



Smith Bushfire Consultants Pty Ltd

BUSHFIRE MANAGEMENT PLAN

**Lot 2 and 3 Anketell Road, Anketell,
Anketell**

City of Kwinana



**Prepared by Ralph Smith
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Site visited 21 December 2020 and 22 April 2021; Report completed 6 May 2021

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lots 2 and 3 Anketell Road, Anketell

Site visit: Yes ☒ No ☐

Date of site visit (if applicable): Day 22 Month April Year 2021

Report author: Ralph Smith

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: 27541 Accreditation expiry: Month August Year 2021

Bushfire management plan version number: 1.2

Bushfire management plan date: Day 6 Month May Year 2021

Client/business name: Terranovis Pty Ltd

	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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Is the proposal any of the following (see [SPP 3.7 for definitions](#))?

	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minor development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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 development contains a service station.

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

Signature of report author



Date 6 May 2021

NOTE

This Bushfire Management Plan has been developed by Smith Bushfire Consultants Pty Ltd for the exclusive use of the client, Terranovis Pty Ltd, and their agents.

The plan has been compiled using the standard methodologies required by Western Australian government departments and agencies. It is based on the following:

- *State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7)*, December 2015
- *Guidelines for Planning in Bushfire Prone Areas*, December 2017
- *Australian Standard 3959 – Construction of buildings in bushfire-prone areas (Incorporating Amendments Nos 1 and 2)*, November 2018
- Standard fuel load field data collection methods and conversion to a fuel load applicable for the appropriate fire spread models.

The techniques described in the above publications have been applied in the appropriate areas and circumstances for the development of this document.

Where there was no public access the interpretation is based on photographic and satellite imagery, and a laser distance meter was used to measure distances and effective slope.

It is recommended that this Bushfire Management Plan be revised every five years to ensure that it remains relevant and in-line with current requirements. This will optimise protection. It is proposed that the property owners undertake the review.

DISCLAIMER

This Bushfire Management Plan has been prepared in good faith. It is derived from sources believed to be reliable and accurate at the time of publication. Nevertheless, this plan is distributed on the terms and understanding that the author is not responsible for results of any actions taken based on information in this publication or for any error or omission from this publication.

Smith Bushfire Consultants Pty Ltd has exercised due and customary care in the preparation of this Bushfire Management Plan and has not, unless specifically stated, independently verified information provided by others.

Any recommendations, opinions or findings stated in this report are based on circumstances and facts as they existed at the time Smith Bushfire Consultants Pty Ltd performed the work. Any changes in such circumstances and facts upon which this document is based may adversely affect any recommendations, opinions or findings contained in this plan.

Document control

Report Version	Purpose	Author/reviewer and accreditation details	Date Submitted
1	Original BMP to support the development	Ralph Smith	19/1/2021
1.1	Revised maps and text	Ralph Smith	1/2/2021
1.2	Revised text and photographs	Ralph Smith	6/5/2021

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Section 1: Proposal Details

This BMP has been developed specifically for Lot 2 and 3 Anketell Road in accordance with the currently applicable Guidelines.



Local Development Plan
Alberó Estate, Anketell Road, Anketell



Date: 16 Dec 2020 Scale: NTS @ A3 NTS @ A1 File: 19-370 CP-1 Staff: JP/GW Checked: JP



Figure 1. A copy of the Local Development Plan as provided with the development application.

This development site is part of the significant development of the expanded area. The area to the north and west of the development site, but not immediately adjacent, is Banksia scrub. The area to the east has been cleared after the bushfire prone area map was published. This development site will be cleared ready for the construction of homes, commercial buildings and associated infrastructure.

The development site is declared as bushfire prone. Dwellings are required to be constructed to the standards described in AS 3959 as the Standard has been triggered as required through the Building Code of Australia (BCA).



Figure 2. Aerial photo of the bushfire prone area for the subject site.

Section 2: Environmental Considerations

Subsection 2.1: Native Vegetation – modification and clearing

The remaining site vegetation will be cleared as a component of this development. There is virtually no native flora on the development site, except for the future commercial portion of the development which is basically an introduced grassland, and some remnant native scrub. This development does not impact on the Bush Forever site which is to the west and separated from this development by a neighbouring lot.

Subsection 2.2: Re-vegetation/Landscape Plans

There are no public area spaces (POS) within this development. There is a large area to the west of the subdivision site that is a regional park and provides public amenity.

