

STRUCTURE PLAN AMENDMENT No. 1

Treendale South Structure Plan



PREPARED FOR MAMMOTH CONTRACTING ATF

DOCUMENT CONTROL

ISSUE	DATE	ISSUE DETAILS	AUTHOR	CHECKED	APPROVED
Orig	09.08.2018	Client Review	AR	GB	GB
Rev 2	17.04.2018	Shire revisions	GB	GB	GB
Rev 3	22.01.2019	BDCA Comments	KS	KS	KS
Rev 4	28.03.2019	WAPC - Modifications	KS	KS	KS

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Contents

EXECUTIVE SUMMARY	3
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PART 1 - IMPLEMENTATION

1.1	Structure Plan Area and Application of Structure Plan.....	5
1.2	Operation	5
1.3	Staging.....	5
1.4	Subdivision and Development Requirements.....	5

PART 2 - EXPLANATORY REPORT

1	Introduction	10
1.1	Subject Site.....	10
2	Statutory Context	11
2.1	Greater Bunbury Region Scheme and Shire of Harvey District Planning Scheme No.1	11
2.2	Treendale South Structure Plan.....	11
2.3	Subdivision Approvals.....	11
2.4	Liveable Neighbourhoods	11
3	Proposed Development Concept	14
3.1	Bushfire Management Plan.....	14
3.2	Public Open Space	14
3.3	Environmental Management	15
3.4	Residential	15
3.5	Commercial	15
3.6	Movement Network	15
3.7	Infrastructure Coordination, Servicing and Staging.....	15
4	Conclusion	16

Figures

Structure Plan Map	8
Figure 1 – Location Plan	10
Figure 2 – Scheme Maps	12
Figure 3 – Existing Structure Plan	13

Appendices

Appendix A	Bushfire Management Plan
Appendix B	Staging Plan

This structure plan is prepared under the provisions of the Shire of Harvey District Planning Scheme No. 1.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

22 February 2010

In accordance with Schedule 2, Part 4, Clause 28 (2) and refer to Part 1, 2. (b) of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

Date of Expiry: 19 October 2025

Table of Amendments

Amendment No.	Summary of the Amendment	Amendment Type	Date approved by the WAPC
1	<ul style="list-style-type: none"> • Replace the former school site and Community Purposes site with 'Residential - R20'; • Relocate the Local Centre (Commercial) cell adjacent to the Collie River bridge (fronting The Boulevard) and increase the land area by 0.28 ha to 0.77 ha; • Reconfigure the central POS site (POS C) to protect threatened fauna habitat trees; • Relocate the Community Purposes site to the central POS site (POS C); • Replace portion of the POS site near the Forrest Highway Landscape Buffer (POS F) with 'Residential - R40'; • Reconfigure and increase the Collie River foreshore reserve/POS by 0.9432 ha to 7.6932 ha to provide a 'low-threat' vegetation area adjacent to residential lots for bushfire protection and to protect threatened fauna habitat trees; • Designate 'Residential-R40' cells around the relocated Local Centre and the Collie River foreshore and 'Residential-R30' cells adjacent to 'The Boulevard', the relocated POS C and R40 sites; • Restructure the road layout east of The Boulevard providing free-flowing north-south routes (extension of Jupiter Drive) and staggered east-west routes; and • Provide for appropriate access arrangements for lots fronting The Boulevard. 	Major	5 April 2019

EXECUTIVE SUMMARY

This report proposes an Amendment to the Treendale South Structure Plan, within the Shire of Harvey.

The Structure Plan Amendment involves changing the road layout and development cells on the land east of The Boulevard in order to meet contemporary bushfire protection policy and provide a more regular road layout. Residential densities throughout the subject area remain largely unchanged.

In addition, a review of the most appropriate location of the commercial and public purpose sites have been undertaken in conjunction with the Shire of Harvey. It is proposed that these areas be re-located to the higher amenity location adjoining the Collie River to provide a greater community benefit to users of the new path network that has been implemented in conjunction with the completion of the new bridge.

This Structure Plan Amendment has been prepared in accordance with Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Deemed Provisions) and the Western Australian Planning Commission's Structure Plan Framework.

Summary Table

Item	Data
Total area covered by the structure plan	59.00ha
Area of Residential land use proposed	30.5662ha
Total estimated lot yield	852
Estimated number of dwellings	852
Estimated residential site density	R20 20.0667ha 223 dwellings R30 5.5478ha 184 dwellings R40 4.9099ha 223 dwellings
Estimated population	2130
Number of high schools	0
Number of primary schools	0
Local centre site	0.77ha
Estimated commercial floor space	300m ²
Community purpose site	0.2861ha
Estimated area and percentage of public open space given over to:	
• Restricted open space	POS Area A 1.8121ha POS Area E 2.1452ha TOTAL 3.9573ha
• Neighbourhood Parks	POS Area D 1.8450ha TOTAL 1.8450ha
• Local Parks	POS Area B 1.8909ha POS Area C 1.2067ha TOTAL 3.3911ha
Estimated percentage of natural area	15.5%

PART 1 – Implementation

1.1 Structure Plan Area and Application of Structure Plan

The Structure Plan area is represented by the area identified on the Structure Plan map. Residential, community and commercial lots shall be developed in accordance with the requirements of the 'Residential Development' zone or as required under the relevant local planning scheme (as amended) with due regard being given to the provisions of the structure plan and local development plan.

1.2 Operation

Treendale South Structure Plan (as amended) is valid until 25 August 2025.

1.3 Staging

The staging of subdivision is to be consistent with the Staging Plan – see *Appendix B*.

1.4 Subdivision and Development Requirements

The Structure Plan provides a basis for zoning and subdivision of land and will be given due regard when determining applications within the Structure Plan area, including consideration of the objectives and requirements of the Scheme zones proposed by the Structure Plan. The Structure Plan Map outlines the applicable land uses and sets out the Planning Policy Statements and other requirements.

Planning Policy Statements

This Local Structure Plan (LSP) provides a framework for future subdivision and development of the land. Actual subdivision may vary from the Structure Plan, and requires approval from the Western Australian Planning Commission.

Subdivision and Development Requirements

1. The ceding of Public Open Space shall be carried out in accordance with the Staging Plan at Attachment 1. Subdivision will not be approved by the WAPC until such time as a management authority has been identified and has agreed to manage the open space which is to be ceded for the corresponding stage of subdivision for which approval is sought.
2. A noise attenuation bund is to be constructed within the identified reserve at such a time as identified by the approved Staging Plan, so as to ensure that no lots are created which would be subject to unacceptable noise impacts. The construction of the bund and any other necessary noise mitigation measures are to be in accordance with State Planning Policy No. 5.4 to the satisfaction of Main Roads WA.
3. Subdivision clearance, to any subdivision approval which may be issued, will not be granted by the Shire and the WAPC, until such time as the proposed roads can be connected to the wider road network, via the connections shown on the Structure Plan.
4. A landscaping plan is to be prepared and implemented for each stage of the subdivision inclusive of the noise bund.
5. Prior to lodgement of a subdivision application within Stages 3, 4 and 5, the Bushfire Management Plan (Ref:17-064 Version C 'Planning in Bushfire prone areas May 2018) is to be modified to contain:
 - an updated structure plan;
 - an updated vegetation classification mapping showing the protection of threatened fauna habitat trees;
 - written confirmation from the Shire of Harvey confirming the Shire will manage future public open space/foreshore reserves in perpetuity where vegetation classifications are identified as 'low threat';
 - an updated BAL Contour Plan with regard to the aforementioned; and

- a letter of approval by the Department of Fire and Emergency Services.
6. A Foreshore Management Plan is to be prepared and implemented to the satisfaction of the Shire of Harvey and Department of Water and Environmental Regulation.
 7. Prior to the commencement of subdivision a Local Development Plan shall be prepared which satisfies the following requirements:
 - a) Development to address the adjoining foreshore areas;
 - b) Boundary fencing to be designed to enable passive surveillance of the adjoining foreshore reserve and public access ways where applicable;
 - c) Maximum building heights of three storey's as defined by the Residential Design Codes; and
 - d) Cut and fill not to exceed 1 metre.
 8. Pedestrian pathways are to be constructed by the subdivider in the locations shown on the Structure Plan and to the specifications of the Shire of Harvey. Pathways within the Collie River foreshore area are to be located and constructed so as to minimize disruption to fringing vegetation.
 9. Change-rooms, toilet facilities and carparking are to be constructed by the subdivider in conjunction with the development of Public Open Space area 'D' to the satisfaction of the Shire of Harvey and the Department of Water and Environmental Regulation.
 10. An Urban Water Management Plan, consistent with an approved Local Water Management Strategy is to be prepared and implemented for each stage of the subdivision.
 11. Developer contributions are to be made by the subdivider as required by the Shire of Harvey and Shire of Dardanup Joint Town Planning Scheme No. 1.
 12. All lots are to be connected to be connected to water and sewer, underground power, reticulated gas and telecommunications.
 13. A Sustainability Outcomes and Implementation Plan is to be prepared, which details the targets and method of delivery in respect to 'sustainability outcomes' inclusive of:
 - on-site power generation;
 - efficient use of power and water;
 - on-site water capture and re-use;
 - re-use of grey water; and
 - correct housing orientation for passive heating and cooling
 14. Lots located within the central cells of Stage 5 (refer Attachment 1) to have wider frontages to increase opportunities for solar access.
 15. Location of significant trees in relation to development to be confirmed at time of subdivision.

Development Requirements

16. Development within the Local Centre cell is limited to a maximum shop/retail floorspace of 300m² nla.
17. Prior to the lodgement of an application to create the lot(s) for the Local Centre cell, a Local Development Plan (LDP) is to be prepared in accordance with the Planning and Development (Local Planning Schemes) Regulations 2015 and approved by the local government. The LDP is to address:

- a) Active street frontages: Development designed to have a minimal or no setback from the street, with building facades incorporating glazing and openings which enable direct contact (visual and physical) between the street and the interior of the adjoining building;
 - b) Pedestrian amenity: Building awnings over footpaths to provide all weather protection;
 - c) Pedestrian scale development: As outlined above building heights limited to 2 to 3 storeys in order to not "overwhelm" or excessively overshadow adjoining public spaces; and
 - d) Vehicle parking areas: "tucked in" or located behind buildings which are not primarily visible from the adjoining streets.
18. Discretionary land uses within the Local Centre cell are to be determined by the local government to be consistent with the amenity (i.e. noise, traffic) standards of the area. Residential (R40) may be supported in a multiple dwelling/multiple storey building only.
19. No direct vehicular access to Forrest Highway. Direct access is also prohibited to 'The Boulevard' carriageway except via service roads or as determined by a Transport Impact Statement.
20. Traffic noise attenuation is to be investigated at the subdivision stage for the lots abutting The Boulevard.



LEGEND

- EXISTING CADASTRAL BOUNDARIES
- EXISTING STRUCTURE PLAN BOUNDARY (TOTAL AREA = 50.00ha)
- PROPOSED CADASTRAL BOUNDARIES
- PROPOSED AMENDMENT BOUNDARY
- CONSERVATION CATEGORY WETLAND
- WETLAND 50 METRE BUFFER
- PROPOSED LOCATION OF SEWER PUMP STATION
- LAND USE
 - RESIDENTIAL - R20
 - RESIDENTIAL - R30
 - RESIDENTIAL - R40
 - LOCAL CENTRE
 - PUBLIC PURPOSE - COMMUNITY FACILITY
 - PUBLIC OPEN SPACE
 - LANDSCAPE BUFFER
- LOCAL ROAD
- LANEWAY
- SERVICE LANES
- INDICATIVE SITE FOR CAR PARKING
- PATHWAY - SHARED PATH
- TREES TO BE RETAINED (DEVELOPER COMMITMENT)
 - Eucalyptus Rud (Rhodes Gum)
 - Corymbia calophylla (Marr)
- OTHER TREES TO BE RETAINED IN POS
 - Corymbia calophylla (Marr)

STRUCTURE PLAN AMENDMENT No.1 South Treendale, Harvey

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Plan No: 17-001886P-SP-02E

Date: 28.03.2019
Rev: E
Scale: A1 @12500, A3 @ 1:5000
Co-ords: MGA
Author: N/A



PART 2 – EXPLANATORY REPORT

1 Introduction

This report has been prepared by Calibre on behalf of Mammoth Contracting ATF. It forms the basis of a formal request to the Shire of Harvey to amend the Treendale South Structure Plan to redesign and subsequently recode land east of the The Boulevard to provide an alternative lot mix and relocate the Public Open Space area to better manage bushfire risk. The Commercial and Public Purpose sites are also proposed to be relocated to a more suitable location.

The following report addresses the proposed modification to the Structure Plan, and describes the statutory planning context of the Structure Plan modification.

