WESTERN ENVIRONMENTAL

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Bushfire Attack Level (BAL) Assessment Report

Site details	
Address: Stage 2 Claravale Estate (Lots 134-136, 197-209, 211, 217-236, 247-250, 378)	
Suburb: Hilbert	**State:** Western Australia
Local Government Area: City of Armadale	
Description of Building Works: Class 1a dwellings	

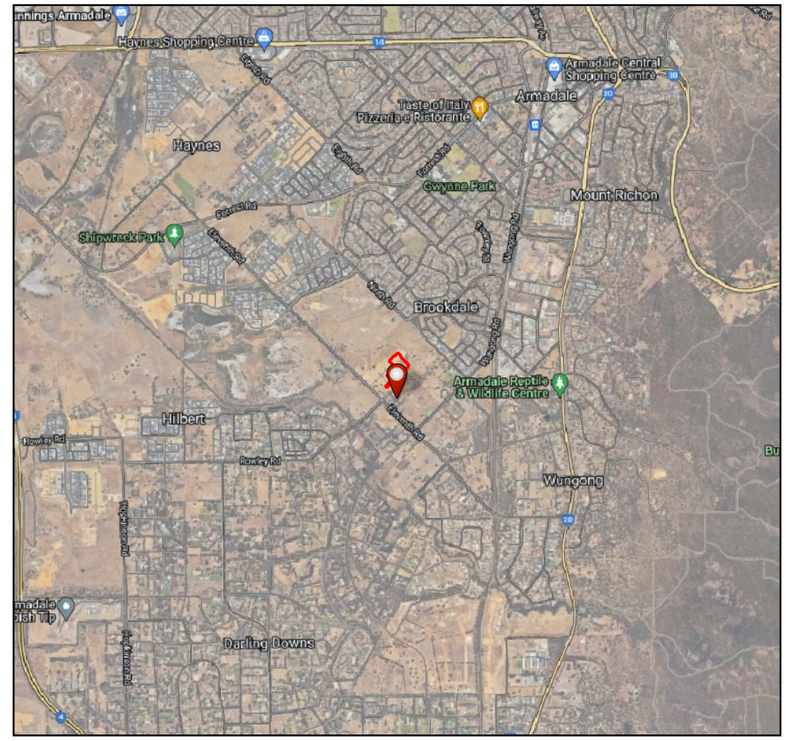
Report details			
Project number	A23.097	**Report version**	0
Assessment date	10/09/2023	**Report date**	13/10/2023
Author	Bridie Farrar	**Review**	Daniel Panickar (BPAD L3 -37802)

Site Assessment and Site Plan

The assessment of the 44 subject lots was undertaken on 19/09/2023 and 10/10/2023 for the purpose of determining the Bushfire Attack Level (BAL) in accordance with *Australian Standard AS 3959: 2018 Construction of Buildings in Bushfire Prone Areas* (AS 3959: 2018; SA 2018) Simplified Procedure (Method 1). An overview of the site is presented in Figure 1.

Vegetation Classification

All vegetation within 100 m of the 44 subject lots was classified in accordance with Clause 2.2.3 of AS 3959: 2018. Each distinguishable vegetation class with the potential to determine the BAL is identified in Table 1 and presented in Figure 2.