Section 3: Bushfire assessment results

Subsection 3.1: Assessment Inputs

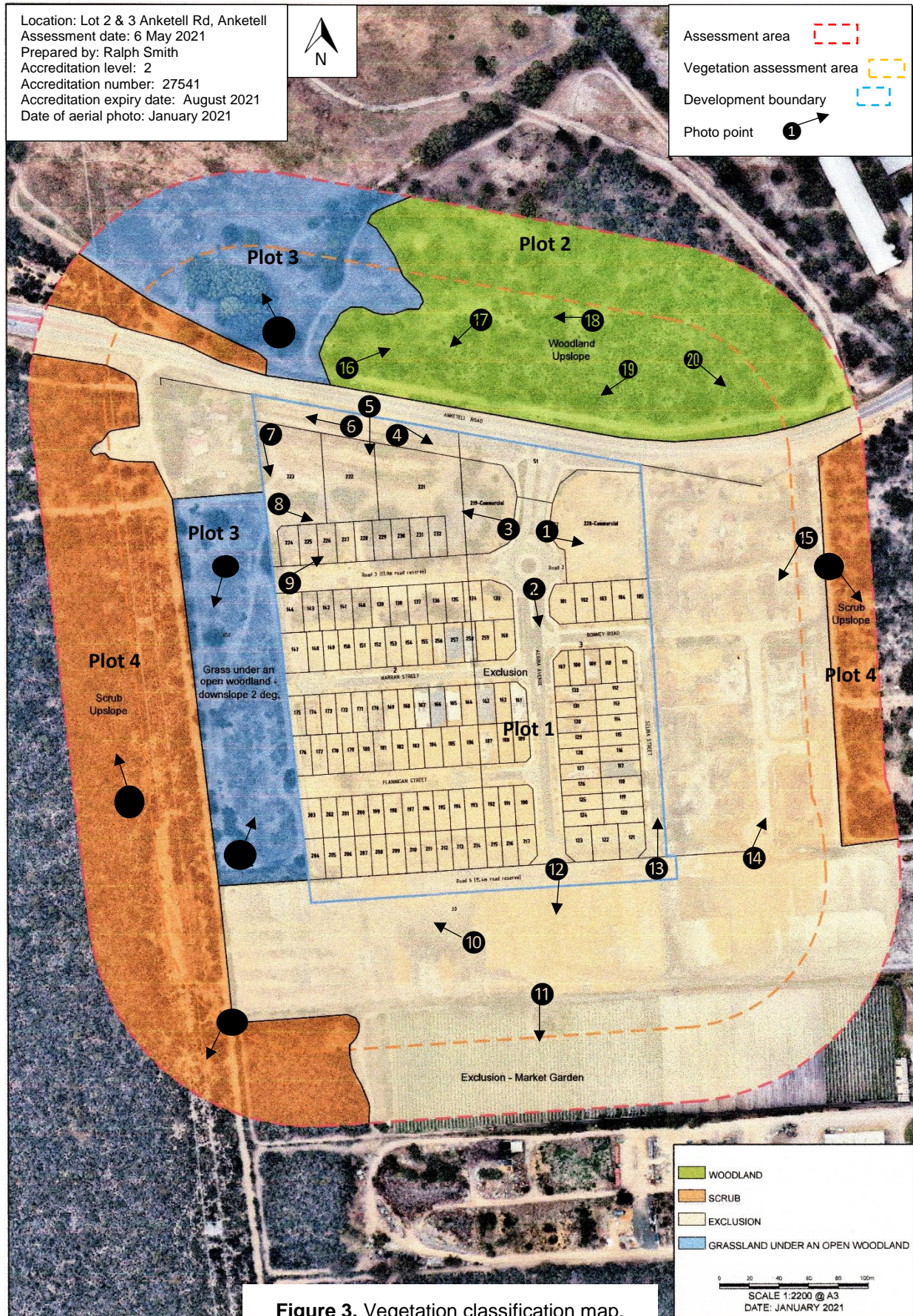


Figure 3. Vegetation classification map.

