



BUSHFIRE THREAT ASSESSMENT

**FOR
A PROPOSED TWO -STAGED
RESIDENTIAL SUBDIVISION AT**

**256 LENNOXTON ROAD,
VACY, NSW 2421**

Prepared by:

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| | |
|------------------------------------|--|
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| Prepared for: | Perception Planning |
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| Document Status & Date: | 03/07/2024 |
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| Reviewer: | Sarah Jones |

Disclaimer

Notwithstanding the precautions adopted within this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains, and although the standard is designed to improve the performance of such buildings, there can be no guarantee, because of the variable nature of bushfires, that any one building will withstand bushfire attack on every occasion.



Executive Summary

A Bushfire Threat Assessment Report (BTA) has been prepared by Firebird ecoSultants Pty Ltd at the request of Perception Planning for a proposed two-staged subdivision at Lot 8 DP 739338 and Lot 94 DP 788016 Lennoxton Road, Vacy. The report forms part of the supporting documentation for a DA to be submitted to Dungog Shire Council (DSC).

The report demonstrates compliance with Planning for Bushfire Protection 2019 (NSW RFS, 2019) and AS3959-2018 Construction of Buildings in Bush Fire Prone Areas.

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to the proposal. Recommendations are provided with regard to fuel management, access, provision of emergency services, building protection and construction standards to facilitate an acceptable level of bushfire protection.

In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements for the proposed subdivision:

- APZs have been provided in accordance with Table A1.12.2 in PBP 2019 and will occur entirely within the boundary of the proposed lots. See Chapter 4 and Figure 4-1 for APZs on proposed future habitable buildings and Figure 4-2 for APZs on proposed lots.

These distances are to be managed as described under 'Planning for Bushfire Protection (Appendix 4 – Asset Protection Zone Requirements)' and the document titled 'Standards for Asset Protection Zones'.

- Based on the APZs provided Chapter 4, we understand that future dwellings may be sited to achieve 29kW/m², which would result in BAL-29. However, all future buildings will be subject to a separate Bushfire Assessment Report (BAR) at a future point in time and so different variables (e.g., Fire Danger Index, vegetation classification, data available on slope, etc). may be used that mean the dwelling house may not be able to achieve 29kW/m².
- An assessment has identified that the primary property access road is to be:
 - a. Minimum of 4m carriageway width,
 - b. Passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay,
 - c. Minimum vertical clearance of 4m to any overhanging obstructions, such as tree branches,
 - d. Suitable turning head, being a loop around the dwelling,
 - e. Minimum distance between inner and outer curves is 6m,
 - f. Crossfall is not more than 10 degrees,
 - g. Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads,



- h. Bridges and Causeways are designed sufficiently to carry a fully loaded firefighting vehicle (up to 23 tonnes) and signage is put in place to clearly indicate the maximum load rating of 23 tonnes,

Note: Some short constructions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed.

- The non-perimeter roads identified on the subdivision plan are compliant with the following with the exception of parking provided outside the carriageway as there is ample room on proposed lots for parking to occur:
 - › Minimum 5.5m carriageway width kerb to kerb;
 - › Hydrants are located clear of parking areas;
 - › Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m;
 - › Curves of roads have a minimum inner radius of 6m;
 - › The road crossfall does not exceed 3 degrees; and
 - › A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.
- An assessment of the existing water supply has shown that reticulated water is not connected to the subject site therefore any future dwellings will require a static water supply in accordance with Table 5.3d in PBP 2019 that complies with the following requirements:
 - › a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet;
 - › ball valve and pipes are adequate for water flow and are metal;
 - › supply pipes from tank to ball valve have the same bore size to ensure flow volume;
 - › underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank;
 - › a hardened ground surface for truck access is supplied within 4m;
 - › above-ground tanks are manufactured from concrete or metal;
 - › raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959);
 - › unobstructed access can be provided at all times;
 - › underground tanks are clearly marked;
 - › tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters;
 - › all exposed water pipes external to the building are metal, including any fittings;
 - › where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm



- internal diameter; and
- › fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.