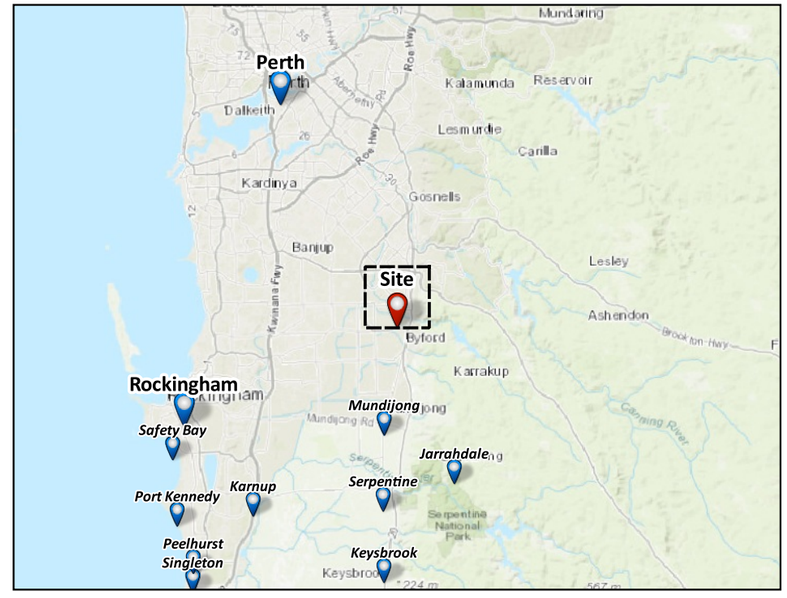


Figure 1: Site Overview

N

0 40 80 120 160 m

SCALE: 1:2,981	SHEET SIZE: A3 COLOUR	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.097	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/BF	DATE: 27/9/2023

PROJECT/REPORT NAME
Claravale BMP compliance assessment
Hilbert
Western Australia 6112

CLIENT
Parcel Property

Legend

- Subject Site
- Buffer 100m
- Buffer 150m
- Lots

No	Description	Drawn	Approved	Date
A	Original issue	MD	BF	27/9/2023

NOTES:

Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).

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Table 1: Vegetation Classification

Plot 1	Class G Grassland
Photo 1 Overstorey cover less than 10%. Understorey dominated by grasses and other herbaceous vegetation. Whilst there are trees present in this plot, particularly in the southeast, these are primarily present in windbreaks and small clusters. When considered in the broader bushfire threat landscape (e.g. within 500 m of the site), the amount of tree cover is marginal (<10%) and the bushfire behaviour most likely to affect the site will be associated with fast-moving grassland fuels rather than slower moving, but longer burning woodland fuels. The slope under this vegetation was assessed to be upslope/flat land.	
Plot 1	**Class G Grassland**
Photo 2 Whilst there are trees present in this plot, particularly in the southeast, these are primarily present in windbreaks and small clusters. Tree cover is marginal when considered in the broader bushfire threat landscape. The slope under this vegetation was assessed to be upslope/flat land.	
Plot 2	**Class G Grassland**
Photo 3 Overstorey cover less than 10%. Understorey dominated by grasses and other herbaceous vegetation. The slope under this vegetation was assessed to be upslope/flat land.	

Plot 3	Excluded - clause 2.2.3.2 (e) & (f)
Photo 4 Cleared areas and areas with vegetation managed to a low-threat state.	
Plot 3	**Excluded - clause 2.2.3.2 (e) & (f)**
Photo 5 Areas partially cleared for development and vegetation maintained to a low-threat state. Excluded under AS 3959.	
Plot 3	**Excluded - clause 2.2.3.2 (e) & (f)**
Photo 6 Areas cleared for development surrounding the subject site.	

Plot 3	Excluded - clause 2.2.3.2 (e) & (f)
Photo 7 This area is dedicated as Public Open Space (POS) for this subdivision. The area surrounding the trees has been cleared and will be maintained to a low-threat state. Fire is unlikely to travel across the bare earth surrounding the POS area and as such, does not pose a considerable threat to Stage 2. This vegetation is therefore excluded under AS 3959.	
Plot 3	**Excluded - clause 2.2.3.2 (e) & (f)**
Photo 8 Vegetation that is maintained to a low-threat state (i.e. slashed, maintained grass within Claravale Estate).	