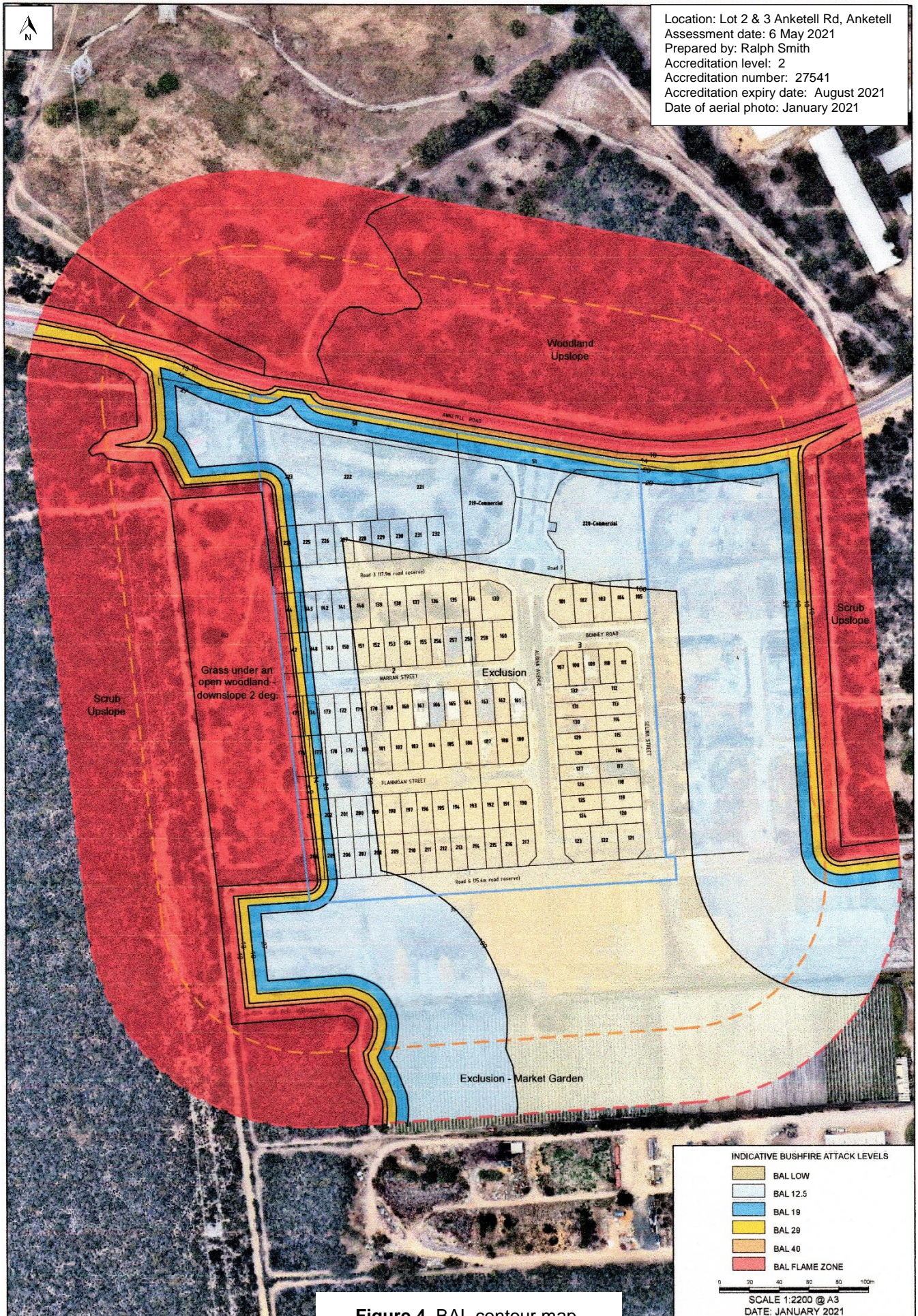


Figure 4. BAL contour map.

Plot 1
Exclusion
Clause 2.2.3.3 (e) and (f)



Photo ID: Photo 1 The cleared land within the development site and neighbouring cleared land.



Photo ID: Photo 2 The road infrastructure and dwellings within the development.



Photo ID: Photo 3 The cleared land in preparation for development on the development site.



Photo ID: Photo 4 The cultivated garden on the road reserve north of the development site.



Photo ID: Photo 5 The entrance to the EAW near Anketell Road.

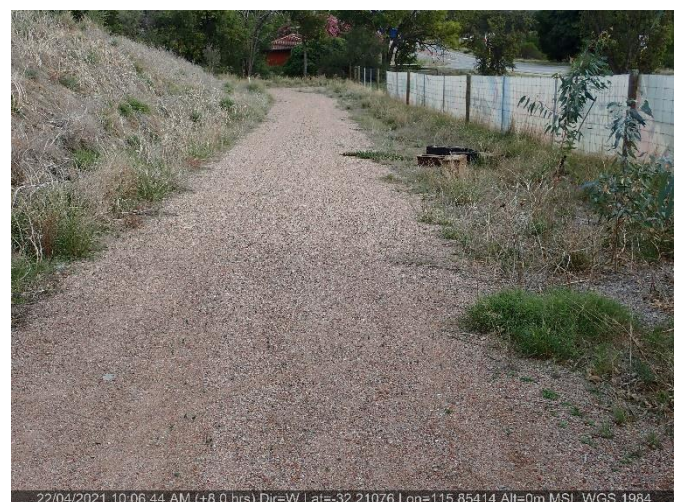


Photo ID: Photo 6 The EAW within the development site



Photo ID: Photo 7 The EAW within the development site. cleared land.