1.1 Subject Site

The subject site is located on the northern side of the Collie River, approximately 2.5 kilometres east of the Australind town centre. The total area of the subdivision is 31.2 hectares (see *Figure 1 – Location Plan*). The property has been used primarily for agricultural purposes, predominately livestock grazing.

Surrounding landuses include the adjoining Treendale Estate to the North and the Australind Bypass to the immediate east.

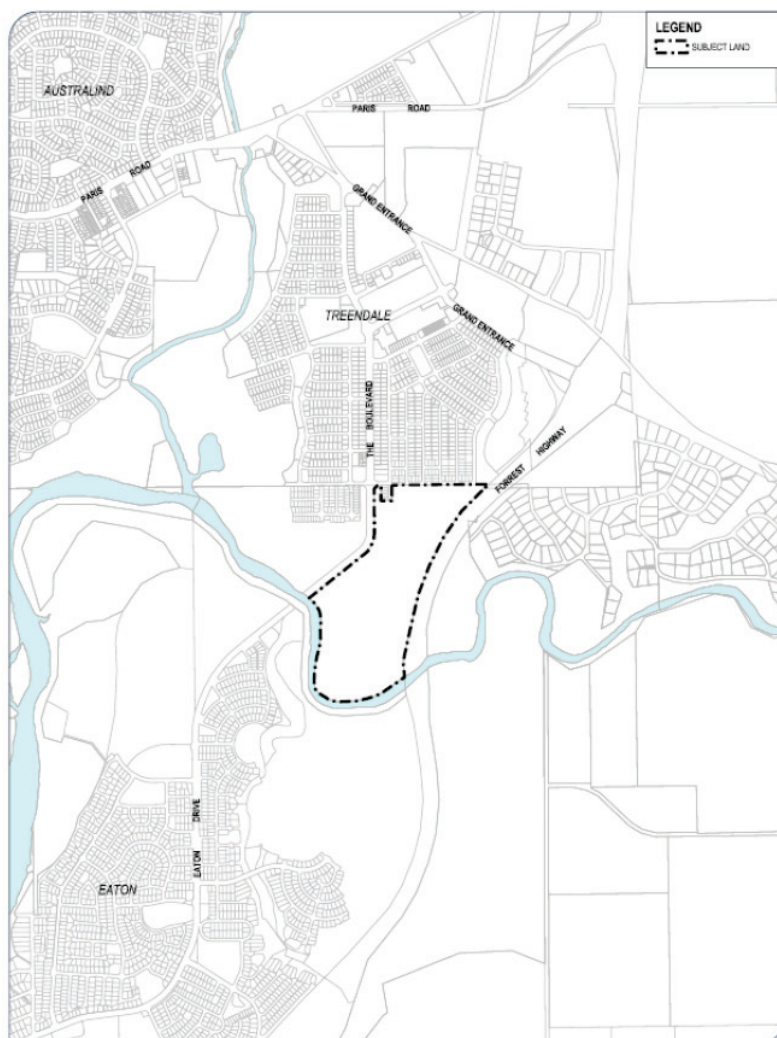


Figure 1 – Location Plan

2 Statutory Context

2.1 Greater Bunbury Region Scheme and Shire of Harvey District Planning Scheme No.1

The subject site is zoned Urban under the Greater Bunbury Region Scheme (GBRS) and Residential Development under the Shire of Harvey District Planning Scheme No.1 (DPS 1). *Figure 2* shows the relevant Scheme maps.

2.2 Treendale South Structure Plan

The latest revision to the Treendale Structure Plan was adopted by the Shire of Harvey in February 2010. The Structure Plan covers land generally bound by the Australind Bypass to the east, the Collie River to the South and West and the existing Treendale Estate to the North. The site subject to this Structure Plan Amendment is the land located to the east of The Boulevard, Treendale.

The main drivers behind the redesign of this portion of the Treendale South Structure Plan have been due to, firstly, The Department of Education advising that a second Primary School site was not required for the Treendale Estate, and secondly, the Bushfire investigations identifying that larger buffers would be required predominantly around the southern portion of the development. This therefore required the area of Public Open Space to be increased in this area to accommodate these buffers and the need to redesign.

Due to these major modifications being needed, it seemed timely to modify the residential and commercial layout to accommodate the above impediments and also to update the design to conform with the current market demand for residential development and Liveable Neighbourhoods Policy.

The urban development coding is of a similar nature to what was originally approved with a mixture of R20 and R30.

Figure 3 shows the existing Structure Plan.

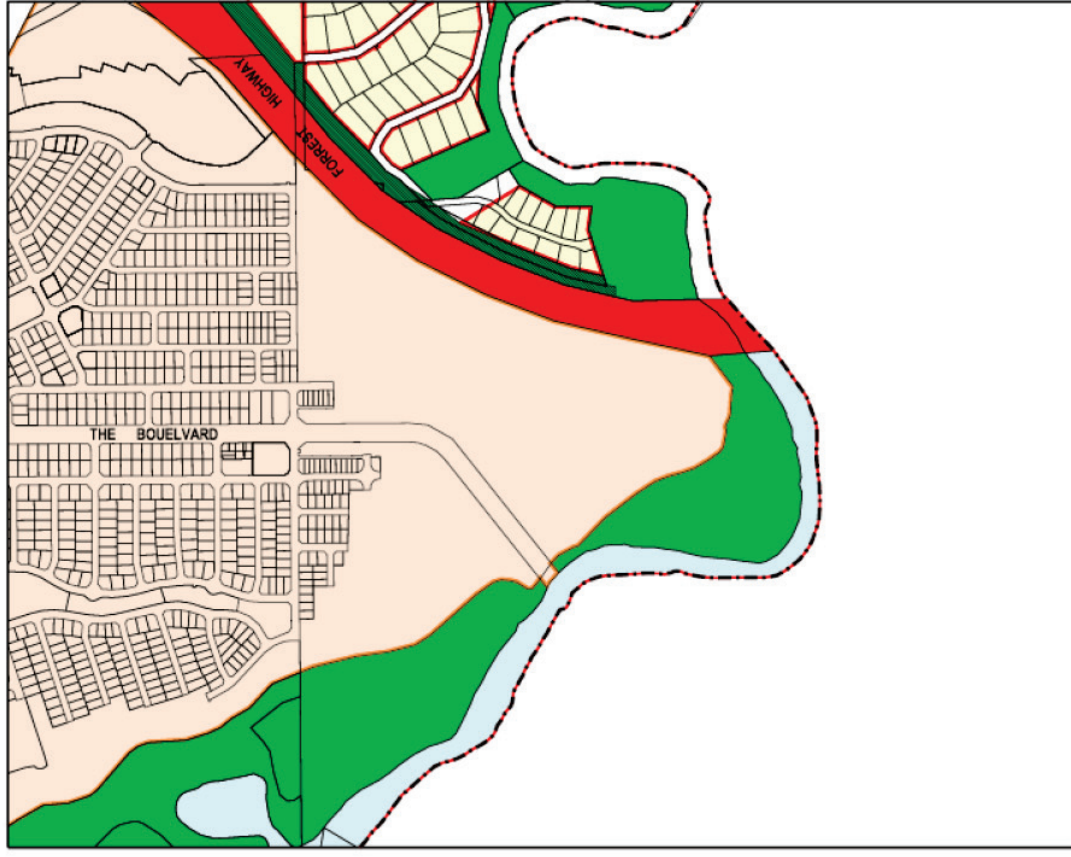
2.3 Subdivision Approvals

Since the approval of the latest revision of the Treendale South Structure Plan in 2010, a number of subdivision applications have been approved over the Estate with the land to the west of The Boulevard being either developed or being constructed for residential purposes.

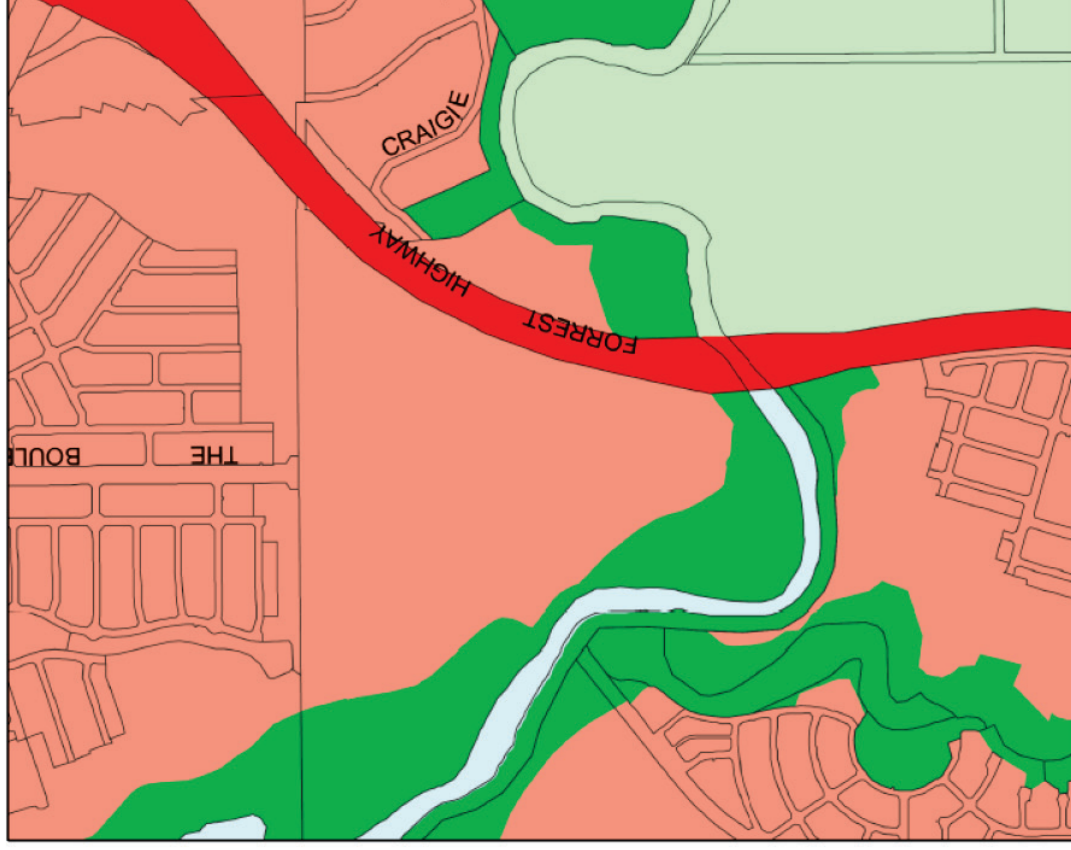
The entire Structure Plan area has gained subdivision approval, though the area subject to this Amendment are yet to be developed.

2.4 Liveable Neighbourhoods

Liveable Neighbourhoods is the Western Australian Planning Commission's operational policy prepared to implement the objectives of the State Planning Strategy, which aims to guide the sustainable development of Western Australia in to the future. Liveable Neighbourhoods is used for the design and assessment of structure plans and subdivision for new areas in the metropolitan area and country centres. It incorporates many of the development control policies relating to structure planning and subdivision. Liveable Neighbourhoods is to be followed in the design and approval of urban development. While the Treendale South Structure Plan has evolved over the course of implementation of Liveable Neighbourhoods, it nevertheless reflects many elements contained within the policy and in particular promotes diversity of housing density and product. The redesign of the subject site is consistent with the overarching aims and goals of Liveable Neighbourhoods.



