 11 Site Planning and Fire Application Specifications

- A fixed suction point can be installed where it is not possible to provide hard standing to the water's edge. A pipe (as depicted in the diagram below) can be installed with a strainer attached to the submerged end of the pipe, and a Storz coupling 125mm and two 100mm male Camlock connection above ground. However the maximum practical vertical lift must not exceed 3m.

- Refer to DFES Built Environment Branch, Guideline 8 Hard Suction Connection.



Fire Pumps

- Because a static water supply is not considered to be a reticulated water supply, two fire pumps will be required and must comply with the requirements of BCA part E1.3 and AS 2419.1 and AS 2941.

RIVERS, LAKES AND SEAWATER

Generally the same provisions required for 'private dams' also apply to rivers, lakes and seawater however, the following additional guidelines apply:

- Where it is proposed to use rivers, lakes or seawater, there will be a requirement for the Building surveyor or consultant to contact the Department of Water and/or any other Department with regulatory powers over the body of water to be used, for approval as well as forwarding a **hydrogeology report** similar to the requirements for the use of private dams or bore.

- The law relating to the right to surface water is contained in the "Rights to Water and Irrigation Act 1914 (RIWI Act)", administered by the Department of Water. The RIWI Act defines 'Riparian Rights' for those landholders where there is a water course flowing through their property or the property abuts the water-course. In this situation the landholder has the right to take water for specific non-commercial purposes. Taking water in excess of Riparian Rights or for commercial use may require a license. The RIWI Act doesn't specify the amount that can be taken as a Riparian Right, only the purpose for which it can be used.

  (Department of Water – Western Australia. Rights to Water and Irrigation Act 1914. Available www.water.wa.gov.au)

- As for private dams, consideration needs to be given to the domestic and or commercial connection from the water source. Unlike dams, which are usually singularly owned, rivers and lakes may have a number of unrelated users of the water supply.
- A four-hour supply of water dedicated to firefighting must be available all year round for a hydrant service designed in accordance with AS2419 or if a combined system is proposed, a capacity in accordance with the requirements of AS 2118 for sprinklers, whichever is the greater.

- **Galvanic corrosion and electrolysis can be a major problem in firefighting systems using saltwater.**

- The use of seawater for firefighting will require fixtures, fittings and pump components that will not be adversely affected by corrosion through saltwater. Possibly high quality, stainless steel fittings should be used.

- The storage of seawater is not recommended as over time with the temperatures experienced in Western Australia, the seawater decomposes and the salinity increases.

- Seawater may also contain microscopic organisms that grow or multiple over time.

System designers and consultants are advised to liaise with DFES to ascertain any specific Fire Service requirements when considering the use of sea water for firefighting.

DFES will assess these proposals on a case by case basis and may not support if any other water source is available.

SUMMARY REQUIREMENTS for DAMS, RIVERS, LAKES and SEAWATER

1. A hydrogeology report is to be submitted addressing the reliability of water supplies.
2. Dams, rivers, lakes and seawater are not considered a 'reticulated water supply' therefore a fire hydrant installation will require two pumps installed to the requirements of AS 2419.1 and AS 2941.
3. Provision must be made for hard standing suitable for DFES pumping appliances to access the water supply.
4. Department of Water and/or other regulatory departments, approval must be obtained for using RIVERS or LAKES.
5. Use of seawater will require the use of fittings and pump components considered suitable to avoid corrosion of the firefighting system. Possibly stainless steel.
6. The build of silt and debris in Dams, Rivers, Lakes and the Ocean needs to be considered as to not foul the suction inlet strainer or suction intake pipework.
7. The buildup of surface litter both natural and manmade needs to be considered as to not foul the suction inlet strainer or suction intake pipework.
8. The facility to allow attending fire brigades to flush their equipment with fresh potable water.

REFERENCES:

Australian Standard 2118.1	- Automatic Fire Sprinkler Systems
Australian Standard 2419.1	- Fire hydrant installations
Australian Standard 2941	- Fixed fire protection installations - Pump set systems
Building Code of Australia	- National Construction Code (BCA) Volume 1
Department of Environment & Conservation (WA)	- Minimum Construction Requirements for - Water Bores in Australia
Department of Health	- Bore Water
Department of Water (WA)	- Rights to Water and Irrigation Act 1914
Department of Transport	- Marine and Harbours Act
Department	

APPLICABLE LEGISLATION:

Building Act 2011

Building Regulations 2012 (as amended)

***Please note**: This is a controlled document. DFES guidelines are available on the DFES Website: www.dfes.wa.gov.au under Regulation and Compliance, Building Plan Assessment then click on Publications/Guidelines.*

Should the information provided in this guideline require further clarification, please contact DFES Built Environment Branch via email bebadmin@dfes.wa.gov.au

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