Photo ID: Photo 8 The 'low threat vegetation' and dwelling in background.



Photo ID: Photo 9 The cleared area and dwelling on the development site.



Photo ID: Photo 10 The cleared development land.



Photo ID: Photo 11 The market garden to the south of the development site.



Photo ID: Photo 12 The cleared land to the south of the current dwellings on the development site.



21/12/2020 3:17:59 PM (+8.0 hrs) Dir=NNW Lat=-32.21321 Lon=115.85627 Alt=1m MSL WGS84
Photo ID: Photo 13 The dwellings and road infrastructure on the development site.



21/12/2020 3:20:42 PM (+8.0 hrs) Dir=N Lat=-32.21416 Lon=115.85687 Alt=1m MSL WGS84
Photo ID: Photo 14 The cleared land to the east of the development site.



21/12/2020 3:55:27 PM (+8.0 hrs) Dir=WSW Lat=-32.21191 Lon=115.85748 Alt=1m MSL WGS84
Photo ID: Photo 15 The infrastructure and cleared land to east of the development site on neighbouring land.

Plot 2

Class B – Woodland (AS 3959 vegetation classification B-05)



22/04/2021 10:15:38 AM (+8.0 hrs) Dir=ENE Lat=-32.21058 Lon=115.85474 Alt=0m MSL WGS 1984
Photo ID: Photo 16 The woodland vegetation north of the development site.



22/04/2021 10:18:11 AM (+8.0 hrs) Dir=WSW Lat=-32.21033 Lon=115.85518 Alt=0m MSL WGS 1984
Photo ID: Photo 17 The woodland vegetation north of the development site. Note the sparse jarrah trees.



22/04/2021 10:19:30 AM (+8.0 hrs) Dir=W Lat=-32.21034 Lon=115.85537 Alt=0m MSL WGS 1984
Photo ID: Photo 18 The woodland vegetation with the sparse jarrah trees.



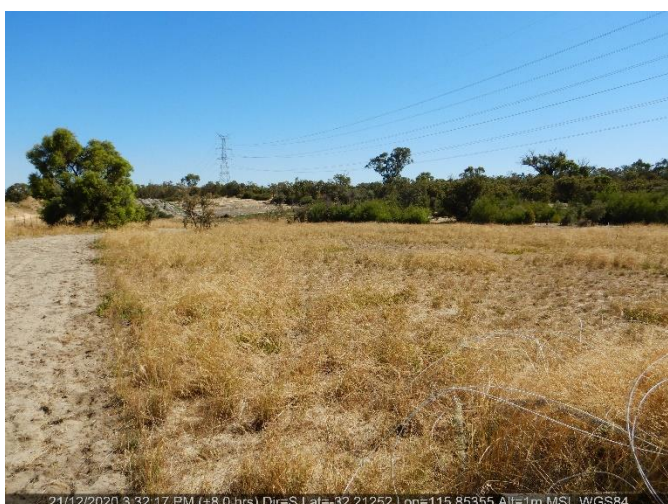
22/04/2021 10:20:36 AM (+8.0 hrs) Dir=WSW Lat=-32.21036 Lon=115.85572 Alt=0m MSL WGS 1984
Photo ID: Photo 19 The woodland vegetation .



22/04/2021 10:26:32 AM (+8.0 hrs) Dir=SSE Lat=-32.21044 Lon=115.85692 Alt=0m MSL WGS 1984
Photo ID: Photo 20 The woodland vegetation north of the site.

Plot 3

Class G – Grassland under an open woodland (AS 3959 vegetation classification G-06)



21/12/2020 3:32:17 PM (+8.0 hrs) Dir=S Lat=-32.21252 Lon=115.85355 Alt=1m MSL WGS84
Photo ID: Photo 21 The grassland vegetation west of the site.



21/12/2020 3:30:52 PM (+8.0 hrs) Dir=NNE Lat=-32.21338 Lon=115.85346 Alt=1m MSL WGS84
Photo ID: Photo 22 The grassland vegetation under an open woodland west of the development site.



21/12/2020 3:40:33 PM (+8.0 hrs) Dir=NNW Lat=-32.21002 Lon=115.85268 Alt=1m MSL WGS84
Photo ID: Photo 23 The grassland vegetation north of the site.