TOWN PLANNING SCHEME No. 1



GREATER BUNBURY REGION SCHEME

Figure 2 – Scheme Maps

SUPERSEDED



Figure 3 – Existing Structure Plan

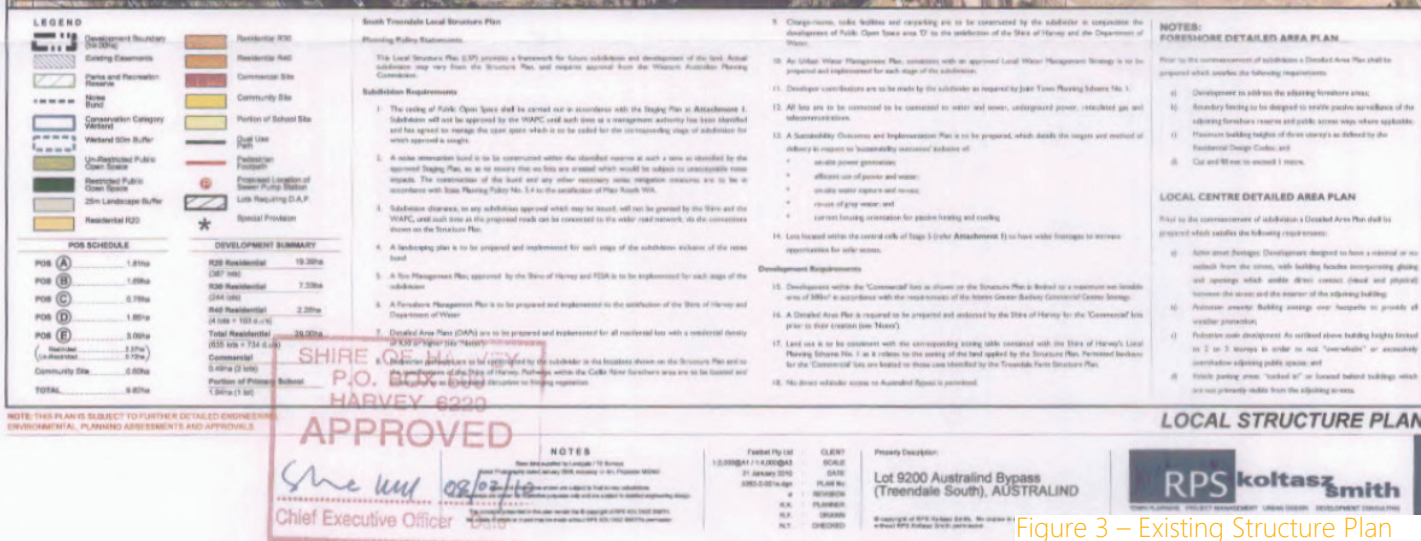


Figure 3 – Existing Structure Plan

3 Proposed Development Concept

The proposed Structure Plan Amendment will facilitate the subdivision of the subject site into green title lots approximately 300-500m² in area, adhering to the proposed R20 and R30 Residential coding. Proposed lots will conform to the provisions of the Residential Design Codes, and can be subject to detailed area plans as prescribed by the approved Structure Plan.

The ratio of residential lots coded R20 and R30 is considerably the same, the modified design provides for a variety of housing product reflective of the current market and is a response to the modifications made and relocation of the areas of POS.

3.1 Bushfire Management Plan

The Western Australian Planning Commission issued subdivision approval 150466 in October 2014 for the whole of the Treendale South Estate and a bushfire management plan (Lushfire 2016) was subsequently approved for this. The current proposal is a redesign of the eastern portion of the Estate.

The most significant bushfire hazards associated with the development will be:

- The Regional Open Space and associated revegetation along the river foreshore; and
- The provision of a landscaped noise bund adjacent to the existing vegetation along Forrest Highway

The subdivision design provides for external boundary road reserves 18m wide separating the development from the hazard areas. The Regional Open Space vegetation on the foreshore and embankment will also be separated from the development by an additional linear Local Open Space which will be maintain as low threat vegetation. The precedent for this design approach has already been established in the previous stages of the development and the adjacent Treendale Estate.

All of the proposed lots will have a Bushfire Attack Level of BAL-29 rating or less. The majority of lots in the Estate will have aBAL-12.5 or BAL-Low rating.

The proposed subdivision complies with the objectives of State Planning Policy 3.7 as:

1. It avoids any increase in the threat of bushfire to people, property and infrastructure;
2. It reduces vulnerability to bushfire through the identification and consideration of bushfire risks in the design of the development and the decision-making process;
3. The design of the subdivision and the development takes into account bushfire protection requirements and includes specific bushfire protection measures; and
4. Achieves an appropriate balance between bushfire risk management measures and biodiversity, conservation values, and environmental protection.

A full copy of the revised Bushfire Management Plan for Lot 9501 The Boulevard, Treendale South is located at *Appendix A*.

3.2 Public Open Space

The Treendale South Structure Plan area features good quality and quantity public open space, with at least 10 per cent of the subdivisible area set aside as public open space in accordance with Liveable Neighbourhoods requirements. The Structure Plan Amendment does not generate the need for additional public open space, given there is no increase in the residential development potential of the site. Notwithstanding this, the Amendment seeks to reconfigure the public open space areas to adequately manage the bushfire risk, particularly in the Southern River Foreshore area. In addition, the balance of POS is located in a large central area to ensure its useability. The overall POS contribution remains consistent with the original plan.

3.3 Environmental Management

As a condition of subdivision approval gained previously for the overall development site, an Environmental Management Plan (EMP) was undertaken. The objectives of the EMP are to:

- Provide guidance to ensure the protection and management of Black Cockatoo and Western Ringtail Possum (WRP) populations and their habitat during pre-construction, construction and post-construction in the Project;
- Minimise the overall impact of the Project upon the Western Ringtail Possum population and Black Cockatoos; and
- Wherever possible, take action to enhance long term fauna habitat in the Project Area.

During the WRP habitat assessment no signs of the WRP were observed in the Project Area.

Although no Black Cockatoo species were directly observed, the EMP identified a number of possible breeding trees that were recommended be retained.

This amendment to the structure plan considers, by the way redesign and location of the central POS and southern river foreshore area, the retention of significant trees as identified in the EMP and in consultation with the Department of Biodiversity, Conservation and Attractions. The exact location of the trees to be retained in relation to development, as shown on the Structure Plan Map, are to be confirmed at time of subdivision.

3.4 Residential

There has been a minor modification to the depths of the residential cells to enable the delivery of contemporary lot products with a depth of cell generally of 60m. The majority of the area is proposed as R20 density with R30 development proposed in areas consistent with the original plan in areas around POS and in close proximity to the Commercial and Community areas. The number of grouped residential sites has been reduced to 1.

3.5 Commercial

The existing structure plan included a 0.5ha commercial area and 0.6ha public purpose site adjacent to a primary school. With the removal of the primary school and the opening of the bridge over the Collie River presents an opportunity to relocate these sites adjacent to the Collie River and the higher density sites north of the Boulevard.

The proposed commercial site directly fronts the river foreshore while being provided with high exposure from the new bridge. This location will be far more likely to attract commercial tenancies and provides opportunities for mixed use development.

3.6 Movement Network

The road layout within the Amendment area has been modified to accommodate the reconfiguration of the POS areas and provide regular residential cells consistent with contemporary planning practice and standard building product. The main access points onto The Boulevard, together with the perimeter road and connection to the surrounding road network remains the same as the original Structure Plan.

3.7 Infrastructure Coordination, Servicing and Staging

All relevant infrastructure and services are in place and available to facilitate the development of the subject site. Staging of development is unknown, but it is likely the site will develop generally in a North to South direction.

4 Conclusion

The modification to the Treendale South Structure Plan is deemed consistent with the goals and aspirations of the State and relevant Shire of Harvey Policies, as well as proper and orderly planning. The proposed Structure Plan Amendment seeks to modify the Treendale South Local Structure Plan by removing the Primary School Site, increasing the southern portion of Public Open Space and relocation of the commercial and public purpose sites, which in turn led to a redesign of the portion of Treendale South east of The Boulevard.

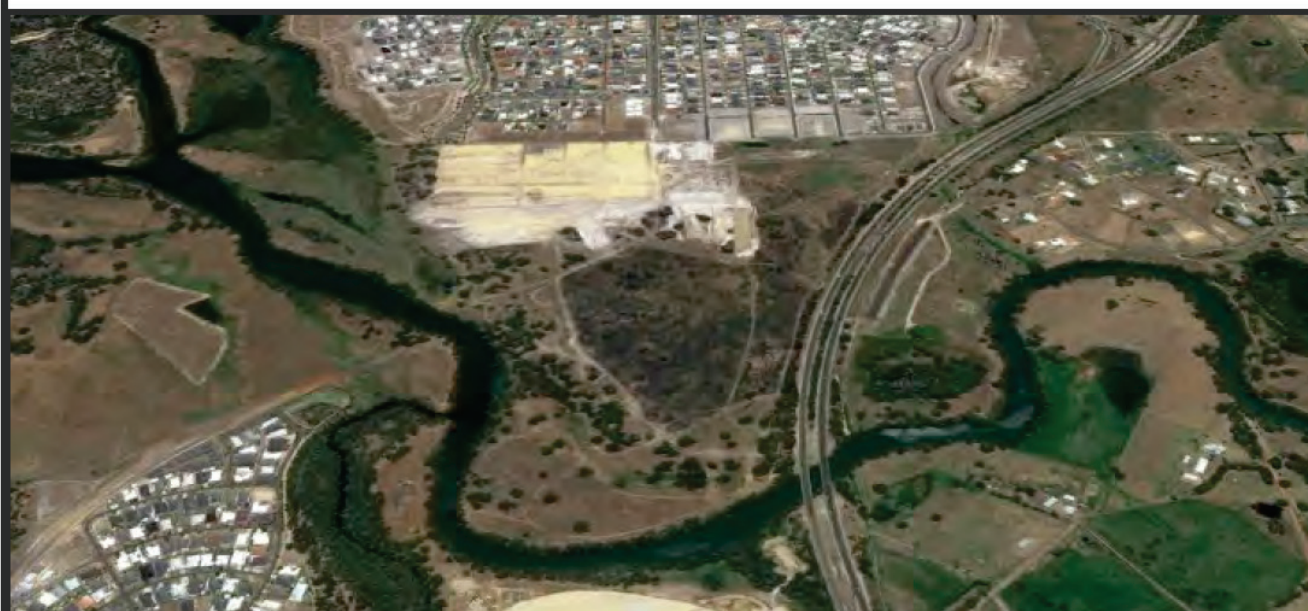
On the basis of the information presented, it is requested that the Shire amend the Treendale South Structure Plan to reflect this change.

Appendix A Bushfire Management Plan



Bushfire Management Plan (BAL Contour Plan)

Lot 9501 The Boulevard South Treendale



LUSH FIRE & PLANNING

PO Box 114
Woodanilling WA 6316
0418 954 873
ABN 74 232 678 543



Ref 17-064
Ver C
May 2018

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference:	Lot 9501 The Boulevard		
Suburb:	South Treendale	State:	WA
P/code:	6233		
Local government area:	Harvey		
Description of the planning proposal:	Structure plan for residential development		
BMP Plan / Reference Number:	17-064	Version:	C
Date of Issue:	18/05/2018		
Client / Business Name:	Fastbet Investments Pty Ltd		

Reason for referral to DFES	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 BPC elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input checked="" type="checkbox"/>	<input 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"/>

If the development is a special development as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Proposed structure plan modifications

Note: The decision maker (e.g. the local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Geoffrey Lush	Level 2	BPAD 27682	28/02/2019
Company	Contact No.		
Lush Fire & Planning	0418 954 873		

I declare that the information provided in this bushfire management plan is to the best of my knowledge true and correct.

Signature of Practitioner



Date

18/05/2018

This bushfire management plan is prepared for the proposed subdivision and development of the eastern portion of the Riverside Estate located at Treendale South.

The Western Australian Planning Commission (WAPC) issued subdivision approval 150466 in October 2014 for the whole of the estate and a bushfire management plan (Lushfire 2016) was subsequently approved for this. The current proposal is a redesign of the eastern portion of the Estate.

The aim of this Report is to reduce the threat to the residents in the proposed subdivision in the event of a bushfire within or adjacent to the development. It demonstrates:

- How the hazard level will be reduced and maintained for the life of the development.
- That compliance with the Bushfire Protection Criteria in the Guidelines can be achieved.

The subject land is located approximately 10km east-north-east of the Bunbury CBD adjacent to the Collie River. It is situated between the extension of The Boulevard and Forrest Highway. The subject land has an area of an area of 46.277 hectares. Its main topographical feature is the flood plain associated with the Collie River with a steep embankment separating this from the upland development area.

The development site has an area of 31.23 hectares and is predominantly cleared with some small groups of trees. The principal areas of remnant vegetation are restricted to parts of the embankment, river foreshore and linear area of re-vegetation adjacent to the Forrest Highway.

The proposed development will provide 440 lots ranging in size from 350m² (R30) to 630m² (R20) and a group house lot of 2179m². The development also includes a community purpose site, commercial land, local and regional open space. The Boulevard is currently being extended across the Collie River and will connect into Eaton Drive.

The most significant bushfire hazards associated with the development will be:

- The Regional Open Space and associated revegetation along the river foreshore; and
- The provision of a landscaped noise bund adjacent to the existing vegetation along Forrest Highway.

The subdivision design provides for external boundary road reserves 18m wide separating the development from the hazard areas. The Regional Open Space vegetation on the foreshore and embankment will also be separated from the development by an additional linear Local Open Space which will be maintained as low threat vegetation. The precedent for this design approach has already been established in the previous stages of the development and the adjacent Treendale Estate.

All of the proposed lots will have a Bushfire Attack Level of BAL-29 rating or less. The majority of lots in the Estate will have a BAL-12.5 or BAL-Low rating.

The proposed subdivision complies with the objectives of State Planning Policy 3.7 as:

1. It avoids any increase in the threat of bushfire to people, property and infrastructure.
Development with a maximum BAL-29 rating it does not increase the threat of bushfire. The proposed subdivision design does not increase the bushfire threat as it complies with the Bushfire Protection Criteria and provides for the management of vegetation hazards, suitable road access and appropriate separation distances with all proposed lots having a BAL-29 rating or lower.