**I certify the development conforms to the relevant specifications and requirements of
Planning for Bushfire Protection 2019**

Sarah Jones  
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FPA BPAD-A Certified Practitioner (Certification Number BPD-PA-26512)
Ecologist / Bushfire Planner



Terms & Abbreviations

| Abbreviation | Meaning |
|----------------|--|
| APZ | Asset Protection Zone |
| AS2419 -2005 | Australian Standard – Fire Hydrant Installations |
| AS3959-2018 | Australian Standard – Construction of Buildings in Bush Fire Prone Areas |
| BCA | Building Code of Australia |
| BPA | Bush Fire Prone Area (Also Bushfire Prone Land) |
| BFPL Map | Bush Fire Prone Land Map |
| BPMs | Bush Fire Protection Measures |
| BFSA | Bush Fire Safety Authority |
| CC | Construction Certificate |
| DSC | Dungog Shire Council |
| <i>EPA Act</i> | <i>NSW Environmental Planning and Assessment Act 1979</i> |
| FFDI | Forest Fire Danger Index |
| FMP | Fuel Management Plan |
| ha | hectare |
| IPA | Inner Protection Area |
| LGA | Local Government Area |
| OPA | Outer Protection Area |
| PBP | Planning for Bushfire Protection 2019 |
| PoM | Plan of Management |
| RF Act | Rural Fires Act 1997 |
| RF Regulation | Rural Fires Regulation |



CONTENTS

| | | |
|--|---|------------|
| 1 | INTRODUCTION | 1 |
| 1.1 | Site Particulars | 1 |
| 1.2 | Description of the Proposal | 3 |
| 1.3 | Legislative Requirements | 3 |
| 1.4 | Objectives of Assessment | 3 |
| 2 | METHODOLOGY | 5 |
| 2.1 | Vegetation Assessment | 5 |
| 2.2 | Slope Assessment | 5 |
| 3 | SITE ASSESSMENT | 6 |
| 3.1 | Vegetation & Slope Assessment | 6 |
| 4 | BUSHFIRE PROTECTION ASSESSMENT | 8 |
| 4.1 | Asset Protection Zones (APZ) | 8 |
| 5 | DWELLING DESIGN & CONSTRUCTION | 18 |
| 5.1 | Determination of Bushfire Attack Levels | 20 |
| 6 | COMPLIANCE | 21 |
| 7 | CONCLUSION & RECOMMENDATIONS | 30 |
| 8 | BIBLIOGRAPHY | 33 |
| APPENDIX A PROPOSED SITE PLANS | | A-1 |
| APPENDIX B ASSET PROTECTION ZONES | | B-1 |

TABLES

| | |
|---|----|
| Table 3-1: Vegetation Classification for the subject site | 6 |
| Table 4-1: Recommended APZs for Future dwellings | 8 |
| Table 5-1: Determination of BALs for Future dwellings within site | 20 |
| Table 6-1: Proposed Subdivision Compliance with Development Standards | 21 |

FIGURES

| | |
|--|----|
| Figure 1-1: Site Location | 2 |
| Figure 1-2: Bushfire Prone Land Map | 4 |
| Figure 3-1: Vegetation Map | 7 |
| Figure 4-1: APZ Map | 16 |
| Figure 4-2: APZ Map (no building envelope) | 17 |



I INTRODUCTION

A Bushfire Threat Assessment Report (BTA) has been prepared by Firebird ecoSultants Pty Ltd at the request of Perception Planning for a proposed two-staged residential subdivision at 256 Lennoxton Road, Vacy, hereafter referred to as the “site” (refer to Figure 1-1 for site locality). Refer to Appendix A for Proposed Site Plans.