Plot 4

Class D – Scrub (AS 3959 vegetation classification D-13)



21/12/2020 3:27:21 PM (+8.0 hrs) Dir=S Lat=-32.21436 Lon=115.85327 Alt=1m MSL WGS84
Photo ID: Photo 24 The scrub vegetation south-west of the development site.



21/12/2020 3:28:57 PM (+8.0 hrs) Dir=W Lat=-32.21383 Lon=115.85289 Alt=1m MSL WGS84
Photo ID: Photo 25 The scrub vegetation west of the site.



21/12/2020 3:54:36 PM (+8.0 hrs) Dir=S Lat=-32.21161 Lon=115.85748 Alt=1m MSL WGS84
Photo ID: Photo 26 The scrub vegetation east of the site.

Notes to Accompany Vegetation Classification

1. Plot 1

Exclusion – Low threat vegetation and non-vegetated areas
Clause 2.2.3.2 (e) and (f)

This plot comprises the houses, cultivated and reticulated gardens and infrastructure within and adjacent to the subdivision site. It includes the road infrastructure and developed land adjacent to the lot. The cultivated gardens in the road reserve north of the development have been included in this plot. This plot also includes the proposed section road widening and the commercial sites that have an approved LDP and limited tree retention is required means that this area achieves the AS 3959 criteria.

This plot also includes the area to be cleared as a component of this development in the northern section of the site, which is the approved LDP for the commercial development site.

2. Plot 2

Class B – Woodland (AS 3959 vegetation classification B–05)

This plot comprises the land to the north of the development site across Anketell Road. Currently it is intact woodland tree overstorey with a multi-tiered scrub understorey. This plot has a mixture of overstorey tree species, such as jarrah and banksia. Banksia is the primary overstorey vegetation species, with some sparse and scattered jarrah and marri trees. A basal area assessment of this vegetation estimated on a line around 100 metres with nine sample points, north and parallel to the Anketell Road provided a 1.88 m² basal area of jarrah and marri trees. When compared to the basal area to crown cover percentage¹ a basal area of 1.88 m² is less than 10% crown cover. This plot is very close to being able to be classified as scrub as a consequence of the level of *Banksia spp.*, *Melaleuca spp.* and *Leptospermum spp.* foliage coverage.

3. Plot 3

Class G – Grassland and also a sparse overstorey with a grassland surface vegetation (AS 3959 vegetation classification G–06)

This plot comprises the land to the west, adjacent to the subdivision site. There is an absence of a multi-tiered scrub layer beneath the tree overstorey. The overstorey cover is less than 10% and contains a grassland surface vegetation.

4. Plot 4

Class D – Scrub (AS 3959 vegetation classification D–13)

This plot comprises the scrub that is west of the development site and is classified as Regional Park. The principle overstorey vegetation is *Banksia spp.* This portion of the plot is separated from the development site by grassland under an open woodland and a current dwelling and yard on the neighbouring property.

The plants in the eastern portion of the plot are *Banksia spp.* and separated from the development site by recent clearing and land development. This area is cleared, and roads have been constructed.

¹ Sneeuwjagt and Peet, 2011, "Forest Fire Behaviour Tables for Western Australia", Department of Conservation and Land Management, Perth

Slope

The orange line on the map shows the five-metre contour lines.