2. It reduces vulnerability to bushfire through the identification and consideration of bushfire risks in the design of the development and the decision-making process.

The bushfire hazard and risks have been identified and assessed in this report.

3. The design of the subdivision and the development takes into account bushfire protection requirements and includes specific bushfire protection measures.

The proposed development complies with the Bushfire Protection Criteria.

4. Achieves an appropriate balance between bushfire risk management measures and biodiversity, conservation values, and environmental protection.

The vegetation on the site which is to be cleared for any development does not have any significant conservation value. The river foreshore and wetlands will be rehabilitated and provision for this has been included in the design and assessment.

The recommendations in this report should not be construed to assure total bush fire protection and do not guarantee that a building will not be damaged in a bush fire. The severity of a bush fire will depend upon the vegetation fuel loadings; the prevailing weather conditions and the implementation of appropriate fire management measures.

Document Reference

Property Details

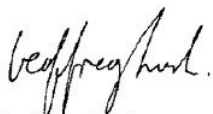
Street No	Lot No's	Plan	Street Name
	9501	409841	The Boulevard
Locality	Treendale	State WA	Postcode 6233
Local Government Area	Harvey		
Description of the building or works	Residential subdivision		

Report Details

Revision	Date	Job No 17-064
A	29/01/2018	Preliminary
B	07/02/2018	Final
C	18/05/2018	Revised structure plan design

Practitioner Details

BPAD	Level 2 Practitioner	Accreditation No	27682
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18 May 2018
geoffrey@lushfire.com.au



Disclaimer

The measures contained in this report do not guarantee that a building will not be damaged in a bushfire. The ultimate level of protection will be dependent upon the design and construction of the dwelling and the level of fire preparedness and maintenance under taken by the landowner. The severity of a bushfire will depend upon the vegetation fuel loadings; the prevailing weather conditions and the implementation of appropriate fire management measures.

CONTENTS

1.0	Proposal Details	1
1.1	Introduction	1
1.2	Existing Conditions.....	1
1.3	Bushfire Prone Land.....	4
1.4	Firebreak Order	4
1.5	Proposed Development	4
2.0	Environmental Considerations.....	8
2.1	Native Vegetation Modification and Clearing.....	8
2.2	Re-vegetation / Landscape Plans.....	8
3.0	Bushfire Assessment Results	10
3.1	Assessment Inputs.....	10
3.1.1	Existing Vegetation Classifications	10
3.2	Assessment Outputs	17
3.2.1	BAL Contour Map.....	17
4.0	Identification of Bushfire Hazard Issues.....	23
4.1	Locality.....	23
4.2	Development Interface.....	23
4.3	Local Open Space	23
5.0	Assessment Against the Bushfire Protection Criteria.....	24
5.1	Compliance Table	24
5.2	Additional Management Strategies.....	27
5.2.1	Purchaser Advice	27
5.2.2	Staging	27
6.0	Responsibilities for Implementation and Management of the Bushfire Measures.....	28
7.0	References.....	29
8.0	Appendices	30

FIGURES

Figure 1	Location and Context	2
Figure 2	Existing Conditions.....	3
Figure 3	Bushfire Prone Land.....	6
Figure 4	Structure Plan.....	7
Figure 5	Vegetation Modification	9
Figure 6	Vegetation Classifications	11
Figure 7	Modified Vegetation Classifications	19
Figure 8	BAL Contour Map.....	20
Figure 9	Fire Mitigation Measures.....	26

TABLES

Table 1 Existing Vegetation Classifications	10
Table 2 Modified Vegetation Plots	17
Table 3 Lot BAL Classifications	21
Table 4 Bushfire Protection Criteria	24
Table 5 Implementation	28

APPENDICES

Appendix 1.....	Existing BMP
Appendix 2.....	Landscape Bund
Appendix 3	Local Open Space Plans

1.0 PROPOSAL DETAILS

1.1 Introduction

This bushfire management plan is prepared for the proposed subdivision and development of the Riverside Estate located at Treendale South.

The subject land is located approximately 10km east-north-east of the Bunbury CBD adjacent to the Collie River as shown in Figure 1. It is situated between the extension of The Boulevard and Forrest Highway.

The Western Australian Planning Commission (WAPC) issued subdivision approval 150466 in October 2014 for the whole of the estate and a bushfire management plan (Lushfire 2016) was subsequently prepared for this. This bushfire management plan is contained in Appendix 1 and the southern portion of the site is subject to a redesign of the subdivision and bushfire management plan.

The aim of this Report is to reduce the threat to the residents in the proposed subdivision in the event of a bushfire within or adjacent to the development. It defines the responsibilities of relevant stakeholders and the measures required to manage the potential likelihood of fires starting on the proposed lots or the adjoining land.

The Report also demonstrates:

- 1) How the hazard level will be reduced and maintained for the life of the development. This will enable the decision-maker to ensure that appropriate bushfire risk management measures are in place to achieve and maintain a low or moderate hazard level.
- 2) That compliance with the Bushfire Protection Criteria in the Guidelines can be achieved.

1.2 Existing Conditions

The existing conditions for the subject land are shown in Figure 2. The subject land is Lot 9501 DP409841 The Boulevard and it has an area of 46.277 hectares.

External access to the site and Treendale is provided from the Grand Entrance from either Paris Road or from the Forest Highway. The site is located at the southern end of The Boulevard which is the principal distributor road for the locality.

The site is vacant with frontage to the Collie River along its southern boundary. There is a large floodplain containing an alluvial terrace adjacent to the river. The eastern side of the site is defined by the adjoining Forest Highway. Treendale immediately to the north of the site is being developed for residential purposes and includes a District Shopping Centre.

The topography of the site is characterised by:

- An upland area which has an elevation of between 12 and 13m AHD which is generally flat with minor undulations;
- Low lying flood prone land associated with the river which has an elevation of approximately 1m AHD; and
- A steep sided embankment in the southern portion of the site separating the development area from the river flood plain.



LEGEND

SUBJECT LAND



MAIN ROAD



UNDER CONSTRUCTION



FIGURE 1
LOCATION AND CONTEXT



Job No 17-064

Rev A Description Preliminary

Date 03/01/2018



LEGEND

SUBJECT LAND - - - - -

FIGURE 2
EXISTING CONDITIONS



Job No 17-064
Rev Description
A Preliminary

Date
03/01/2018

The subject land is predominantly cleared with paddock grasses and weed species being dominant. The areas of remnant vegetation are restricted to parts of the embankment, river foreshore and there is a linear area of re-vegetation adjacent to the Forrest Highway. The principal species include Flooded Gum (*Eucalyptus rudis*); Marri (*Corymbia calophylla*); Jarrah (*E. marginata*), Swamp Paperbark (*Melaleuca raphiophylla*) and Peppermints (*Agonis flexuosa*).

1.3 Bushfire Prone Land

Portions of the subject land are shown on the Map of Bush Fire Prone Areas (Figure 3) as being bushfire prone. Bushfire prone areas are comprised of (1):

- Bushfire prone vegetation; and
- A 100m wide bushfire prone buffer.

The designation of bushfire prone areas triggers:

- The application of Australian Standard AS3959 Construction of Buildings in Bushfire Prone Areas under the Building Code of Australia;
- The provisions of the Planning and Development (Local Planning Schemes) Amendment Regulations 2015; and
- The application of SPP3.7 Planning in Bushfire Prone Areas.

1.4 Firebreak Order

Council's Firebreak Order stipulates that for any Residential, Commercial and Industrial land within a townsite or any other area subdivided for residential purposes that:

- (a) where the area of land is 2,024m² (approx. ½ acre) or less, remove all flammable material on the land except live standing trees, shrubs and plants, from the whole of the land;
- (b) where the area of land exceeds 2,024m² (approx. ½ acre) provide firebreaks of at least 2 metres wide and within 6 metres of the inside of all external boundaries of the land, cleared hardstand areas and reticulated grassed areas maintained in a green state maybe considered acceptable as an adequate firebreak.

1.5 Proposed Development

The proposed subdivision / development plan is shown in Figure 4 and the development portion of the site has an area of 31.23 hectares. There will be 440 lots ranging in size from 350m² (R30) to 630m² (R20) and a group house lot of 2179m². The development also includes a community purpose site, commercial land, local and regional open space.

The Boulevard is a 40m wide road reserve linking the Treendale locality to Eaton with a bridge over the Collie River currently being constructed. The internal subdivision roads are generally 15m wide with the boundary road being 18m wide.

There will be a 25m wide landscaping buffer provided along the eastern boundary adjacent to Forrest Highway. This will comprise of an 18m wide by 3m high landscaped earthen noise bund and a 9m wide vegetated swale drain. The plan of this is contained in Appendix 2.

There are three principal areas of local open space being as follows:

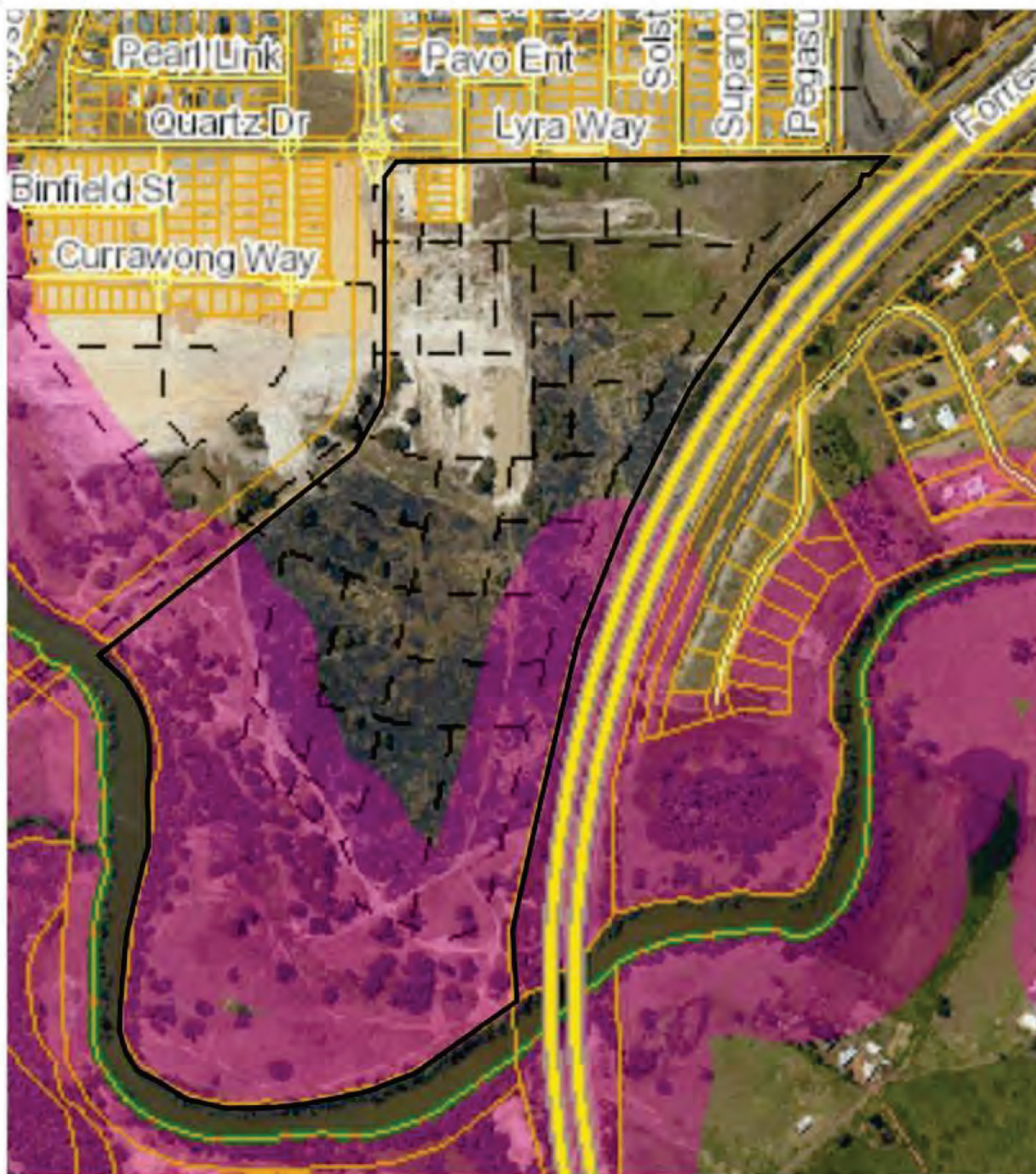
- Area F in the north eastern corner of the site having an area of approximately 0.2935ha;
- Area C in the middle of the site adjacent to the western boundary having an area of approximately 1.1877ha; and

1 DFES (2015) Mapping Standard for Bush Fire Prone Areas.

South Treendale Riverside

- Area B in the southern portion of the site adjacent to the Regional Open Space foreshore area and having an area of 1.7158ha.