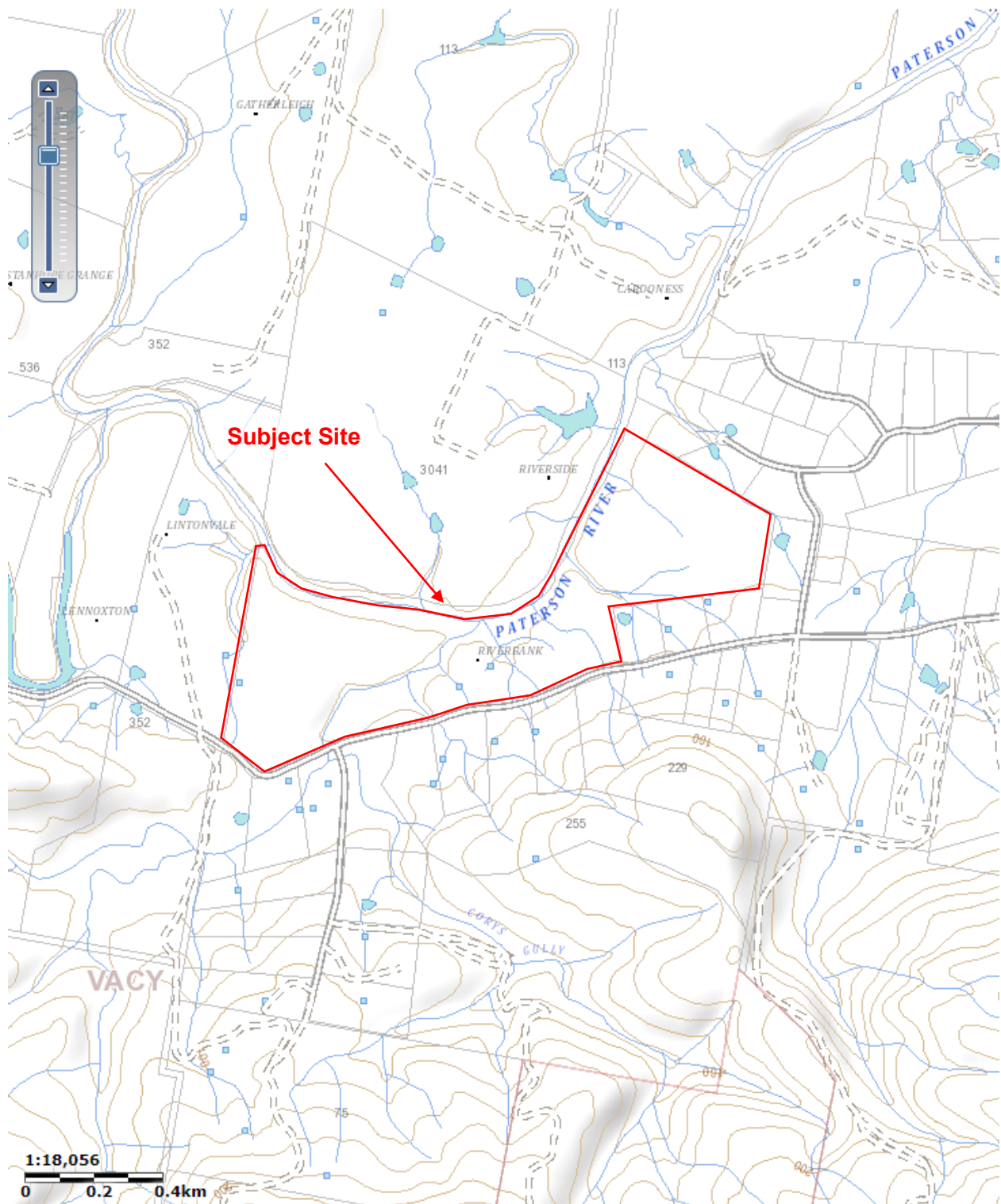
This BTA is suitable for submission with a Development Application (DA) and provides information on measures that will enable the development to comply with ‘Planning for Bushfire Protection’ (NSW RFS, 2019), hereafter referred to as PBP (RFS, 2019).

This assessment aims to consider and assess the bushfire hazard and associated potential threats relevant to such a proposal, and to outline the minimum mitigative measures which would be required in accordance with the provisions of the Environmental Planning and Assessment Amendment (Planning for Bushfire Protection) Regulation 2007 and the Rural Fires Amendment Regulation 2007 (RF Amendment Regulation 2007).

I.1 Site Particulars

| | |
|-----------------------------|---------------------------------|
| Locality: | 256 Lennoxton Road, Vacy, 2421. |
| LGA: | Dungog Shire Council |
| Current Land Use: | Vacant lots |
| Forest Danger Index: | 100 FFDI |

Figure 1-1: Site Location





I.2 Description of the Proposal

This DA relates to the proposal for a two-staged residential subdivision. Refer to Appendix A for proposed plans.

I.3 Legislative Requirements

The Site has been mapped as Bush Fire Prone Land Map (BFPLM) by DSC.

This report forms part of the supporting documentation for a Development Application (DA) to be submitted to DSC.

This BTA has been prepared using current legislative requirements and associated guidelines for assessment of bushfire protection, these being:

