

Appendix D

Bushfire Management Plan

This page has been left blank intentionally.

To: Jeremy Malaxos

Date: 4 August 2016

Company: General Property Assets

Project No: GPA15164.01

Fax/email: Jeremy@generalpropertyassets.com.au

Inquiries: D Panickar / R Banks

Bushfire Hazard Level and Bushfire Attack Level Assessment Lot 55 Chapman Road, Glenfield

Background

Lot 55 Chapman Road, Glenfield (the Site) is owned by ASDC Pty Ltd (ASDC). The Site is located approximately 9 km north of the Geraldton City Centre and can be accessed from Geraldton via Chapman Road and the North West Coastal Highway. The Site is approximately 12.22 ha in size and is currently zoned 'urban development' under the City of Greater Geraldton (CoGG) Local Planning Scheme No. 1. The Site is proposed to be rezoned as 'service commercial'. A Structure Plan has been prepared by Town Planning Group (TPG) to allow for development of the Site as a commercial precinct.

The Site is situated within a designated bushfire prone area as depicted in the *Western Australia State Map of Bush Fire Prone Areas* (DFES 2016). Strategen were commissioned by General Property Assets (GPA) on behalf of ASDC to conduct a Bushfire Hazard Level Assessment to support the Structure Plan.

Purpose of Bushfire Hazard Level and Bushfire Attack Level contour assessment

This Bushfire Hazard Level and Bushfire Attack Level (BAL) contour assessment has been prepared by Strategen to guide an appropriate and compliant bushfire mitigation response for proposed development within the Site in accordance with requirements of *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015a), *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2015b) and *AS 3959–2009 Construction of Buildings in Bushfire-prone Areas* (AS 3959–2009, SA 2009). The assessment informs the landowners of any increased construction requirements that may apply to future buildings due to the proximity of bushfire hazards to the Site.

Existing site characteristics

The Site currently comprises coastal dunes and swales containing a mixture of shrubland and scrub vegetation. Vegetation within 100 m of the Site comprises of a mosaic of forest, woodland, shrubland, scrub and grassland vegetation.

Vegetation within the Site is proposed to be cleared prior to development occurring and therefore has been classified as a non-vegetated area as per Clause 2.2.3.2(e) of AS3959-2009. Vegetation within the surrounding 100 m of the Site is comprised of the following vegetation classes assessed in accordance with the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016) and AS 3959-2009:

- Class A forest (Plate 1)
- Class B woodland (Plate 2)
- Class C Shrubland (Plate 3; Plate 4; Plate 5)
- Class D Scrub (Plate 6)
- Class G Unmanaged Grassland (Plate 7)
- Non-vegetated areas and low threat vegetation as per Clauses 2.2.3.2 (e) and (f) of AS3959-2009 (Plate 8).

Two vegetated areas containing Class A forest vegetation and Class B woodland vegetation are located to the northeast of the Site. Class C shrubland vegetation occupies areas of land to the north, west and south of the Site. Two vegetated areas Class D scrub vegetation are located to the north and southeast of the Site, while Class G grassland vegetation lies to the east and southeast of the Site. The remainder of land within 100 m of the Site consists of non-vegetated areas and low threat vegetation consistent with Clauses 2.2.3.2 (e) and (f) of AS 3959–2009. Vegetation classes as described above are depicted in Figure 1.

The slope under vegetation within adjacent land 100 m from the Site is described below and depicted in Figure 1:

- vegetation to the north: slope under vegetation assessed between 5-10 degrees
- all other vegetation: slope under vegetation assessed as flat or upslope from the Site.