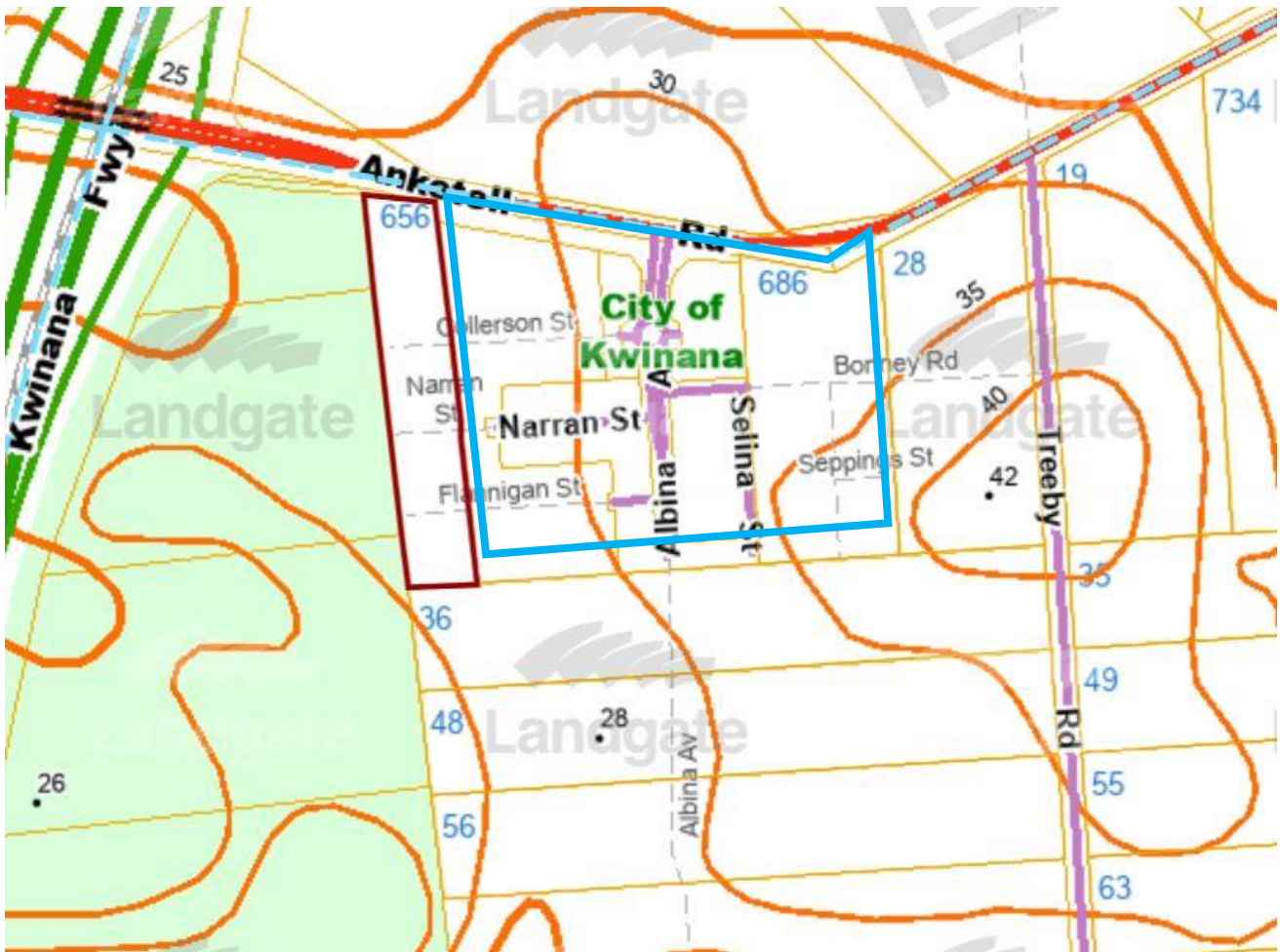


Figure 5. Five-metre contour map.

Subsection 3.2: Assessment outputs

Method 1 BAL Determination				
Vegetation Area/Plot	Applied Vegetation Classification	Effective Slope Under the Classified Vegetation (degrees)	Separation Distance to the Classified Vegetation (metres)	Bushfire Attack Level
1	Exclusion	Not applicable	Not applicable	LOW
2	Woodland	Upslope	32	12.5
3	Scrub	Upslope	68	12.5
4	Grassland under an open woodland	Downslope 0 - <5°	5	FZ
Determined Bushfire Attack Level				FZ

Lots will not be created until they can be BAL rated as BAL-29 or lower.

In the future, the proposed new lots currently rated as BAL-40 or BAL-FZ will require a BAL reassessment, prior to being able to be finalised for developed or offered for sale.

Section 4: Identification of bushfire hazard issues

The principle bushfire hazard is the native woodland vegetation to the north, the Banksia scrub to the west and also the east of the development site. By requiring the future dwellings to be constructed to the appropriate bushfire standard will further enhance the protection of the community.

Section 5: Assessment against the Bushfire Protection Criteria

Subsection 5.1: Compliance

Bushfire protection criteria	Method of Compliance	Proposed bushfire management strategies
	Acceptable solutions	
Element 1: Location	A1.1 Development location	This development will be developed in such a manner that on completion the lots offered for sale will be at BAL-29 or lower. The proposed lots that are currently rated at BAL-40 or BAL-FZ will not be created until they can be BAL rated at BAL-29 or lower. There will be no APZs required on these lots.
Element 2: Siting and design	A2.1 Asset Protection Zone (APZ)	
Element 3: Vehicular access	A3.1 Two access routes	There are multiple access options that facilitate movement to a range of alternative locations and directions of travel.
	A3.2 Public road	All public roads will be constructed to the appropriate standards as required in the Guidelines.
	A3.3 Cul-de-sac (including a dead-end-road)	There will be no dead-end roads in the subdivision that exceed the requirements in the Guidelines.
	A3.4 Battle-axe	There will be no battle-axe access in the subdivision that exceed the requirements in the Guidelines.
	A3.5 Private driveway longer than 50 m	Not applicable.
	A3.6 Emergency access way (EAW)	A temporary EAW along the western boundary of the development site is already constructed and in place.
	A3.7 Fire service access routes (perimeter roads)	Not applicable.
	A3.8 Firebreak width	Firebreaks will be established and maintained in accordance with the City's firebreak and fuel load notice.
Element 4: Water	A4.1 Reticulated areas	The site will be serviced with reticulated mains water in accordance with the State Government requirements.
	A4.2 Non-reticulated areas	Not applicable.
	A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively)	Not applicable.