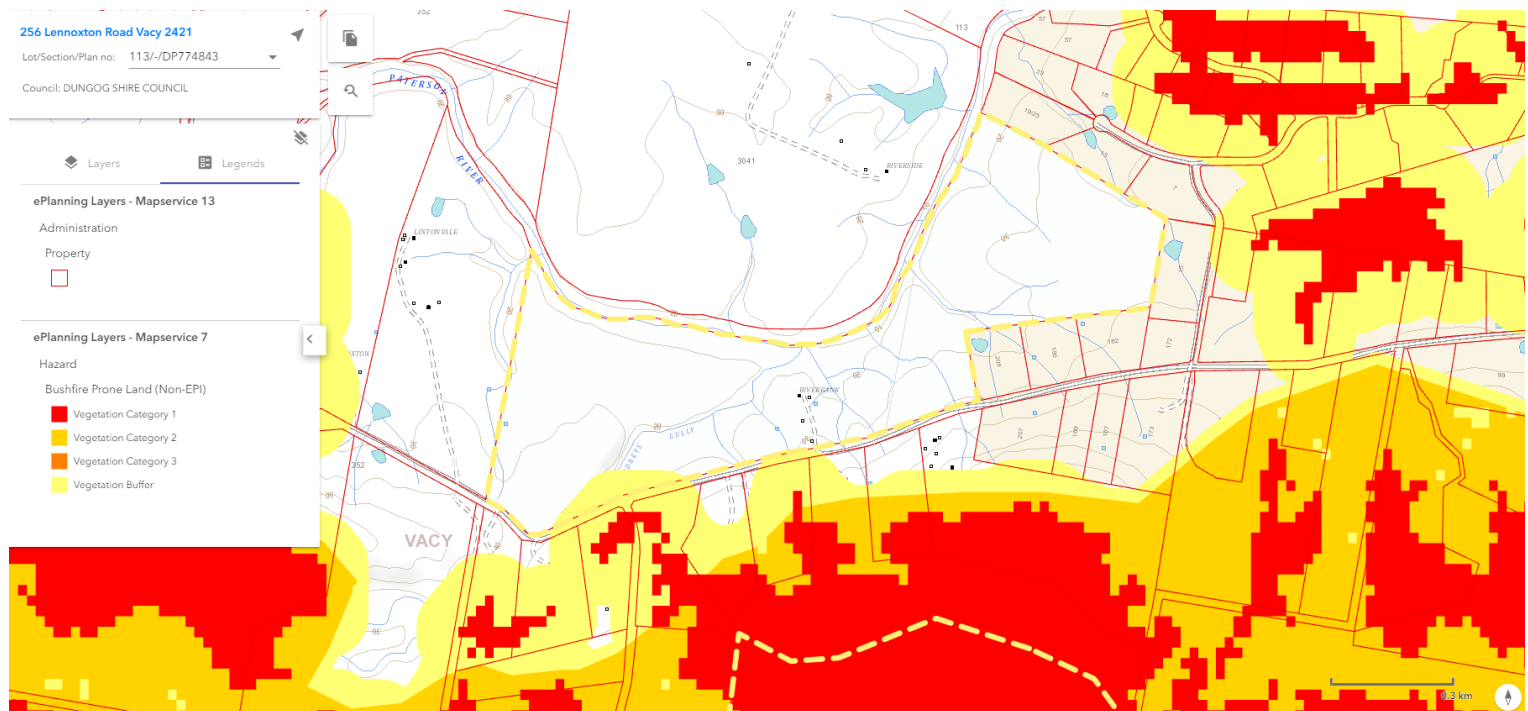
- PBP (RFS, 2019);
- AS3959-2018 Construction of Buildings in Bushfire Prone Area; and

I.4 Objectives of Assessment

This report has been prepared to address the requirements of Clause 44 of the Rural Fires Regulation. This BTA also addresses the six key Bush Fire Protection Measures (BFRMs) in a development assessment context being:

- The provision of clear separation of buildings and bush fire hazards, in the form of fuel-reduced APZ and their components being Inner Protection Areas (IPA's) and Outer Protection Areas (OPA's);
- Sitting and design of the proposal;
- Construction standards;
- Appropriate access standards for residents, fire-fighters, emergency workers and those involved in evacuation;
- Adequate water supply and pressure, and utility services; and
- Suitable landscaping, to limit fire spreading to a building.

Figure 1-2: Bushfire Prone Land Map





2 METHODOLOGY

2.1 Vegetation Assessment

Vegetation surveys and vegetation mapping carried out on the site has been undertaken as follows:

- Aerial Photograph Interpretation to map vegetation cover and extent
- Confirmation of the vegetation assemblage typology present.

2.2 Slope Assessment

Slope assessment has been undertaken as follows:

- Aerial Photograph Interpretation in conjunction with analysis of electronic contour maps with a contour interval of 10m.



3 SITE ASSESSMENT

The following assessment has been undertaken in accordance with the requirements of PBP (RFS, 2019).

3.1 Vegetation & Slope Assessment

In accordance with PBP (RFS 2019), an assessment of the vegetation over a distance of 140m in all directions from the site was undertaken. Vegetation that may be considered a bushfire hazard was identified in all directions from the site. This assessment is depicted in Table 3-1 and Figure 3-1 that shows the vegetation post development.

In accordance with PBP (RFS 2019), an assessment of the slope that the vegetation considered a bushfire hazard was undertaken and the results are presented in Table 3-1 below.