Plate 1: Classified class A forest north of the Site



Plate 2: Classified class B woodland north of the Site



Plate 3: Classified class C shrubland northwest of the Site



Plate 4: Classified class C shrubland west of the Site



Plate 5: Classified class C shrubland south of the Site



Plate 6: Classified class D scrub northeast of the Site



Plate 7: Class G grassland east of the Site



Plate 8: Non vegetated areas as per Clause 2.2.3.2 (e) of AS 3959-2009

Bushfire hazard level assessment

Strategen considers vegetation within the identified Class A forest vegetation, Class B woodland vegetation, Class C shrubland vegetation, Class D scrub vegetation and Class G grassland vegetation as posing a 'Moderate' bushfire hazard level as a result of the fragmented, narrow nature of the vegetation fuel components. Areas of the Site within 100 m of the above vegetation types has also been assigned a 'Moderate' bushfire hazard level to reflect the increased level of risk associated with proximity to bushfire prone vegetation as per methodology described in the Guidelines.

The remaining vegetated and non vegetated areas (including areas to be cleared for development) within the assessment area have been assessed as exclusions to classified vegetation in accordance with Clauses 2.2.3.2 (e) and (f) of AS 3959-2009, resulting in a 'Low' bushfire hazard level. The bushfire hazard level assessment is presented in Figure 1.

BAL contour assessment

A BAL contour assessment has been undertaken for the Site in accordance with methodology from AS 3959-2009 (Method 1), as depicted in Figure 2.

Parameters for the BAL assessment are as follows:

- WA Fire Danger Index (FDI) rating: FDI 80
- vegetation class: Class A forest, Class B woodland, Class C shrubland, Class D scrub and Class G unmanaged grassland
- slope under classified vegetation (refer to Figure 1):
 - * between 5-10 degrees to the north
 - * at equal elevation or upslope from the Site in all other areas.

Table 1 and Figure 2 display BAL contours for classified vegetation within and adjacent to the Site.

Table 1: BAL contour distances

Vegetation class	Slope under classified vegetation	Distance from classified vegetation			
		Asset Protection Zone (APZ)	BAL 29	BAL 19	BAL 12.5
Class A forest	Vegetation at equal elevation to, or upslope from Site	0-<21 m	21-<31 m	31-<42 m	42-<100 m
	Vegetation downslope at an angle of 0–5 degrees from Site	0-<27 m	27-<37 m	37-<50 m	50-<100 m
Class B woodland	Vegetation at equal elevation to, or upslope from Site	0-<14 m	14-<20 m	20-<29 m	29-<100 m
	Vegetation downslope at an angle of 0–5 degrees from Site	0-<17 m	17-<25 m	25-<35 m	35-<100 m
Class C shrubland	Vegetation at equal elevation to, or upslope from Site	0-<9 m	9-<13 m	13-<19 m	19-<100 m
	Vegetation downslope at an angle of 0–5 degrees from Site	0-<10 m	10-<15 m	15-<22 m	22-<100 m
Class D scrub	Vegetation at equal elevation to, or upslope from Site	0-<13 m	13-<19 m	19-<27 m	27-<100 m
	Vegetation downslope at an angle of 0–5 degrees from Site	0-<15 m	15-<22 m	22-<31 m	31-<100 m
Class G unmanaged grassland	Vegetation at equal elevation to, or upslope from Site	0-<8 m	8-<12 m	12-<17 m	17-<50 m
	Vegetation downslope at an angle of 0–5 degrees from Site	0-<9 m	9-<14 m	14-<20 m	20-<50 m

* Construction of buildings is generally not permitted within BAL FZ and BAL 40 areas.

The final BAL for any proposed buildings on the Site will be determined once the location and design of future buildings are confirmed.

Assessment against bushfire protection criteria

As required under SPP 3.7, Strategen has undertaken an assessment of development compliance against the bushfire protection criteria within the Guidelines to demonstrate that compliance with all criteria can be met at the strategic level, or future development stages. An 'acceptable solutions' assessment is provided in Table 2 to outline the proposed bushfire management measures against each bushfire protection criteria.

Strategen reiterates that this information is being provided at the Structure Plan stage where development design is indicative and detailed planning has not yet been finalised. Consequently, more detailed bushfire management information will be provided in the form of a BMP to accompany the future development. The BMP will confirm the bushfire assessments provided in this report and inform the bushfire management measures. In addition, it is likely that additional bushfire management detail will be required to accompany the development application to resolve matters such as final BAL ratings and separation requirements for individual buildings where applicable.