Subsection 5.2: Additional management strategies



Legend

- 1. Subject land ---
- 2. Roads
- 3. Temporary emergency access way location ---

Notes

1. AS 3959 construction standards apply to the areas within the declared bushfire prone area.
2. The site will have reticulated mains water supply.
3. Woodland to the north and scrub to the east and west are the primary vegetation plots that provide an ongoing bushfire threat.
4. This section of the site will be cleared during the development.
5. The neighbouring property to the west is effectively grassland.
6. The BAL-40 and BAL-FZ lots will not be created until they can be BAL rated at BAL-29 or lower.
7. Land recently cleared and developed with infrastructure.

Location details: Lot 2 and 3 Anketell Road, Anketell
 Local government area: City of Kwinana
 Assessment date: 6 May 2021
 Prepared by: Ralph Smith
 Accreditation level: 2
 Accreditation number: 27541
 Accreditation Expiry Date: August 2021
 Date of Aerial photo: January 2021
 Version No: 1.2

Figure 6. Spatial representation of bushfire management strategies.

Section 6: Responsibilities for Implementation and Management of the Bushfire Measures

DEVELOPER/LANDOWNER – PRIOR TO SALE OR OCCUPANCY	
No.	Implementation Action
1	Install the access ways, and associated signs to the standards stated in the Guidelines.
2	Install the temporary emergency access way in accordance with the standards required in the Guidelines.
2	Install the required water supply that meets State Government's specifications.
3	<p>A notification, pursuant to Section 165 of the <i>Planning and Development Act 2005</i> is to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:</p> <p><i>"This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land".</i></p> <p>(Western Australian Planning Commission)</p>
4	The developer is to inform the purchaser of the BMP and the requirements to comply where appropriate.

LANDOWNER/OCCUPIER – ONGOING MANAGEMENT	
No.	Management Action
1	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.
2	Owners of properties with increased construction standards must maintain on an ongoing basis so that those dwelling are compliant with the increased construction standards.

Appendix 1

Vehicle technical requirements extracted from the Guidelines (page 68).

Table 4: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5
* Refer to E3.2 Public roads: Trafficable surface					

Appendix 2

Access external to the development site that shows there are numerous alternative access options to alternative destinations.



Appendix 3

Precalculation plan.