Table 3-1: Vegetation Classification for the subject site

| Direction | Vegetation Type | Slope |
|-----------|----------------------------------|-------------|
| North | Grassland Vegetation | Flat |
| East | Managed Land - Rural Residential | Cross-slope |
| South | Woodland Vegetation | Upslope |
| West | Grassland Vegetation | Flat |



Legend

Subject Land

Assessment Area

100m

140m

Classified Vegetation

Grassy and Semi-Arid Woodland (including Mallee)

Grassland

Modified to non vegetated and low threat

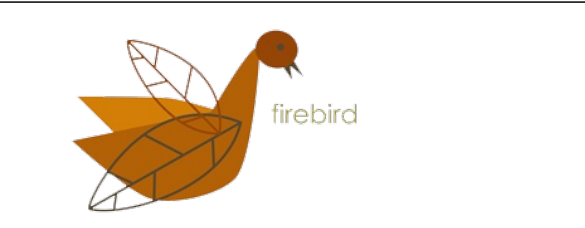
Scale 1: 10,000

0

100

200

300 Metres



Client Name: Perception Planning

Project Name: 256 Lennoxton Road, Vacy

Figure 3-1: Vegetation Map

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4 BUSHFIRE PROTECTION ASSESSMENT

4.1 Asset Protection Zones (APZ)

The PBP (RFS, 2019) guidelines has been used to determine the widths of the APZs required for habitable buildings within the site using the vegetation and slope data identified in Section 3-1 of this report.

The site lies within Dungog Local Government Area and therefore is assessed under a FDI rating of 100. Using the results from the Site Assessment (section 3-1 of this report) the deemed to satisfy APZ requirements for the proposed buildings within the site was determined using Table A1.12.2 in PBP (RFS, 2019). Refer to Table 4-1 for required APZs for the proposed habitable buildings. Figure 4-1 and Figure 4-2 APZ maps show there is ample room in the proposed allotments for the establishment of the required APZs.

Table 4-1: Recommended APZs for Future dwellings

| Proposed Lot No. (first number indicates stage) | Direction from Indicative Building Envelope | Vegetation Classification within 140m | Effective Slope (within 100m) | APZ to be Provided ¹ | Comment |
|---|---|---------------------------------------|-------------------------------|---------------------------------|--|
| Lot 201 | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 101 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |

| Proposed Lot No. (first number indicates stage) | Direction from Indicative Building Envelope | Vegetation Classification within 140m | Effective Slope (within 100m) | APZ to be Provided ¹ | Comment |
|---|---|---------------------------------------|-------------------------------|---------------------------------|--|
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 102 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 103 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 104 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |

| Proposed Lot No. (first number indicates stage) | Direction from Indicative Building Envelope | Vegetation Classification within 140m | Effective Slope (within 100m) | APZ to be Provided ¹ | Comment |
|---|---|---------------------------------------|-------------------------------|---------------------------------|--|
| Lot 105 | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 106 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 107 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |

| Proposed Lot No. (first number indicates stage) | Direction from Indicative Building Envelope | Vegetation Classification within 140m | Effective Slope (within 100m) | APZ to be Provided ¹ | Comment |
|---|---|---------------------------------------|-------------------------------|---------------------------------|--|
| Lot 108 | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 109 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 202 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 203 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |

| Proposed Lot No. (first number indicates stage) | Direction from Indicative Building Envelope | Vegetation Classification within 140m | Effective Slope (within 100m) | APZ to be Provided ¹ | Comment |
|---|---|---------------------------------------|-------------------------------|---------------------------------|--|
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 204 (existing dwelling) | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 205 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 206 | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |

| Proposed Lot No. (first number indicates stage) | Direction from Indicative Building Envelope | Vegetation Classification within 140m | Effective Slope (within 100m) | APZ to be Provided ¹ | Comment |
|---|---|---------------------------------------|-------------------------------|---------------------------------|--|
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 207 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 208 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 209 | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |

| Proposed Lot No. (first number indicates stage) | Direction from Indicative Building Envelope | Vegetation Classification within 140m | Effective Slope (within 100m) | APZ to be Provided ¹ | Comment |
|---|---|---------------------------------------|-------------------------------|---------------------------------|--|
| Lot 210 | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 211 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 212 | North | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |

| Proposed Lot No. (first number indicates stage) | Direction from Indicative Building Envelope | Vegetation Classification within 140m | Effective Slope (within 100m) | APZ to be Provided ¹ | Comment |
|---|---|---------------------------------------|-------------------------------|---------------------------------|--|
| Lot 213 | East | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 214 | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| Lot 215 | North | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | East | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | South | Grassland vegetation | Flat | 10m | Acceptable solution in accordance with PBP (RFS, 2019) |
| | West | Remnant vegetation | Flat | 11m | Acceptable solution in accordance with PBP (RFS, 2019) |