Table 2: Acceptable solutions assessment against bushfire protection criteria

Bushfire protection criteria	Intent	Acceptable solutions	Proposed bushfire management measures	Compliance statement
Element 1: Location	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	<u>Acceptable solution</u> A1.1 Development location The strategic planning proposal, subdivision and 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.	The BHL assessment and BAL contour map (Figure 1 and Figure 2 respectively) demonstrate that it is possible for development to occur in areas not classed as extreme bushfire hazard or areas subject to BAL–FZ or BAL–40. The BMP provided at the development application stage will validate these findings and address bushfire risk during development staging.	The measures proposed are considered to comply and meet the intent of Element 1 Location.
Element 2: Siting and design of development	To ensure that the siting and design of development minimises the level of bushfire impact	<u>Acceptable solution</u> A2.1 Asset Protection Zone Every building is surrounded by an APZ, depicted on submitted plans, which meets detailed requirements (refer to the Guidelines for detailed APZ requirements).	The BAL contour map (Figure 2) demonstrates that the APZ can be achieved at all interfaces where proposed development abuts classified vegetation. The BMP provided at the development application stage will validate these findings.	The measures proposed are considered to comply and meet the intent of Element 2 Siting and design of development.
		<u>Acceptable solution</u> A2.2 Hazard Separation Zone Every building and its contiguous APZ is surrounded by an HSZ, depicted on submitted plans, that meets detailed requirements (refer to the Guidelines for detailed HSZ requirements). An HSZ may not be required if the proposed construction meets the standard appropriate to the BAL for that location, and does not exceed BAL–29.	HSZs are not proposed since individual building construction will meet the standard appropriate to the BAL for that location. The BMP provided at the development application stage will validate these findings.	
Element 3: Vehicular access	To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event	<u>Acceptable solution</u> A3.1 Two access routes Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.	The BMP provided at the development application stage will address vehicular access during and post development.	The measures proposed are considered to comply and meet the intent of Element 3 Vehicular access.
		<u>Acceptable solution</u> A3.2 Public road A public road is to meet the requirements in Table 2, Column 1.	The BMP provided at the development application stage will demonstrate that all proposed public roads meet minimum requirements outlined in Table 2 of the Guidelines.	

		<u>Acceptable solution</u> A3.3 Cul-de-sac (including a dead-end-road) A cul-de-sac and/or a dead end road should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent), detailed requirements will need to be achieved (refer to the Guidelines for detailed cul-de-sac requirements).	Given the nature of the development is a commercial precinct, it is unlikely that cul-de-sacs will form part of the design. Notwithstanding, adherence to the requirements outlined in Table 2 of the guidelines will be demonstrated at the development application stage.	
		<u>Acceptable solution</u> A3.4 Battle-axe Battle-axe access leg should be avoided in bushfire prone areas. Where no alternative exists, (this will need to be demonstrated by the proponent) detailed requirements will need to be achieved (refer to the Guidelines for detailed battle-axe requirements).	Given the nature of the development is a commercial precinct, it is unlikely that battle-axe lots will form part of the design. Notwithstanding, adherence to the requirements outlined in Table 2 of the guidelines will be demonstrated at the development application stage.	
		<u>Acceptable solution</u> A3.5 Private driveway longer than 50 m A private driveway is to meet detailed requirements (refer to the Guidelines for detailed private driveway requirements).	The BMP provided at the development application stage will demonstrate that any proposed private driveways longer than 50 m meet minimum requirements outlined in Table 2 of the Guidelines.	
		<u>Acceptable solution</u> A3.6 Emergency access way An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists (this will need to be demonstrated by the proponent), an emergency access way is to be provided as an alternative link to a public road during emergencies. An emergency access way is to meet detailed requirements (refer to the Guidelines for detailed EAW requirements).	The BMP provided at the development application stage will demonstrate that any proposed emergency access ways meet minimum requirements outlined in Table 2 of the Guidelines.	
		<u>Acceptable solution</u> A3.7 Fire service access routes (perimeter roads) Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for fire fighting purposes. Fire service access routes are to meet detailed requirements (refer to the Guidelines for detailed fire service access route requirements).	The BMP provided at the development application stage will demonstrate that any proposed fire service access routes meet minimum requirements outlined in Table 2 of the Guidelines.	