The plan for the Regional Open Space foreshore area is included in Appendix 3..



LEGEND

SUBJECT LAND



BUSHFIRE PRONE LAND



FIGURE 3
BUSHFIRE PRONE LAND



Job No 17-064
Rev A Description Preliminary

Date 03/01/2018



FIGURE 4
STRUCTURE PLAN



Job No 17-064

Rev Description
A Preliminary
B Revised SP

Date
03/01/2018
15/05/2018

2.0 ENVIRONMENTAL CONSIDERATIONS

2.1 Native Vegetation Modification and Clearing

Some minor clearing within the development area will occur for the construction of the subdivision as shown in Figure 5.

2.2 Re-vegetation / Landscape Plans

Based upon the previous approved subdivision (WAPC Ref 105466), structure plan and the BMP for Stage 1, it is recognised that:

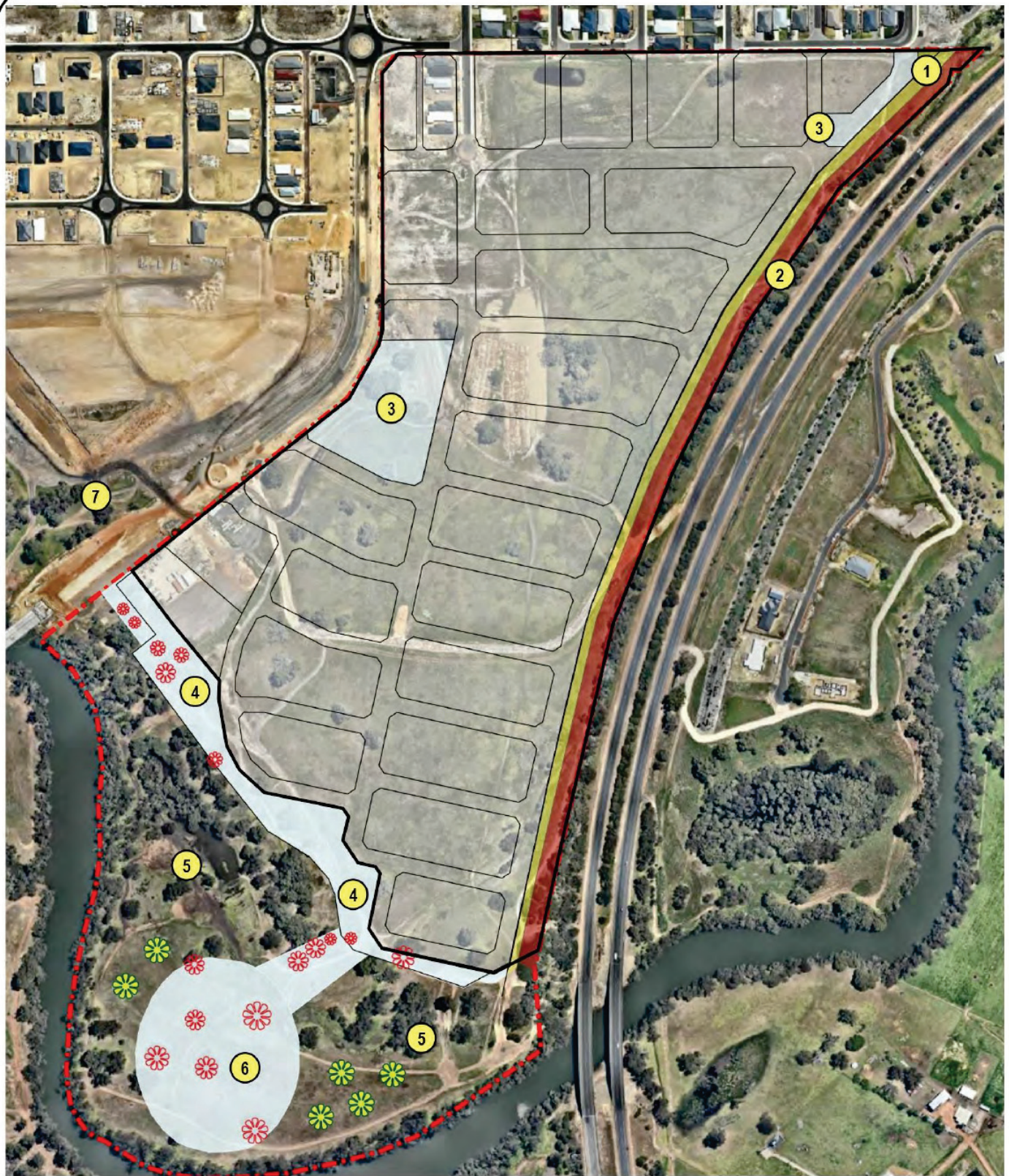
- A foreshore management plan for the Regional Open Space which will include potential revegetation of specific areas (Conditions 16 & 17);
- A 15m wide landscaped noise bund along Forest Highway (Condition 11); and
- Landscaping and maintenance of local POS reserves (Condition 22)

Local Open Space Areas, B, C and F are proposed to be developed and maintained as managed reserves being Excluded Low Threat Vegetation. Further information regarding this is provided in Section 4.3.

Area B and the Regional Open Space are comprised of three different vegetation treatments being:

- POS Landscaping – Low Threat Vegetation which relates to the open portions of the reserve on the top of the embankment which physically separate the housing development from the bushland areas. This area is to be maintained as an asset protection zone complying with Schedule 1 Element 2 of the Guidelines for Planning in Bushfire Prone Areas (Ver 1.3) noting that grass is to be maintained at less than 100mm in height.
- Woodland – Class B Woodland which relates to existing areas of woodland both on the top portion of the embankment and parts of the sloping areas. This area is to be maintained as Woodland as defined in AS3959 Table 2.3 and Figure 2.4 being trees to 30m in height with foliage cover to 30% with no middle storey vegetation and understorey of low shrubs with a maximum surface fuel load of 15t/ha.
- Full Vegetation - Class A Forest which relates to areas which will be fully revegetated with understorey and middle storey vegetation being located on part of the sloping embankment and also the floodplain.
- Slashed Grass with Isolated Tree Planting relates to the open area of the floodplain; and
- Oval which includes a 10m wide landscaping buffer.

The above revised vegetation classifications are also shown in Figure 7.








- | | | | | |
|---------------------|---|---|---|--|
| DEVELOPMENT AREA | — | A FOREST |  | 1 LANDSCAPED NOISE BUND 16.5m WIDE CONTIGUOUS WITH EXISTING ROADSIDE VEGETATION. |
| TREE REMOVAL |  | G GRASSLAND |  | 2 DRAINAGE SWALE 8.5m WIDE - GRASSLAND VEGETATION |
| INDICATIVE PLANTING |  | MANAGED LAND C 2.2.3.2(f) Low Threat Vegetation |  | 3 LOCAL OPEN SPACE AREAS - LANDSCAPE MANAGEMENT PLANS |
| | | | | 4 LOCAL OPEN SPACE ADJACENT TO FORESHORE ROS. |
| | | | | 5 REGIONAL OPEN SPACE - FORESHORE MANAGEMENT PLAN |
| | | | | 6 PROPOSED OVAL |
| | | | | 7 LOCAL OPEN SPACE AS PER PREVIOUS BMP REPORT |

FIGURE 5
VEGETATION
MODIFICATIONS



Job No 17-064
 Rev Description Date
 A Preliminary 03/01/2018
 B Revised SP 15/05/2018



3.0 BUSHFIRE ASSESSMENT RESULTS

3.1 Assessment Inputs

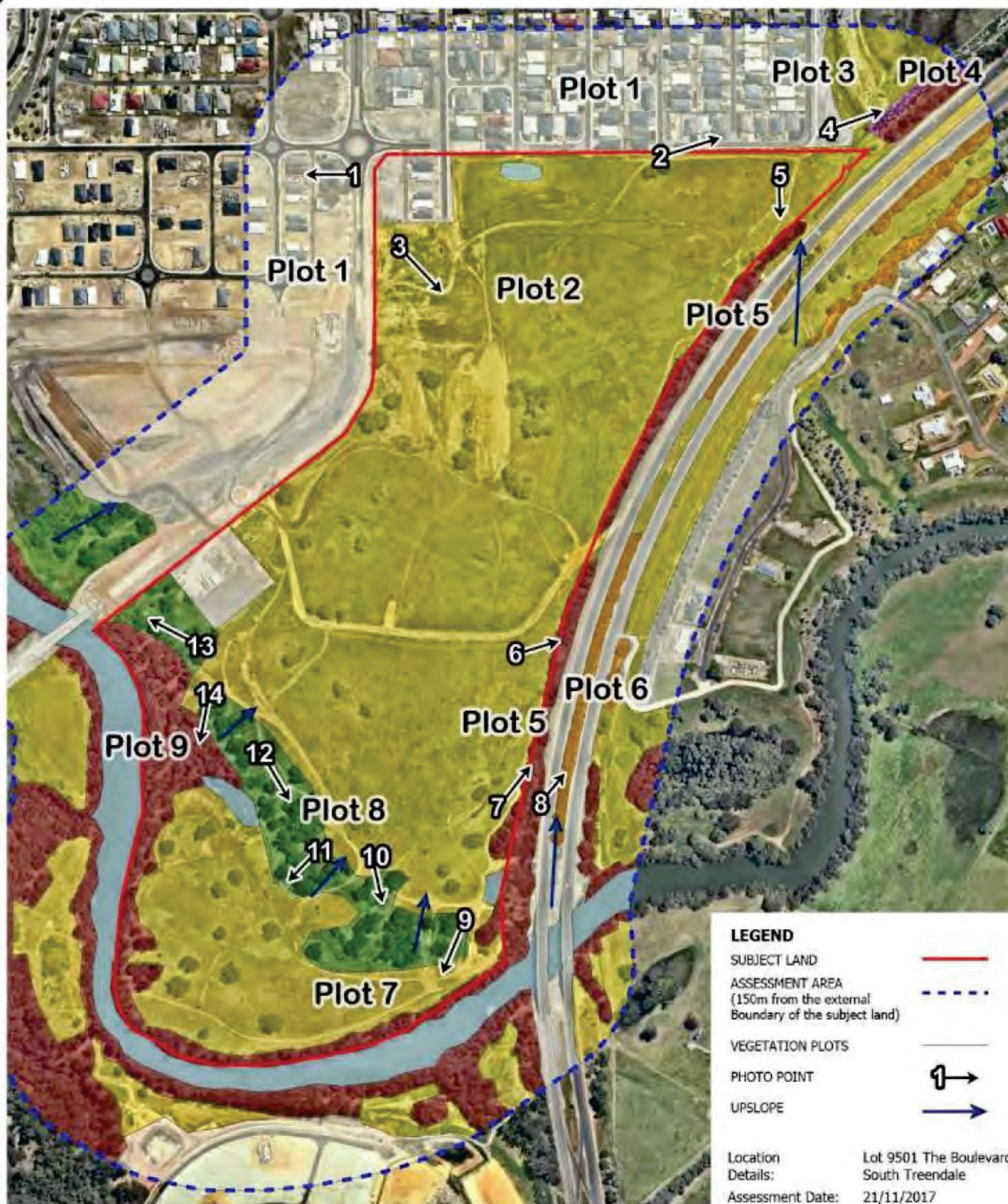
3.1.1 Existing Vegetation Classifications

The classification of the vegetation on and adjacent to the site is shown in Figure 6 and photographs on the following pages.

The classification is based upon AS3959 and also takes into account The Visual Guide for Bushfire Risk Assessment in Western Australia (WAPC 2016). The details of the vegetation plots are summarised in Table 1 below.

Table 1 Existing Vegetation Classifications

Plot No	Photo No	Applied Vegetation Classification	Slope Under Vegetation	Comment
1	1 & 2	Excludable - 2.2.3.2(e) Non Vegetated Areas	Flat	Adjacent subdivision and residential development
2	3	Class G Grassland – Closed tussock grassland G-21	Variable up to 2 deg	Pasture on the proposed development site.
3	4	Class G Grassland – Tussock grassland G-22	Upslope 2 deg	Drainage basin and bioretention planting
4	4	Class D Scrub - Closed scrub D-13	Upslope	Landscaping noise bund
5	5, 6, 7	Class A Forest - Open forest A-03	0 - 3 deg	Liner vegetation along highway verge.
6	8	Class D Scrub - Closed scrub D-13	0 - 3 deg	Liner vegetation along highway median.
7	9	Class G Grassland – Open tussock G-23	Flat	Floodplain adjacent to river
8	10, 11, 12, 13	Class B Woodland - Woodland B-05	Up to 14 degrees	Woodland on foreshore embankment
9	14	Class A Forest - Low open forest A-04	Flat	Melaleuca adjacent to wetland and vegetation along the river bank.