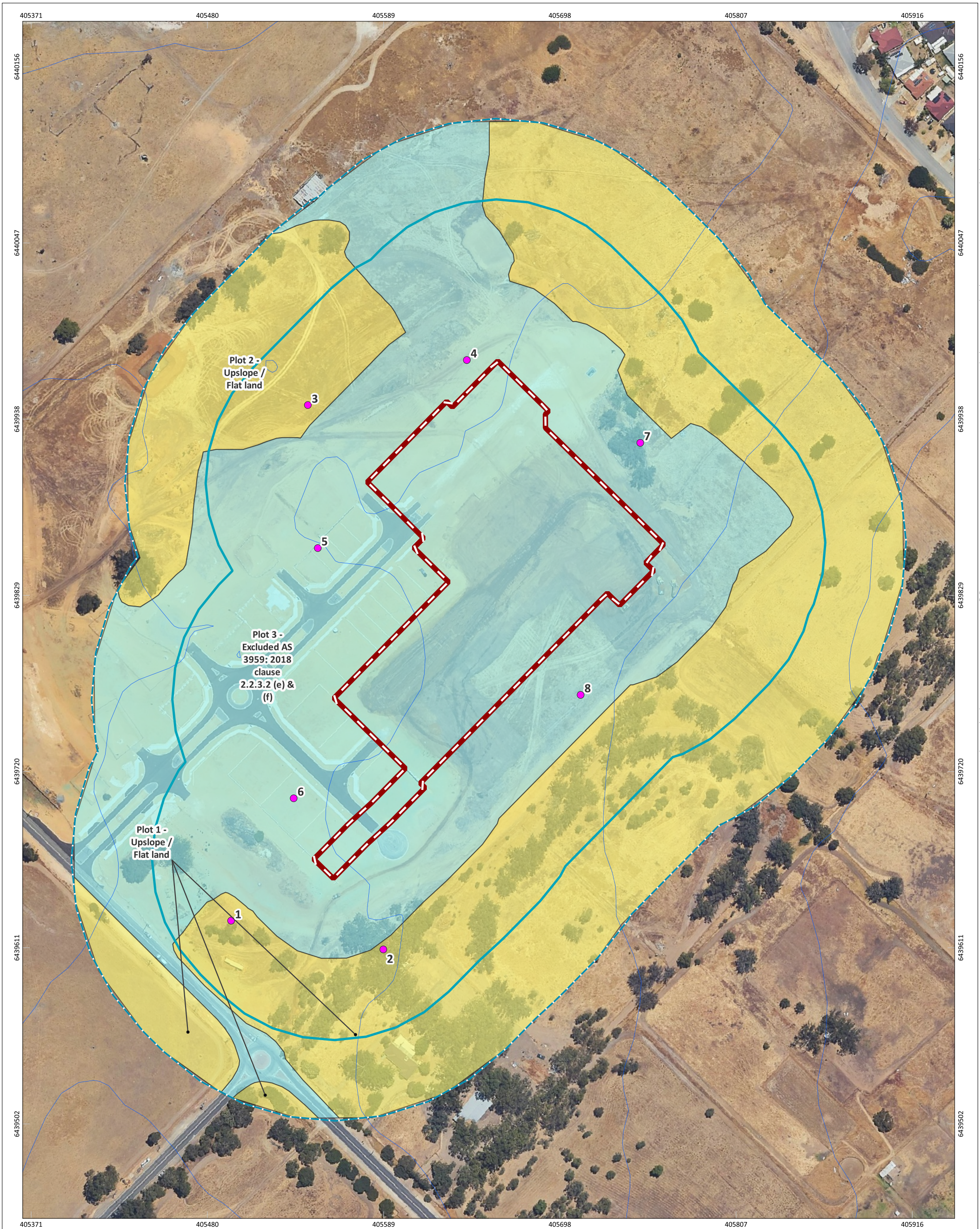

Figure 2: Vegetation Classification

N 0 20 40 60 80 m		PROJECT/REPORT NAME: Claravale BMP compliance assessment Hilbert Western Australia 6112	
SCALE: 1:2,175	SHEET SIZE: A3 COLOUR	CLIENT: Parcel Property	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A23.097	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY: MD/BF	DATE: 27/9/2023

Legend

- Subject Site
- Buffer 100m
- Buffer 150m

2m Contours (DPIRD-072)

- Each 5 m
- Each 2 m

Photos

- Photos
- Class G - Grassland
- Excluded AS 3959: 2018 2.2.3.2

No	Description	Drawn	Approved	Date
A	Original issue	MD	BF	27/9/2023

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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Relevant Fire Danger Index

The Fire Danger Index for this site has been determined in accordance with Table 2.1 of AS 3959: 2018 and is presented in Table 2.