		<u>Acceptable solution</u> A3.8 Firebreak width Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level as prescribed in the local firebreak notice issued by the local government.	The BMP provided at the development application stage will demonstrate that any proposed firebreaks meet minimum requirements outlined in Table 2 of the Guidelines and the associated CoGG annual firebreak notice.	
Element 4: Water	To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.	<u>Acceptable solution</u> A4.1 Reticulated areas The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.	All proposed lots will be provided a reticulated water supply and network of hydrants in accordance with local water authority, City and DFES requirements. The BMP provided at the development application stage will validate these findings.	The measures proposed are considered to comply and meet the intent of Element 4 Water.
		<u>Acceptable solution</u> A4.2 Non-reticulated areas Water tanks for fire fighting purposes with a hydrant or standpipe are provided and meet detailed requirements (refer to the Guidelines for detailed requirements for non-reticulated areas).	The proposed development will not occur within a non-reticulated area. The BMP provided at the development application stage will validate these findings.	
		<u>Acceptable solution</u> A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively) Single lots above 500 square metres need a dedicated static water supply on the lot that has the effective capacity of 10 000 litres.	The proposed development will not occur within a non-reticulated area. The BMP provided at the development application stage will validate these findings.	

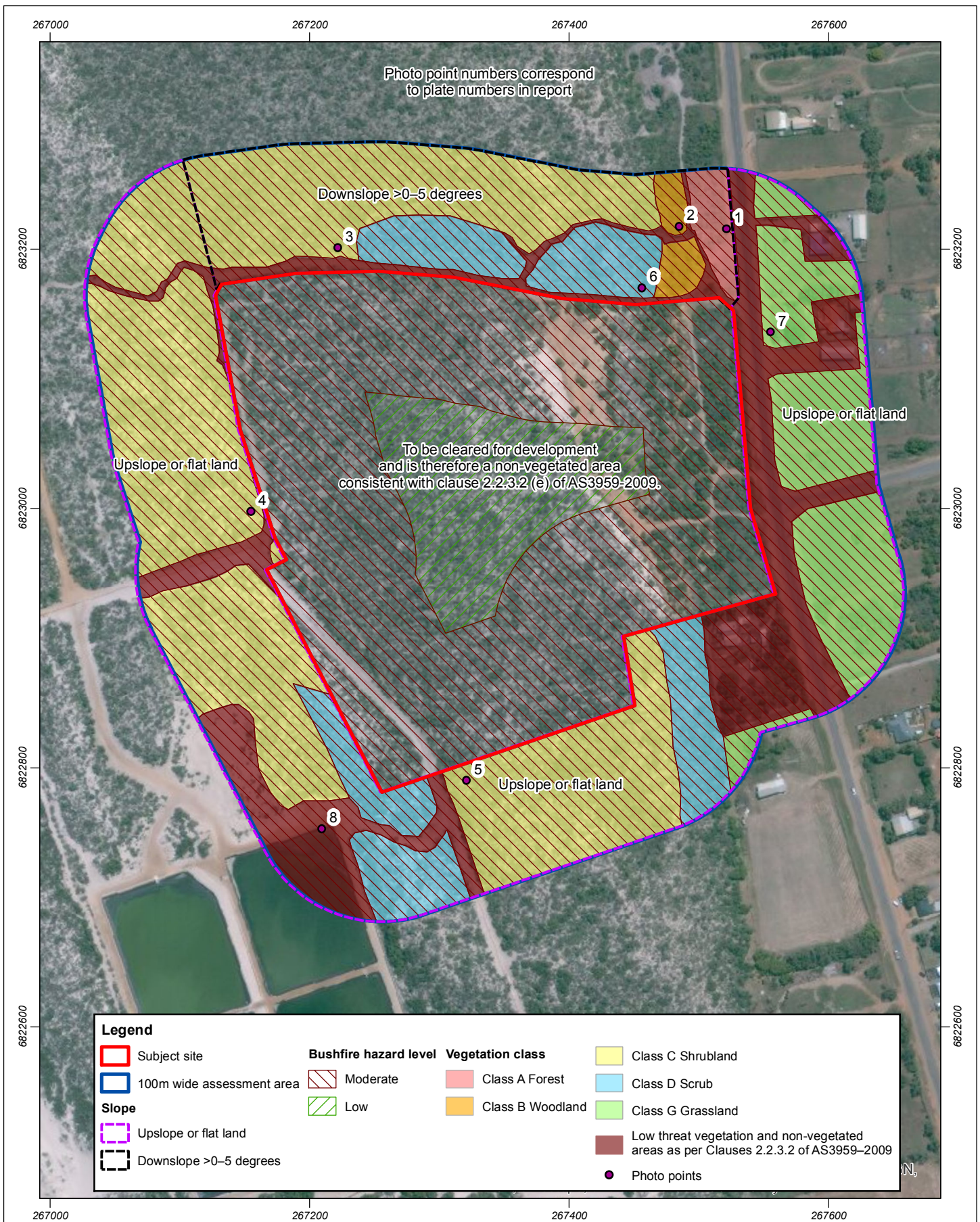


Figure 1: Vegetation class and bushfire hazard level assessment

Scale 1:3,947 at A4

0 25 50 75 100 m

Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 19/07/2016

Author: JCrute

Source: Aerial image: ESRI online, approx. 2014.

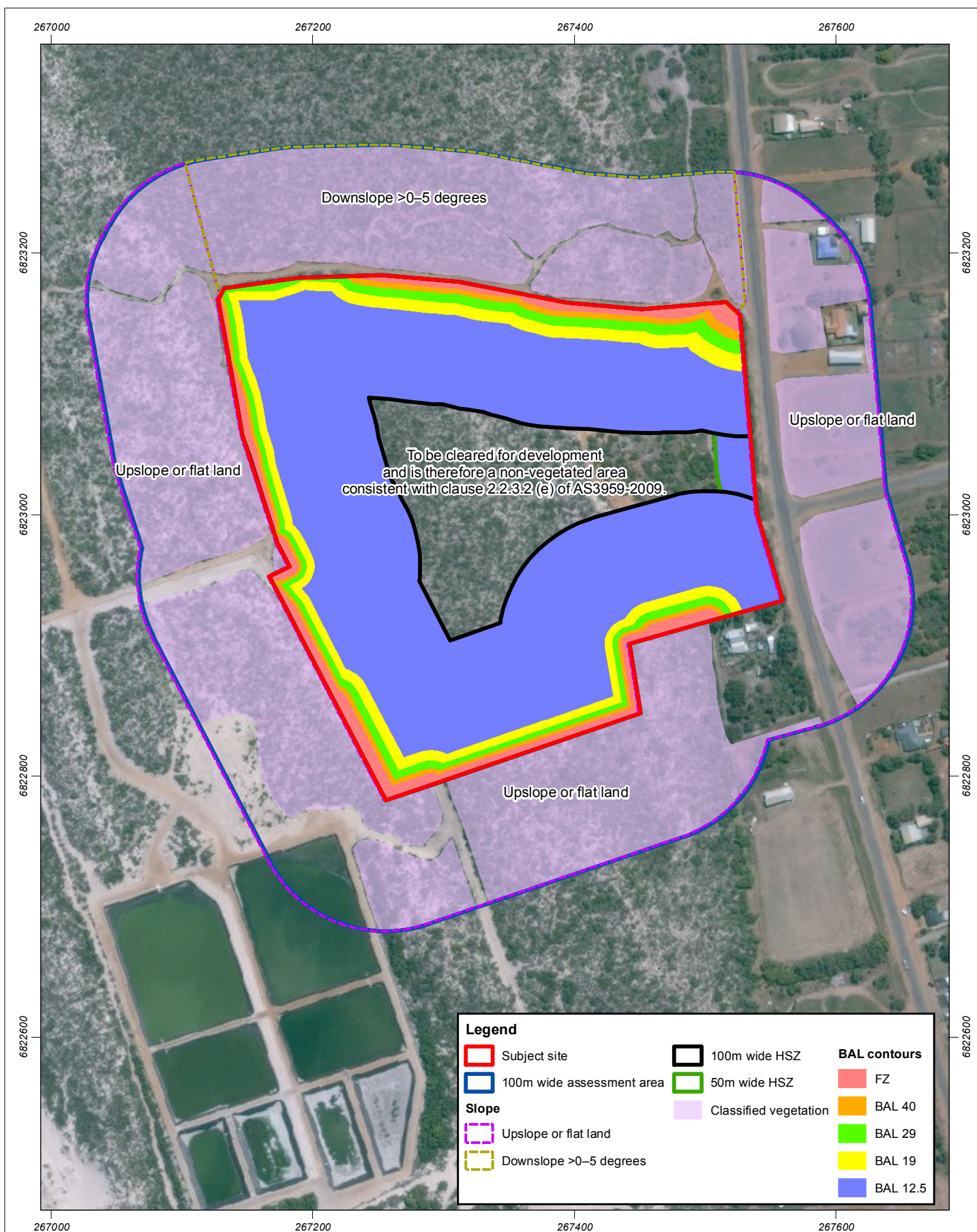
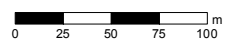