LEGEND

SUBJECT LAND

ASSESSMENT AREA
(150m from the external
Boundary of the subject land)

VEGETATION PLOTS

PHOTO POINT

UPSLOPE



Location Details: Lot 9501 The Boulevard
South Treendale

Assessment Date: 21/11/2017

Prepared by: G Lush

Accreditation Level: Level 2

Accreditation Number: BPAD 27682

Accreditation Expiry Date: February 2018

Date of Aerial: Nov 2017

A FOREST



G GRASSLAND



B WOODLAND



MANAGED LAND



C SHRUBLAND



WATER



D SCRUB



FIGURE 6
EXISTING VEGETATION



Job No 17-064

Rev A Description Preliminary

Date 03/01/2018

Photo No 1 Plot No 1

Vegetation Classification

Excludable - 2.2.3.2(e) Non
Vegetated Areas

Description

Residential development adjacent
to the site.



Photo No 2 Plot No 1

Vegetation Classification

Excludable - 2.2.3.2(e) Non
Vegetated Areas

Description

Residential development adjacent
to the site.



Photo No 3 Plot No 2

Vegetation Classification

Class G Grassland – Closed tussock
grassland G-21

Description

Proposed development site,
unmanaged grassland and trees in
the distance are to be removed.



Photo No 4 Plot No 3 & 4

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Roadside landscaping/noise bund to the north of the site with forest vegetation along the road verge. Foreground shows grassland adjacent to the development site which includes drainage basin.



Photo No 5 Plot No 5

Vegetation Classification

Class A Forest - Open forest A-03

Description

Linear strip of vegetation adjacent to highway. Mixed species height and density. Includes eucalypts to 18m and more than 50% foliage coverage with defined middle storey of scrubs and foliage extending to ground level. Heavy fuel loads, potentially more than 25tph.



Photo No 6 Plot No 5

Vegetation Classification

Class A Forest - Open forest A-03

Description

Linear strip of vegetation adjacent to highway being up to 20m wide. Mixed species height and density. Includes eucalypts to 18m and more than 50% foliage coverage with defined middle storey of scrubs and foliage extending to ground level. Heavy fuel loads, potentially more than 25tph.



Photo No 7 Plot No 5

Vegetation Classification

Class A Forest - Open forest A-03

Description

Linear strip of vegetation adjacent to highway. Mixed species height and density. Includes eucalypts to 18m and more than 50% foliage coverage with defined middle storey of scrubs and foliage extending to ground level. Heavy fuel loads, potentially more than 25tph.



Photo No 8 Plot No 6

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Scrub landscaping in highway medium. Linear planting generally less than 20m wide potentially contiguous with Plot 5.



Photo No 9 Plot No 7

Vegetation Classification

Class G Grassland – Open tussock G-23

Description

Grassland area on river foreshore subject to inundation. Some scattered trees.



Photo No 10 Plot No 8

Vegetation Classification

Class B Woodland - Woodland B-05

Description

Eucalypts on the foreshore slope.
Trees to 18m height with 30%
foliage coverage. No understorey
vegetation other than grassland.
Moderate fuel loads less than
25tph.



Photo No 11 Plot No 8

Vegetation Classification

Class B Woodland - Woodland B-05

Description

Eucalypts on the foreshore slope.
Trees to 18m height with 30%
foliage coverage. No understorey
vegetation other than grassland.
Moderate fuel loads less than
25tph.



Photo No 12 Plot No 8

Vegetation Classification

Class B Woodland - Woodland B-05

Description

Eucalypts on the foreshore slope.
Trees to 18m height with 30%
foliage coverage. No understorey
vegetation other than grassland.
Moderate fuel loads less than
25tph.



Photo No 13 Plot No 8

Vegetation Classification

Class B Woodland - Woodland B-05

Description

Eucalypts on the foreshore slope. Trees to 18m height with 30% foliage coverage. No understorey vegetation other than grassland. Moderate fuel loads less than 25tph.



Photo No 14 Plot No 9

Vegetation Classification

Class A Forest - Open forest A-03

Description

Melaleucas to 8m surrounding wetland on the foreshore area with more than 50% foliage coverage. Generally long grass understorey which potentially remain wet during summer. Adjacent riverbank vegetation of eucalypts to 15m with scrub understorey and heavy fuel loads.



3.2 Assessment Outputs

3.2.1 BAL Contour Map

Figure 7 shows the proposed modified vegetation with the associated vegetation plots being documented in Table 2.

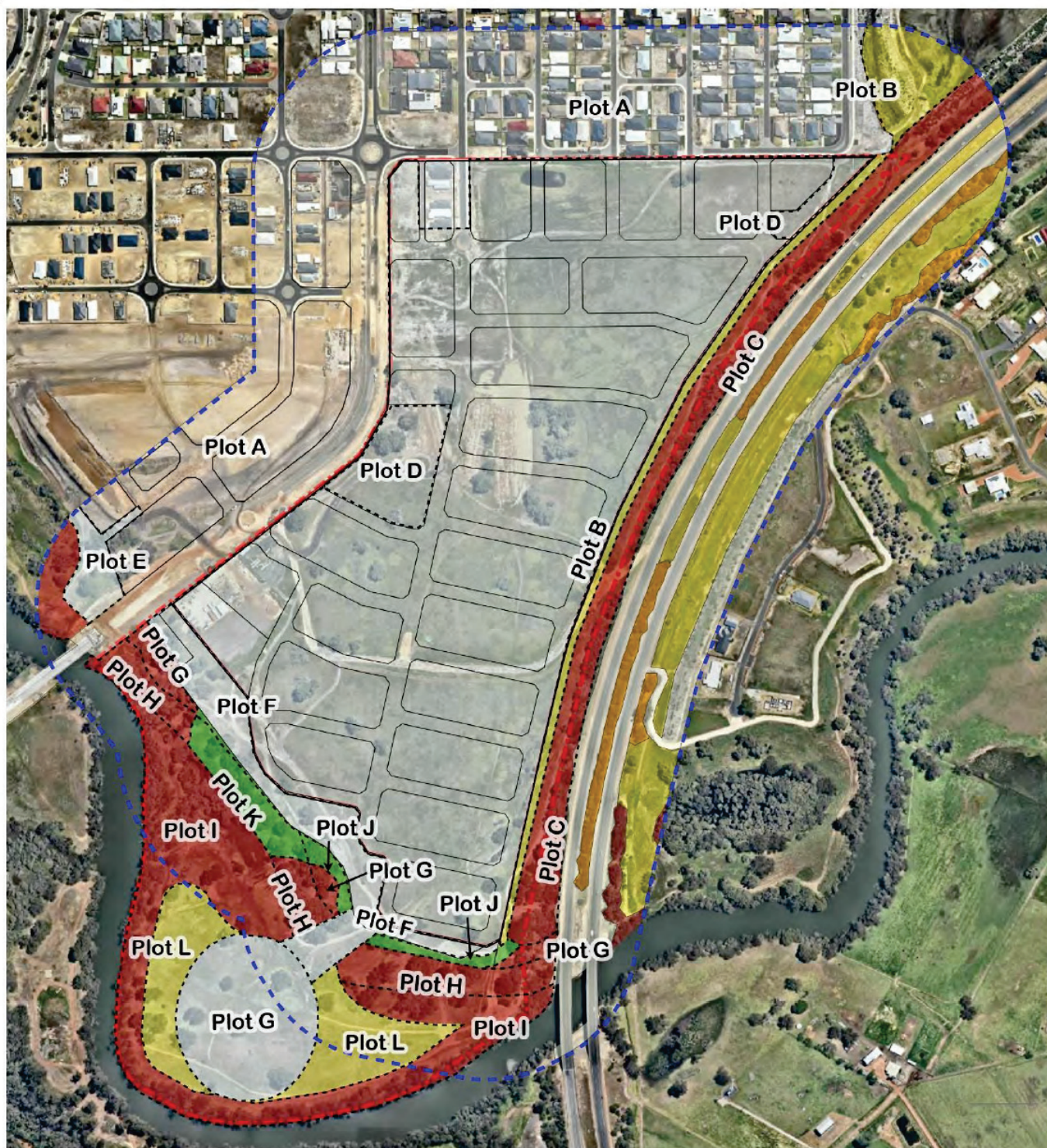
A BAL Contour Map is shown in Figure 9 and this is a plan of the subject lot/s illustrating the potential radiant heat impacts and associated indicative BAL ratings in reference to any classified vegetation remaining within 100 metres of the assessment area after the development is completed.

The BAL ratings for the individual lots are documented in Table 3 and this confirms that all lots will have a BAL-29 or lower rating.

Table 2 Modified Vegetation Plots

Plot No	Applied Vegetation Classification	Effective Slope	Comment
A	Excludable - 2.2.3.2(e) Non Vegetated Areas	Flat & Upslope	Adjacent subdivision and residential development. This includes the construction and development of the Stage 1 of the Estate on the western side of The Boulevard.
B	Class G Grassland – Closed tussock grassland G-21	Flat & Upslope	Grassland area which includes a drainage swale as shown in Appendix 1. This is 8.5m wide and contiguous with Plot C. The grassland classification recognises that there will be read type vegetation which may dry out over summer. The land slopes up along Forrest Highway which means that when measured at right angles there is a flat slope.
C	Class A Forest - Open forest A-03	Flat & Upslope	Vegetation along the verge of Forrest Highway and the adjacent landscaping noise bund as shown in Appendix 1. This is 16.5m wide and contiguous with the road verge vegetation and also with Plot B. The forest classification is a conservative approach which provides for the maximum of landscaping to be provided.
D	Excludable - 2.2.3.2(f) Low Threat Vegetation	Flat & Upslope	Local open space areas which will be landscaped as shown in the draft management plans included in Appendix 2. These areas will be established as maintained reserves with low threat vegetation which is then maintained by the Council.
E	Excludable - 2.2.3.2(f) Low Threat Vegetation	Flat & Upslope	This is a linear local open space area which is contained in the previous stage of development. The area will be established as a maintained reserve with low threat vegetation which is then maintained by the Council.

Plot No	Applied Vegetation Classification	Effective Slope	Comment
F	Excludable - 2.2.3.2(f) Low Threat Vegetation	0 - 5 deg	This is a linear local open space area. The use of this area as a bushfire buffer was established in the Stage 1 BMP and also for the Treendale development further north. The area is generally the flat land above the foreshore sloping embankment and it will have a dual use pathway. The area will be established as a maintained reserve with low threat vegetation which is then maintained by the Council. The Plot also includes the proposed sports oval located in the Regional Open Space on the river flood prone land.
G	Class A Forest - Open forest A-03	0 - 5 deg	Area of regional open space located at the top of the embankment which is proposed to be fully revegetated in accordance with the draft Foreshore Management Plan as shown in Appendix 3.
H	Class A Forest - Open forest A-03	10-15 deg	Area of regional open space being the embankment which is proposed to be fully revegetated in accordance with the draft Foreshore Management Plan as shown in Appendix 3.
I	Class A Forest - Open forest A-03	Flat	Area of regional open space located on the floodplain which is proposed to be fully revegetated in accordance with the draft Foreshore Management Plan as shown in Appendix 3.
J	Class B Woodland - Woodland B-05	0 - 5 deg	Area of local open space located at the top of the embankment which will be maintained as woodland in accordance with the draft Foreshore Management Plan as shown in Appendix 3. This means that there no middle storey vegetation and understorey of low shrubs with a maximum surface fuel load of 15t/ha.
K	Class B Woodland - Woodland B-05	10-15 deg	Existing woodland area on the embankment slope which will be maintained as woodland in accordance with the draft Foreshore Management Plan as shown in Appendix 3. This means that there no middle storey vegetation and understorey of low shrubs with a maximum surface fuel load of 15t/ha.
L	Class G Grassland – Tussock grassland G-22	Flat	Area of regional open space located on the floodplain which is proposed to have sparse revegetation in accordance with the draft Foreshore Management Plan as shown in Appendix 3.