¹ APZ as per Table A1.12.2 in PBP 2019

Legend

Subject Site

Proposed Building Envelope

11m APZ

10m APZ

Buffer Watercourse

Survey Tree

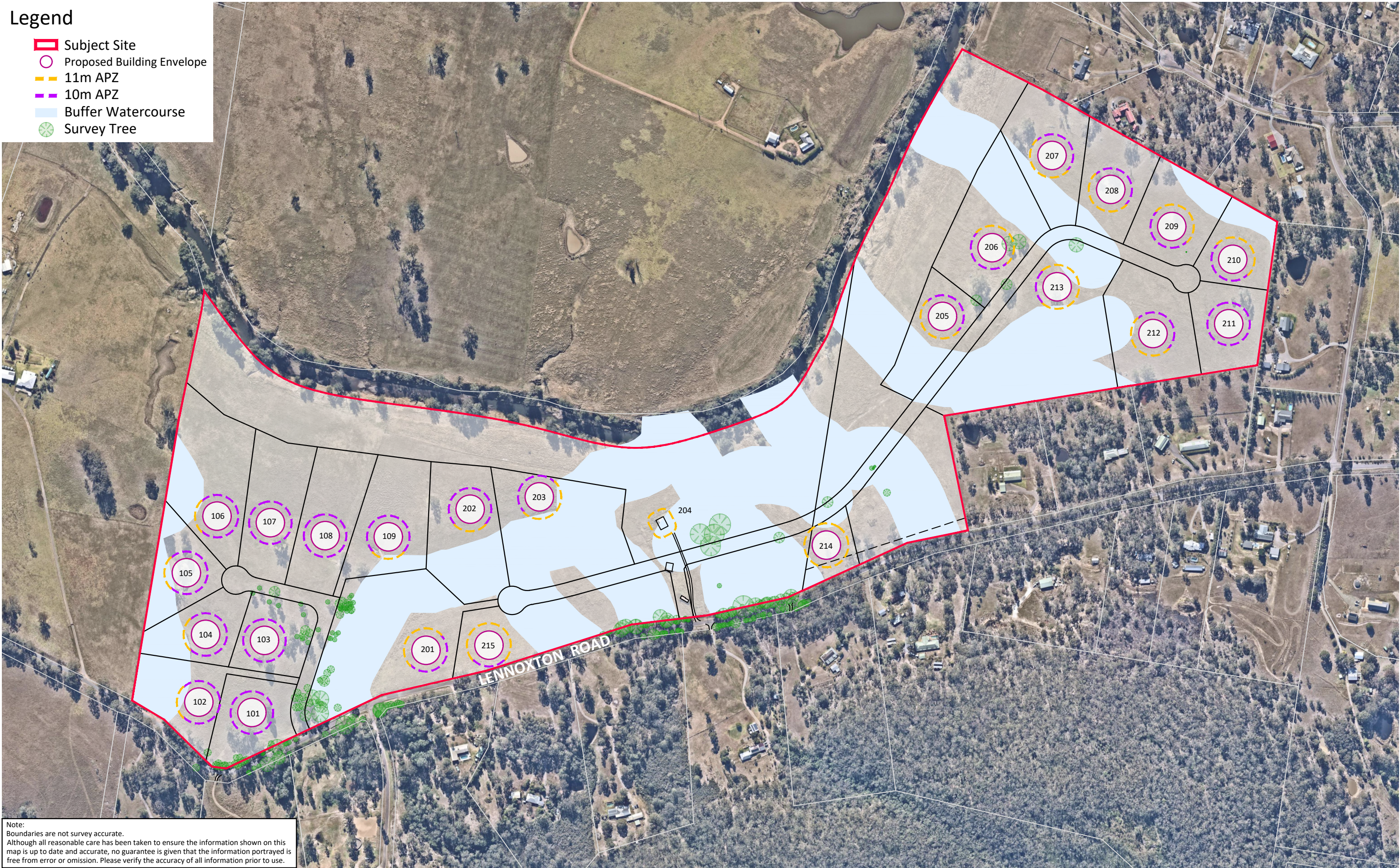


FIGURE 4-1:ASSET PROTECTION ZONES

Legend

- Subject Site
- 11m APZ
- 10m APZ
- Buffer Watercourse
- Survey Tree

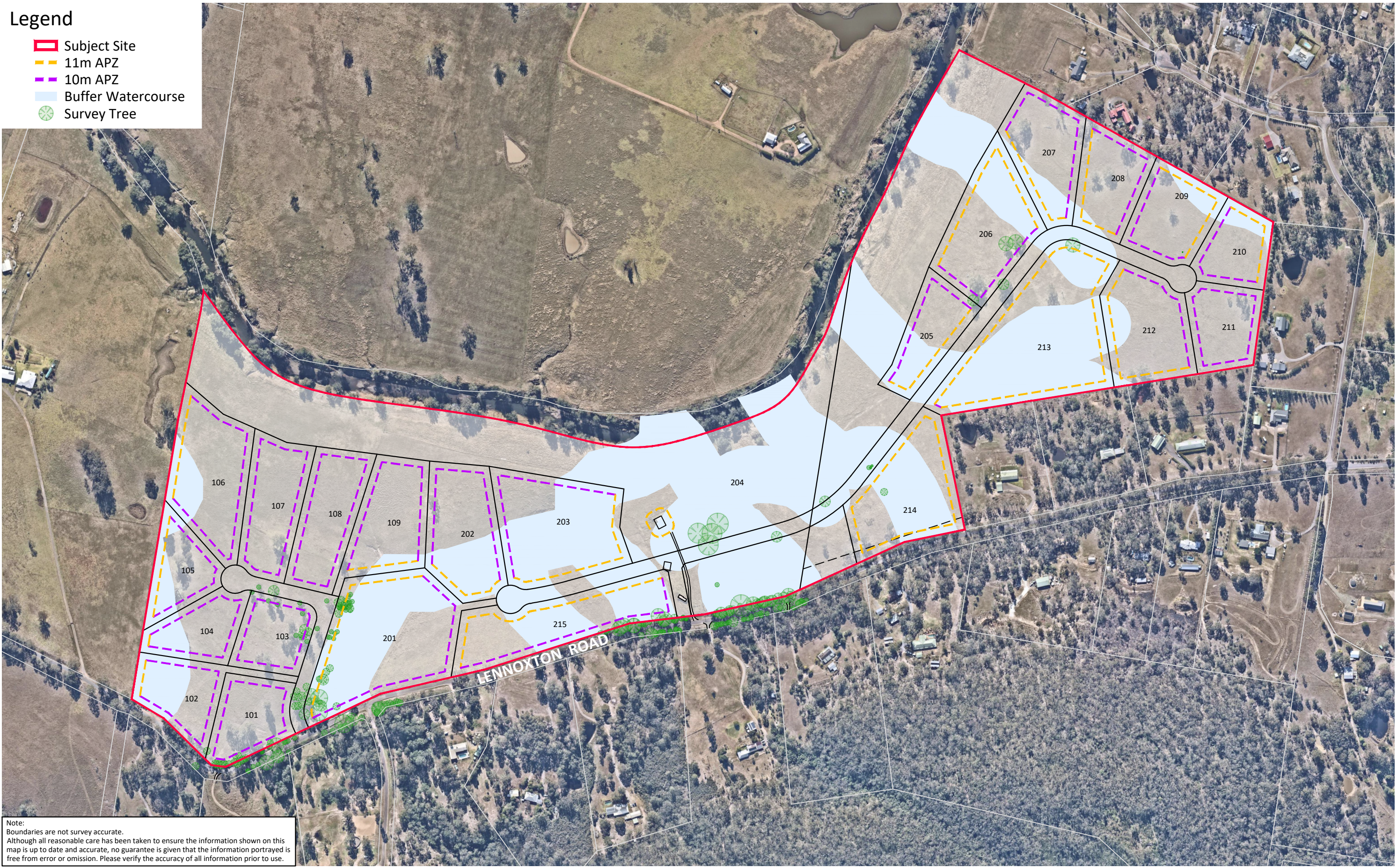
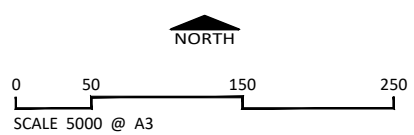


FIGURE 4-2: ASSET PROTECTION ZONES (no building envelope)

CLIENT
SITE DETAILS
DATE

Client
No.256 Lennoxton Road Vacy
22 May 2024



Firebird ecoSultants Pty Ltd
ABN - 16 105 985 993
Level 1, 146 Hunter Street, Newcastle NSW 2300
P O Box 354 Newcastle NSW 2300



DISCLAIMER
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5 DWELLING DESIGN & CONSTRUCTION

Building design and the materials used for construction of future dwellings should be chosen based on the information contained within AS3959-2018, and accordingly the designer / architect should be made aware of this recommendation. It may be necessary to have dwelling plans checked by the architect involved to ensure that the proposed dwellings meet the relevant Bushfire Attack Level (BAL) as detailed in AS3959-2018.