Table 2: Fire Danger Index (FDI)

Relevant Fire Danger Index			
FDI 40 ☐ *Table 2.4.5*	FDI 50 ☐ *Table 2.4.4*	FDI 80 ✓ *Table 2.4.3*	FDI 100 ☐ *Table 2.4.2*

Potential Bushfire Impacts

The potential bushfire impact to the site from each of the identified vegetation plots are identified below in Table 3.

Table 3: Method 1 BAL Calculation (BAL Contours)

Plot	Vegetation classification	Effective slope	Separation distances required (m)				
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
1	Class G Grassland	All upslopes and flat land (0 degrees)	<6	6 - <8	8 - <12	12 - <17	17 - <50
2	Class G Grassland	All upslopes and flat land (0 degrees)	<6	8 - <8	8 - <12	12 - <17	17 - <50
3	Excluded - clause 2.2.3.2 (e) & (f)	-	No separation distances required - BAL-LOW				

Determined Bushfire Attack Level (BAL)

The determined Bushfire Attack Level (highest BAL) for the proposed works has been determined in accordance with Clause 2.2.6 of AS 3959: 2018 relevant data from the site assessment shown in Figure 3 and Table 4.

Table 4: BAL Assessment Summary

BAL	Affected lots	Construction sections to be consulted in AS 3959: 2018
BAL-LOW	134, 135, 136, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 211, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 247, 248, 249, 250, 378	3 and 4

Note: This BAL rating is based on the information current at the date of this document and is valid for 12 months.