LEGEND

DEVELOPMENT AREA



VEGETATION
ASSESSMENT AREA
(150m from the external
Boundary of the subject land)



VEGETATION PLOTS



PROPOSED CADASTRE



VEGETATION CLASS

A FOREST



B WOODLAND



D SCRUB



G GRASSLAND



AREA TO BE MODIFIED TO
LOW THREAT STATE



EXCLUDED AS PER 2.2.3.2(e)



Location

Lot 9501 The Boulevard

Details:

South Treendale

Assessment Date:

21/11/2017

Prepared by:

G Lush

Accreditation Level:

Level 2

Accreditation

BPAD 27682

Number:

Accreditation

February 2019

Expiry Date:

Date of Aerial

Nov 2017

FIGURE 7
PROPOSED VEGETATION
CLASSIFICATION

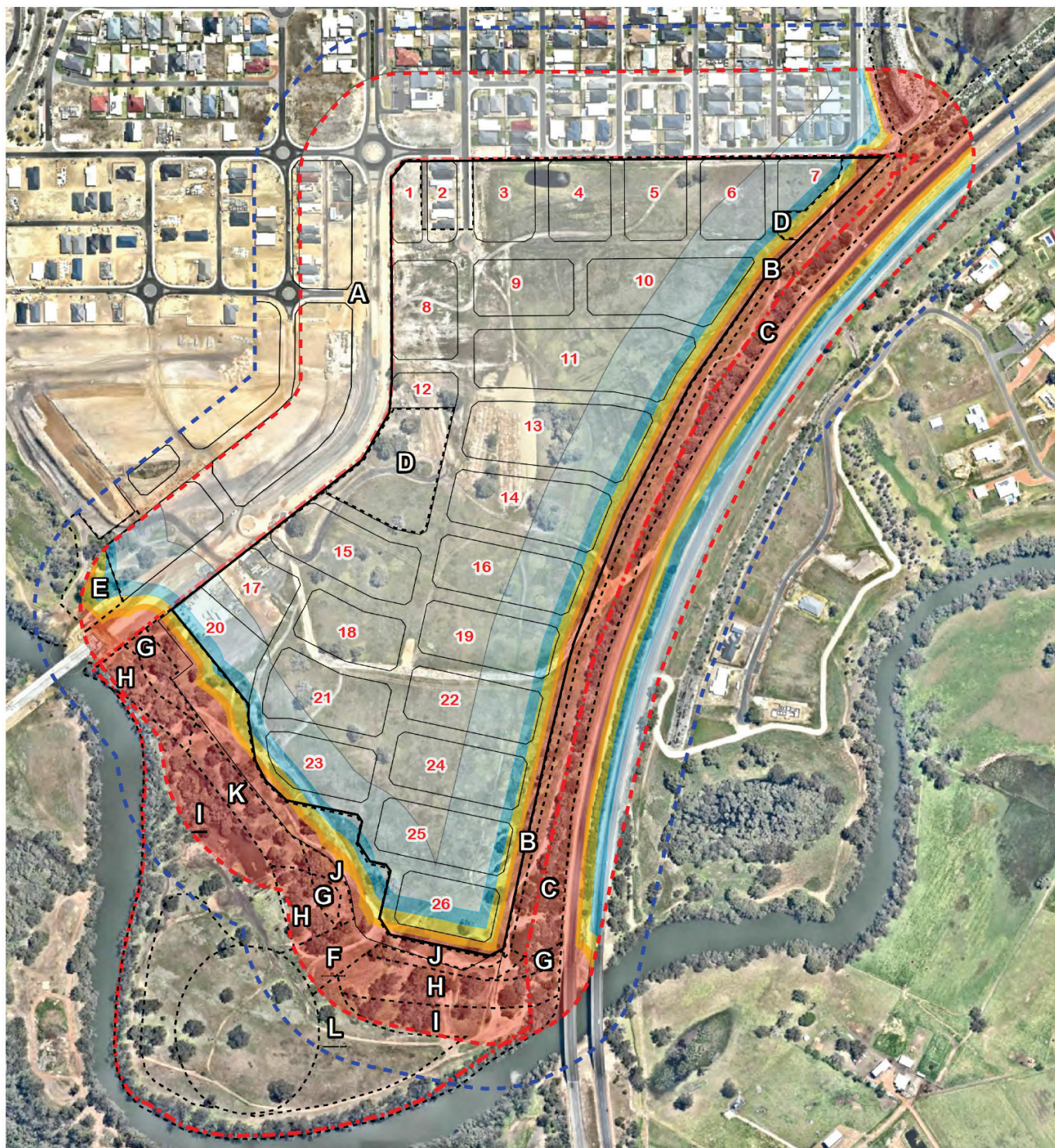


Job No 17-064

Rev Description
A Preliminary
B Revised SP

Date
03/01/2018
15/05/2018





LEGEND

DEVELOPMENT AREA

VEGETATION ASSESSMENT AREA
(150m from the external
Boundary of the subject land)

BAL CONTOUR ASSESSMENT AREA
(100m from external
boundary of the subject land)

VEGETATION PLOT

REFERENCE No

RESIDENTIAL CELL REF No
(Refer to Table 3)



INDICATIVE BUSHFIRE
ATTACK LEVELS

BAL - FZ	
BAL - 40	
BAL - 29	
BAL - 19	
BAL - 12.5	
BAL - Low	

Location	Lot 9501 The Boulevard
Details:	South Treendale
Assessment Date:	21/11/2017
Prepared by:	G Lush
Accreditation Level:	Level 2
Accreditation Number:	BPAD 27682
Accreditation Expiry Date:	February 2019
Date of Aerial	Nov 2017

FIGURE 8
BAL CONTOUR MAP

Table 3 Lot BAL Classifications

Lot Number	Vegetation Plot (1)	Vegetation Classification	Effective Slope	Separation Distance (2)	BAL Rating
1	C	A Forest	Flat	>100m	BAL-Low
2	C	A Forest	Flat	>100m	BAL-Low
3	C	A Forest	Flat	>100m	BAL-Low
4	C	A Forest	Flat	>100m	BAL-Low
5	C	A Forest	Flat	>100m	BAL-Low
6	C	A Forest	Flat	40m	BAL-19
7	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
8	C	A Forest	Flat	>100m	BAL-Low
9	C	A Forest	Flat	>100m	BAL-Low
10	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
11	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
12	C	A Forest	Flat	>100m	BAL-Low
13	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
14	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
15	C	A Forest	Flat	>100m	BAL-Low
16	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
17	G	A Forest	>0-5	75m	BAL-12.5
18	C	A Forest	Flat	>100m	BAL-Low
19	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
20	G	A Forest	>0-5	37m	BAL-19
	H	A Forest	>10-15	62m	BAL-19
21	H	A Forest	>10-15	73m	BAL-12.5
	G	A Forest	>0-5	57m	BAL-12.5
22	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
23	K	B Woodland	>10-15	30m	BAL-29
24	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
25	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
26 South	H	A Forest	>10-15	42m	BAL-29
	J	B Woodland	>0-5	25m	BAL-12

South Treendale Riverside

Lot Number	Vegetation Plot (1)	Vegetation Classification	Effective Slope	Separation Distance (2)	BAL Rating
26 East	C	A Forest	Flat	27m	BAL-29
	B	G Grassland	Flat	18m	BAL-12.5
Notes					
(1)	The selected vegetation plot is the plot with the highest BAL rating. The setbacks from secondary plots are shown in grey where they are not the determining vegetation class.				
(2)	The separation distance is measured to the nearest point on the lot boundary.				

4.0 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

4.1 Locality

Figure 1 shows the existing conditions for the locality around the subject land. The most significant bushfire hazard will be the Regional Open Space and associated revegetation along the river foreshore. The proposed road network and the bridge over the Collie River provide excellent district access in multiple directions.

The other external threat would be a potential fire on the adjacent Forrest Highway which may be caused by a motor vehicle accident or by arson.

4.2 Development Interface

The level of the bushfire hazard is directly proportional to the distance / setback from the areas of high fuel loadings. On the urban fringe the combination of embers and radiation caused by urban fuel combustion (adjacent structures, fences, stored material etc) has been identified as a predominant source of ignition (2). The provision of a clear separation zone between the vegetation and development areas provides the simplest form of fire management.

The Guidelines promote that there should be a physical edge which is best provided by a subdivision road as is proposed in the development. Ensuring that the lots are setback so that they all have a BAL-29 or less rating complies with the objectives of SPP3.7 Planning in Bushfire Prone Areas for the provision of a suitable separation distance.

4.3 Local Open Space

As indicated in Section 2.2 Local Open Space Areas, B, C and F are proposed to be developed and maintained as managed reserves being Excluded Low Threat Vegetation maintained by the Shire of Harvey. The precedent for this has already been established in the previous stages of the development and associated subdivision conditions.

This would be subject to a landscaping plan approved by Council with the landscaping established by the developer and maintained for two years as prescribed by Model subdivision condition R4 which states that:

Arrangements being made for the proposed public open space to be developed by the landowner/ applicant to a minimum standard and maintained for two summers through the implementation of an approved landscape plan providing for the development and maintenance of the proposed public open space in accordance with the requirements of Liveable Neighbourhoods and to the specifications of the local government. (Local Government).

This is further reinforced in Section 6.3.3.2 of the Local Government Guidelines for Subdivisional Development (3) which set out the standard requirements for the development of public open space including:

- a) The preparation of a management plan;
- b) A long-term maintenance agreement based on the management plan being entered into by the developer with the Local Government as part of the approval.

2 Handmer J & Haynes K (2008) – Community Bushfire Safety CSIRO Publishing Melbourne Pages 77 & 81.

3 Department of Planning Lands and Heritage (2017) Local Government Guidelines for Subdivisional Development

- c) A landscape maintenance and watering period of at least two summer periods to ensure full establishment, which includes a maintenance bond.

Further justification of this assumption can be provided by including the approval of the landscape and maintenance plans by the local Council as part of the requirements for clearance of the subdivision conditions associated with this bushfire management plan.

5.0 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

5.1 Compliance Table

In formulating the proposed mitigation measures regard has been given to the objectives, general principles, guidance statements and performance criteria contained in the Guidelines for Planning in Bushfire Prone Areas and specifically the Bushfire Protection Criteria. The requirements in the Bushfire Protection Criteria and the proposed mitigation strategies are summarised in Table 4 and shown spatially in Figure 9.

Table 4 Bushfire Protection Criteria

Bushfire protection criteria	Method of Compliance Acceptable solutions / Performance based solution	Compliance	Proposed bushfire management strategies
Element 1: Location	A1.1 Development location	Yes	The proposed lots will have a BAL-29 or lower rating.
Element 2: Siting and design	A2.1 Asset protection zone (APZ)	Yes	The lots are not large enough to contain the APZ within their own boundaries. Generally, for the "first row" of dwellings adjacent to the hazard areas the APZ will be provided within the development setback from the front boundary combined with the 18m wide road reserve and in some instance portions of the Local Open Space. This complies with the Guidelines which state on page 63 of the BPC that the APZ may include public roads, waterways, footpaths, buildings, rocky outcrops, golf courses, maintained parkland as well as cultivated gardens in an urban context.
Element 3: Vehicular access	A3.1 Two access routes A3.2 Public road	Yes Yes	The Boulevard provide district access in two directions. The subdivision roads will be constructed in accordance with the Local Government Guidelines (4) for Subdivisional Development

4 Department of Planning Lands and Heritage (2017) Local Government Guidelines for Subdivisional Development

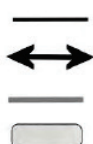
South Treendale Riverside

Bushfire protection criteria	Method of Compliance Acceptable solutions / Performance based solution	Compliance	Proposed bushfire management strategies
			which meet required specifications for bushfire access.
	A3.3 Cul-de-sac (including a dead-end- road)	N/A	There are no cul-de-sacs in the development.
	A3.4 Battle-axe	N/A	There are no battle axe lots.
	A3.5 Private driveway longer than 50m is to meet detailed requirements contained within the Guidelines.	N/A	There are no lots more than 50m deep.
	A3.6 Emergency access way (EAW)	N/A	There are no proposed EAWs
	A3.7 Fire service access routes (FSAR)	N/A	There are no proposed FSARs
	A3.8 Firebreak width	N/A	All lots are less than 0.5ha in size.
Element 4: Water	A4.1 Reticulated areas	Yes	The subdivision will be serviced with fire hydrants in accordance with the required specification. A plan of the hydrants will be submitted to Council and DFES as part of the subdivision clearance. Not applicable
	A4.2 Non-reticulated areas	N/A	
	A4.3 Individual lots within non-reticulated areas.	Yes	



LEGEND

DEVELOPMENT AREA
DISTRICT ROAD ACCESS
LOCAL ROADS
DEVELOPED LAND



HAZARD VEGETATION
BUSHFIRE PRONE LAND
100m SETBACK BAL_Low
LOW THREAT VEGETATION
LOCAL OPEN SPACE
ASSET PROTECTION
ZONE



NOTES

- 1) Asset protection zone maintained in accordance with Schedule 1 Element 2 of the Guidelines for Planning in Bushfire Prone Areas (Ver 1.3) with grass being less than 100mm in height.
- 2) Local Open Space reserve managed as Low Threat Vegetation in accordance with approved management plan.
- 3) Regional Open Space foreshore reserve vegetation rehabilitation in accordance with approved management plan.
- 4) Dwellings within 100m of hazard vegetation to be constructed in accordance with AS3959 Construction of Buildings in Bushfire Prone Areas.
- 5) Potential staging of development subject to interim bushfire management measures.