Figure 2: BAL contour assessment

Scale 1:3,947 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 20/07/2016

Author: JCrute

Source: Aerial image: ESRI online, approx. 2014.

Path: Q:\Consult\2015\GPA\GPA15164\ArcMap_documents\M001\RevA\GPA15164_01_M001_RevA_F002.mxd

strategen
 ENVIRONMENTAL

info@strategen.com.au
 www.strategen.com.au

Conclusions and recommendations

Strategen has undertaken a bushfire hazard level and BAL contour assessment for Lot 55 Chapman Road, Geraldton. These assessments have been undertaken in accordance with the Guidelines, the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016) and AS 3959–2009. The assessments and recommendation of increased building construction standards (i.e. BALs) responds to the bushfire risk imposed by classified vegetation to the north, south, east and west of the Site in accordance with SPP 3.7 requirements.

BALs and increased building construction standards for the Site are recommended as described in Table 1 and depicted in Figure 2:

The final BALs for any proposed buildings on the Site will be determined once the location and design of future buildings are confirmed. The BMP provided at the development application stage will detail these findings.

The recommended heightened building construction standards (i.e. BALs) will ensure the affected development is built to the engineering and materiality specifications appropriate to the level of bushfire attack that may be received at the building interface. It is expected that the proposed commercial development will meet the intent of SPP3.7 through ensuring adequate separation from bushfire hazards in conjunction with the implementation of heightened construction standards applied to future buildings.

References

- Department of Fire and Emergency Services (DFES) 2016, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from:
<http://www.dfes.wa.gov.au/regulationandcompliance/bushfireproneareas/Pages/default.aspx>, [1 June 2016].
- Department of Planning (DoP) 2016, *Visual guide for bushfire risk assessment in Western Australia*, Department of Planning, Perth, WA.
- Standards Australia (SA) 2009, *Australian Standard AS 3959–2009 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.
- Western Australian Planning Commission (WAPC) 2015a, *State Planning Policy 3.7 Planning in Bushfire-Prone Areas*, Western Australian Planning Commission, Perth.
- Western Australian Planning Commission (WAPC) 2015b, *Guidelines for Planning in Bushfire-Prone Areas*, Western Australian Planning Commission, Perth.