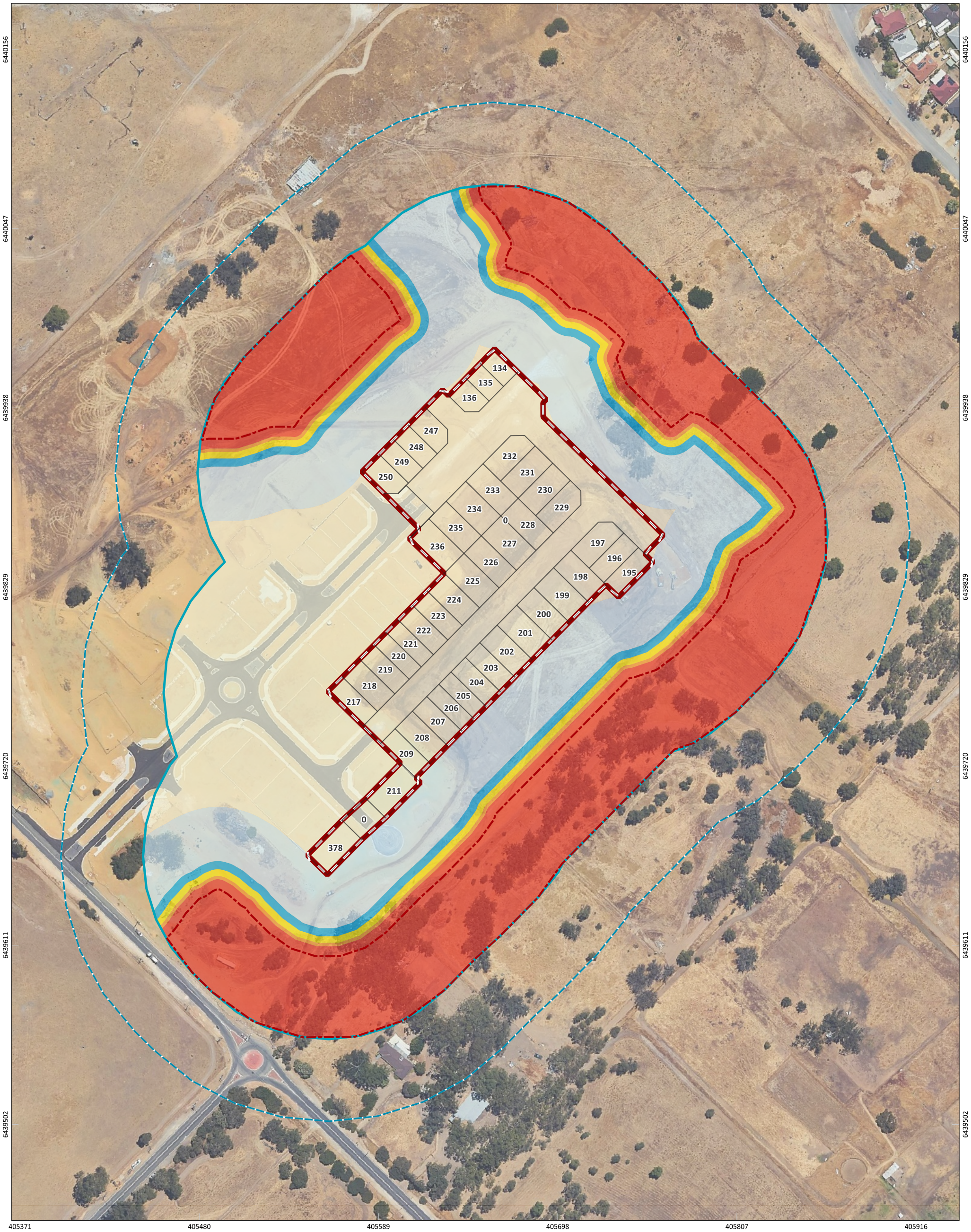

Figure 3: Bushfire Attack Level (BAL) Contours

N 0 20 40 60 80 m	PROJECT/REPORT NAME: Claravale BMP compliance assessment Hilbert Western Australia 6112		
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COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.097	VERSION: 0	
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/BF	DATE: 27/9/2023	

Legend

- Subject Site
- Buffer 100m
- Buffer 150m
- Lots
- Bushfire hazard Interface

Bushfire Attack Level (BAL)

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

No	Description	Drawn	Approved	Date
A	Original issue	MD	BF	27/9/2023

NOTES:

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Appendix A
Additional Information / Advisory Notes

This assessment was undertaken as per AS 3959: 2018. It is important that the current version of AS 3959, is consulted for construction purposes.

This BAL rating is based on the information current at the date of this letter and is valid for 12 months from the date of this letter.

Bushfire Attack Level (BAL) as set out in the Australian Standard 3959 Construction of Buildings in Bushfire-Prone Areas (AS 3959), as referenced in the Building Code of Australia.

Bushfire Attack Level (BAL)	Classified vegetation within 100 m of the site and radiant heat flux exposure thresholds	Description of predicted bush fire attack and levels of exposure	Construction Section as per AS 3959
BAL-LOW		There is insufficient risk to warrant specific construction requirements.	4
BAL-12.5	≤12.5 kW/m^2	Ember attack	3 and 5
BAL-19	>12.5 kW/m^2 ≤19 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing radiant heat flux.	3 and 6
BAL-29	>19 kW/m^2 ≤29 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing radiant heat flux	3 and 7
BAL-40	>29 kW/m^2 ≤40 kW/m^2	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing radiant heat flux with the increased likelihood of exposure to flames.	3 and 8
BAL-FZ	>40 kW/m^2	Direct exposure to flames from fire front in addition to radiant heat flux and ember attack	3 and 9

Source: "*AS 3959: 2018 Construction of buildings in bushfire-prone areas*" published by Standards Australia, Sydney.