FIGURE 9
BUSHFIRE MITIGATION MEASURES
SPATIAL REPRESENTATION



Job No 17-064

Rev Description
A Preliminary
B Revised SP

Date
03/01/2018
15/05/2018

 **LUSHfire**
and planning
geoffrey@lushfire.com.au
0418 954873

5.2 Additional Management Strategies

5.2.1 Purchaser Advice

All prospective purchasers must be made aware of the fire management issues, measures and responsibilities associated with the subdivision. This can be a notification placed upon the Certificate of Title of all lots pursuant to Section 70A of the Transfer of Land Act advising landowners of this Bushfire Management Plan and BAL requirements.

5.2.2 Staging

The development of the estate will have staged construction. In the event that the subdivision is staged then it is necessary to ensure that appropriate interim measures are provided. These may include:

- Interim access or emergency access ways;
- Creation of additional low fuel zones to ensure that the intended BAL ratings can be applied; or
- The provision of boundary firebreaks especially on any balance lot.

For any proposed stage of the subdivision a statement and plan of the proposed interim fire management measures will be submitted and approved by the Shire as an adjunct to Figure 9.

6.0 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE MEASURES

The management of the risk posed by bushfires is a shared responsibility between landowners, government and industry. These responsibilities are summarised in Table 5.

Table 5 Implementation

No	MANAGEMENT ACTION	TIMING
1.0 Developer Prior to Issue of Titles		
1.1	Construction of subdivision roads to standards outlined in the BMP to ensure safe access and egress.	Subdivision
1.2	A plan demonstrating the location and capacity of fire the fire hydrants shall be submitted to the Shire of Harvey and DFES	Subdivision
1.3	Preparation and approval of the landscape and maintenance plans by Council for the areas of Local Open Space. These are to address the proposed vegetation modification, separation areas, fuel loads and weed management and specifications contained in Schedule 1 Standards for Asset Protection Zones.	Subdivision
1.4	Preparing a notification be included on the certificate of titles for the lots shown on Figure 9 as being bushfire prone advising that the land is subject to a Bushfire Management Plan.	Subdivision
2.0 Developer Prior to Sale		
2.1	Providing prospective residents with a summary of this BMP	
3.0 Landowner Prior to Occupancy		
3.1	Ensuring that any application for a building permit for a dwelling is to include an individual BAL assessment to confirm that sufficient land has been cleared to provide for BAL-29 setbacks.	Development
4.0 Landowners Ongoing		
4.1	Undertaking regular maintenance of their property in preparation for the annual fire season.	Ongoing
4.2	Ensuring that all fire mitigation measures shall be completed by the date prescribed in Council's Firebreak Order.	Ongoing
5.0 Local Government Ongoing Management		
5.1	Ensuring Building Permit Applications and Development Applications are compliant with the building and land use planning provisions	Ongoing
5.2	Maintenance of the designated areas of Local Open Space as low threat vegetation in accordance with the approved management plans.	Ongoing
5.3	Enforce compliance with its annual firebreak notice.	Ongoing

7.0 REFERENCES

- Cheney P & Sullivan A (2008) *Grassfires – Fuel, Weather and Fire Behaviour*. CSIRO Publishing Collingwood
- DFES (2011) *Firebreak Location, Construction and Maintenance Guidelines*
- DFES (2012) *Prepare Act Survive* Perth DFES
- Ellis, S, Kanowski, P & Whelan, R (2004), *National Inquiry on Bushfire Mitigation and Management*, Canberra. Council of Australian Governments.
- Emergency Management Australia (2002) *Manual No 7 Planning Safer Communities – Land Use Planning for Natural Hazards* Commonwealth Attorney General's Department
- DFES (2010) *Planning for Bush Fire Protection*. Perth. Western Australian Planning Commission.
- DFES (2005) *Western Australian Emergency Risk Management Guide* FESA Perth
- DFES (2007) *Visual Fuel Load Guide*. Perth. Fire & Emergency Services Authority of Western Australia.
- DFES (undated) *Homeowner's Bush Fire Survival Manual*.
- Department of Planning Lands and Heritage (2017) *Local Government Guidelines for Subdivisional Development*
- Handmer J. & Haynes K. (Eds).(2008). *Community Bushfire Safety*. Collingwood CSIRO Publishing.
- Keelty J (2011) *A Shared Responsibility – The Report of the Perth Hills Bushfire February 2011* Review Government Printer Perth
- Keelty M (2012) *Appreciating the Risk – Report of the Special Inquiry into the November 2011 Margaret River Bushfire* Government Printer Perth
- Leading Emergency Services (2011) *Major Incident Review, Lake Clifton, Roleystone and Red Hills Fires*
- Leonard J (2009) *Report to the 2009 Victorian Bushfires Royal Commission Building performance in Bushfires* CSIRO
- Middelmann, M. H. (Editor) (2007) *Natural Hazards in Australia: Identifying Risk Analysis Requirements*. Geoscience Australia, Canberra
- Ramsay C. & Rudolph L. (2006) *Landscape and Building Design for Bushfire Areas*. Collingwood CSIRO Publishing.
- Ramsay, GC & Dawkins D (1993) *SAA HB36-1993 Buildings in Bushfire Prone Areas – Information and Advice*. Sydney. Standards Australia International Ltd.
- Standards Australia (2009) *AS/NZS ISO 31000 Risk Management- Principles and Guidelines* Sydney. Standards Australia International Ltd.
- Standards Australia (2004) *AS/NZS 4360 Risk Management*. Sydney. Standards Australia International Ltd.
- Standards Australia (2009) *AS 3959 – Construction of Buildings in Bush Fire Prone Areas*. Sydney. Standards Australia International Ltd.
- Victorian Bushfires Royal Commission (2010) *Final Report* Government Printer Melbourne
- Webster J (2012) *Essential Bushfire Safety Tips* CSIRO Publishing Collingwood

8.0 APPENDICES

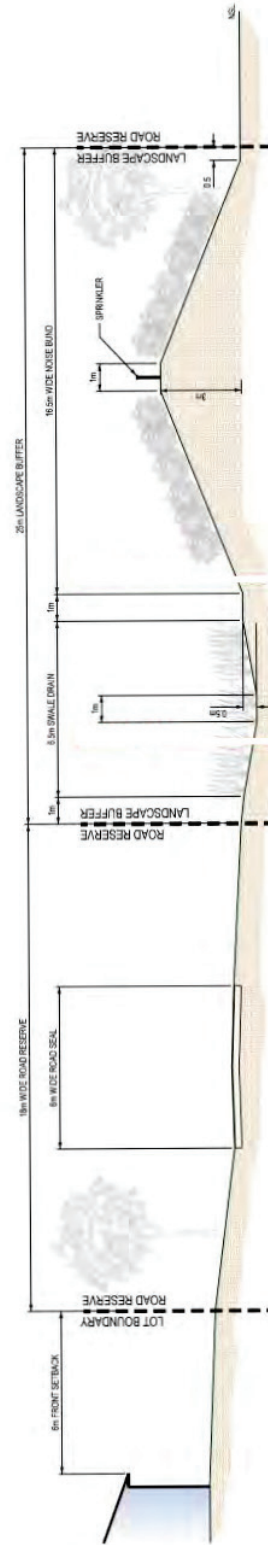
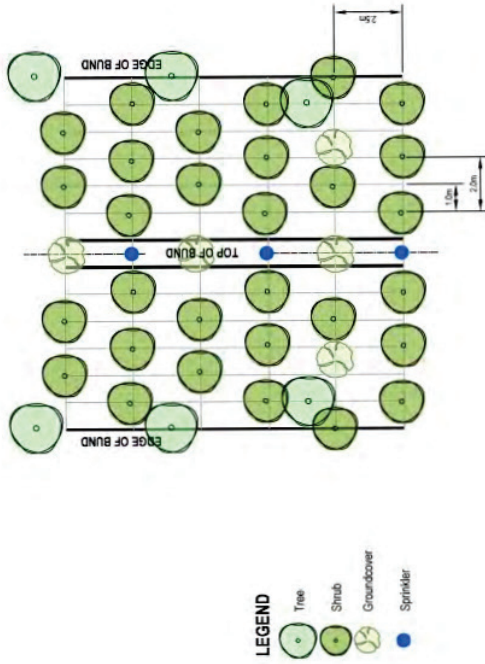
APPENDIX 1

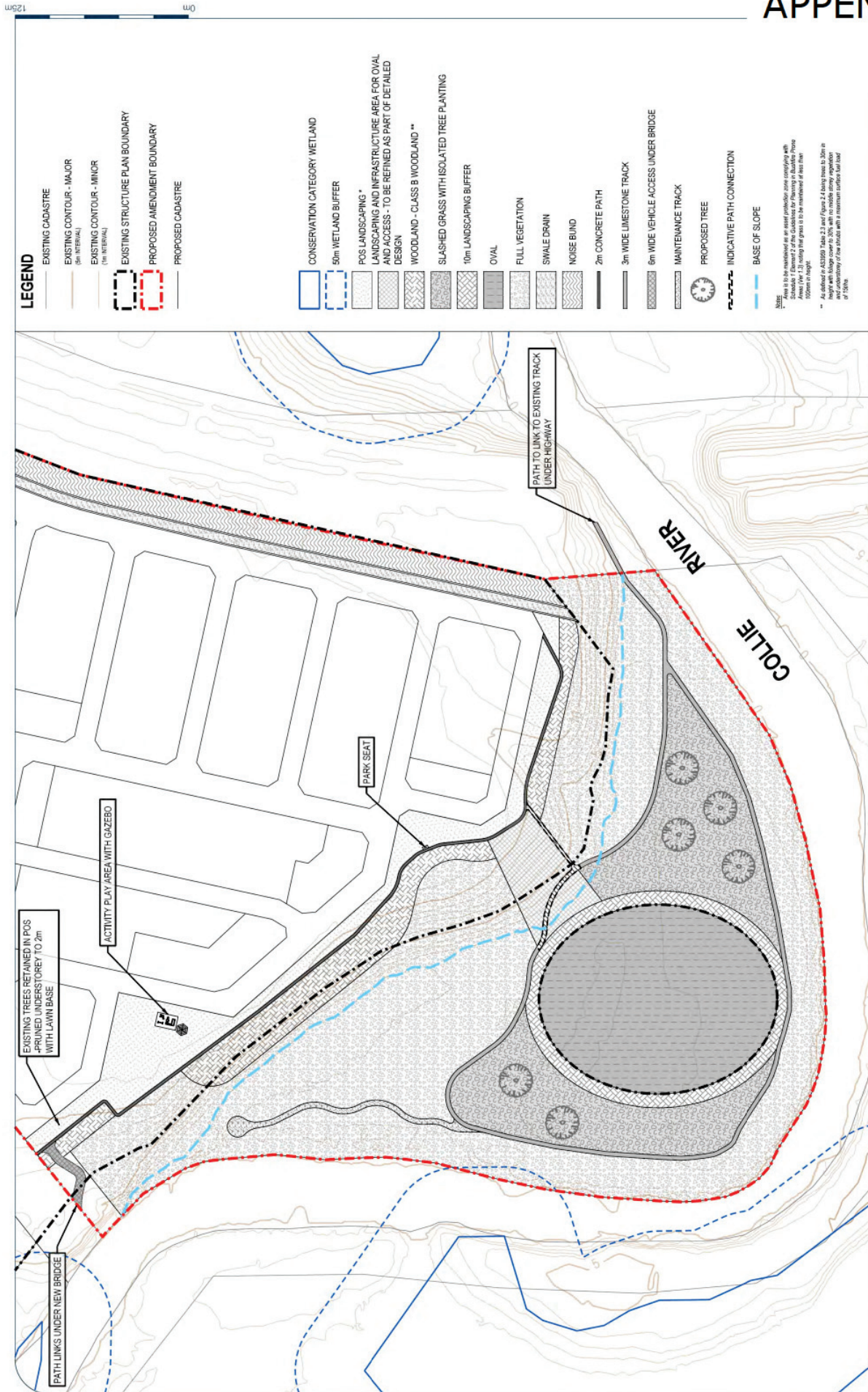


Rev	Description	Date
A	Preliminary	11/12/2016



FIGURE 10 - SOUTH TREENDALE
BUSHFIRE MITIGATION MEASURES
Sheet 1 of 2





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LANDSCAPING PLAN FOR POS AREA 'E' AND 'D'

South Treendale, Harvey

Plan No: 17-001886F

Date: 27/06/2017

Rev: 0

Scale: A1 @ 1:1250, A3

Co-ords: A

Author:

Appendix B Staging Plan



LEGEND

- EXISTING CADASTRAL BOUNDARIES
- EXISTING STRUCTURE PLAN BOUNDARY
- PROPOSED CADASTRAL BOUNDARIES
- INDICATIVE STAGING BOUNDARY

POS SCHEDULE

POS (A)	(Resitified)
POS (B)	
POS (C)	
POS (D)	
POS (E)	(Resitified)
POS (F)	
COMMUNITY FACILITY	
TOTAL	

1,812ha
1,890ha
1,286ha
1,845ha
2,145ha
0,293ha
0,286ha
9,479ha





CONTACT US

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