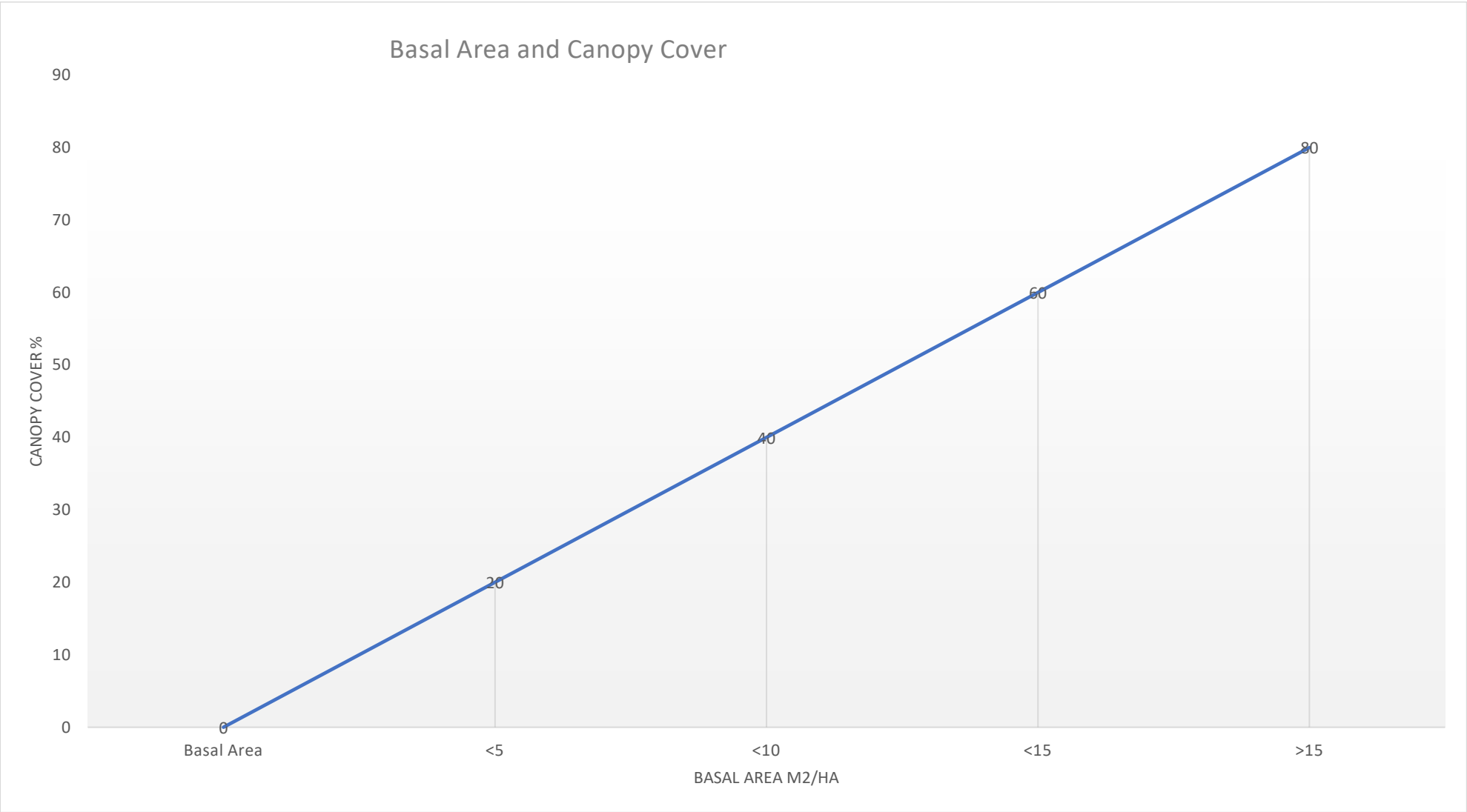
Appendix 4

Map showing the Bush Forever site, which is shaded green and hatched. This area is also classified as an environmentally sensitive area. There is no declared flora or fauna within the assessment area.



Appendix 5

Graphed data from Table 7.1.3. within the “Forest Fire Behaviour Tables for Western Australia.” A 10% crown cover requires a basal area of 2.5 m²/ha. The basal area assessment of live jarrah or marri trees for this plot was an average of 1.88 m²/ha which included one patch of 7 m²/ha and another of 4 m²/ha. The other seven sample points were 2 m²/ha or less, and three sample points with no jarrah or marri trees.



References

- Australian Building Codes Board, (2019). *Building Code of Australia*. Australian Building Codes Board, Sydney.
- City of Kwinana, (2020). *Fire Break Notice 2020/21*. Retrieved 28 August 2020 from <https://kwinana.wa.gov.au/forms-and-publications/your-services/fire-and-bush/fire-control-notice-2020-2021>
- Near map from <http://maps.au.nearmap.com/>
- Slope percentage to degrees conversion from <https://www.calcunation.com/calculator/slope-percent-conversion.php>
- Contour map from <https://maps.agric.wa.gov.au/nrm-info/>
- Landgate, (2021). *Map of Bushfire Prone Areas*. Retrieved 8 January 2021 from <https://maps.slip.wa.gov.au/landgate/bushfireprone/>
- Standards Australia. (2018). *Australian Standard 3959 – Construction of buildings in bushfire-prone areas*. Standards Australia, Sydney, NSW.
- Western Australian Planning Commission. (2015). *State Planning Policy 3.7 – Planning in Bushfire Prone Areas*. Western Australian Planning Commission, Perth, WA.
- Western Australian Planning Commission. (2017). *Guidelines for Planning in Bushfire Prone Areas*. Western Australian Planning Commission, Perth, WA. December 2017.
- Hydrant and water meter locations from <https://espatial.dplh.wa.gov.au/PlanWA/Index.html?viewer=PlanWA>
- Water Corporation, (2012). *Design Standard DS 63 Water Reticulation Standard Design and Construction Requirements for Water Reticulation System up to DN250*. Water Corporation, Perth.
- Bush Forever and environmental sensitive area maps from <https://maps.agric.wa.gov.au/nrm-info/>
- Declared flora and fauna data interrogated on <https://maps.agric.wa.gov.au/nrm-info/>
- R. J. Sneeuwagt and G. B. Peet, (2001). *Forest Fire Behaviour Tables for Western Australia*. Department of Conservation and Land Management