The determinations of the appropriate BAL are based upon parameters such as weather modelling, fire-line intensity, flame length calculations, as well as vegetation and fuel load analysis. The determination of the construction level is derived by assessing the:

- Relevant FFDI = 100
- Flame temperature
- Slope
- Vegetation classification; and
- Building location.

The following BAL, based on heat flux exposure thresholds, are used in the standard:

(a) **BAL – LOW** The risk is considered to be **VERY LOW**

There is insufficient risk to warrant any specific construction requirements but there are still some risks.

(b) **BAL – 12.5** The risk is considered to be **LOW**

There is a risk of ember attack.

The construction elements are expected to be exposed to a heat flux not greater than 12.5 k/m².

(c) **BAL – 19** The risk is considered to be **MODERATE**

There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat.

The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m².

(d) **BAL-29** The risk is considered to be **HIGH**

There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.



The construction elements are expected to be exposed to a heat flux no greater than 29 kW/m².

(e) **BAL-40** The risk is considered to be **VERY HIGH**

There is much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux no greater than 40 kW/m².

(f) **BAL-FZ** The risk is considered to be **EXTREME**

There is an extremely high risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front.

The construction elements are expected to be exposed to a heat flux greater than 40 kW/m².



5.1 Determination of Bushfire Attack Levels

Using a FFDI of 100, the information relating to vegetation, slope and according to Table A1.12.5 of PBP 2019 that determined the appropriate BAL. The results from this bush fire risk assessment are detailed below in Table 4-1–Bush Fire Attack Assessment and Figure 4-1 shows the vegetation.

Table 5-1: Determination of BALs for Future dwellings within site

| Vegetation Type | Separation Distance from vegetation | Bushfire Attack Level (BAL) | Construction Section |
|------------------------|--|------------------------------------|------------------------------|
| Grassland vegetation | <8m | BAL-FZ | Sect 3 & 8 of AS3959 |
| | >8m | BAL-40 | Sect 3 & 8 of AS3959 |
| | >10m | BAL-29 | Sect 3 & 7 of AS3959 |
| | >15m | BAL-19 | Sect 3 & 6 of AS3959 |
| | >22m | BAL-12.5 | Sect 3 & 5 of AS3959 |
| | >50m | BAL-LOW | No construction requirements |
| Remnant vegetation | <8m | BAL-FZ | Sect 3 & 8 of AS3959 |
| | 8-<11m | BAL-40 | Sect 3 & 8 of AS3959 |
| | 11-<16m | BAL-29 | Sect 3 & 7 of AS3959 |
| | 16-<23m | BAL-19 | Sect 3 & 6 of AS3959 |
| | 23-<100m | BAL-12.5 | Sect 3 & 5 of AS3959 |
| | >100m | BAL-LOW | No construction requirements |

Given the information in Table 5-1 above and APZs are installed accordingly within the lots, future dwellings will be able to comply with AS3959-2018. These will be subject to further assessment under Section 4.14 of the EP&A Act depending on location of future dwellings and retained vegetation within the site.



6 COMPLIANCE

The proposal is for a two-staged residential subdivision and therefore development standards apply. Table 5-1 details the proposed compliance with Development Standards for Residential and Rural Residential Subdivisions.

Table 6-1: Proposed Subdivision Compliance with Development Standards

| Acceptable Solutions | Performance Criteria | Compliance with Performance Criteria |
|--|---|--|
| Asset Protection Zones | | |
| › APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI. | potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m ² on each proposed lot. | Complies with Acceptable Solution – APZs for the site have been provided in accordance with A1.12.2 in PBP 2019. |
| › APZs are managed in accordance with the requirements of Appendix 4. | APZs are managed and maintained to prevent the spread of a fire towards the building. | Complies with Acceptable Solution – APZs on site are to be managed in accordance with Appendix 4 of the PBP 2019. |
| › APZs are wholly within the boundaries of the development site | the APZs is provided in perpetuity | Complies with Acceptable Solution – APZs on site occur entirely within the boundary of the site. |
| › APZs are located on lands with a slope less than 18 degrees. | APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised. | Complies with Acceptable Solution – APZs on site occur over slopes <18°. |



Landscaping

| | | |
|--|---|--|
| › landscaping is in accordance with Appendix 4; and fencing is constructed in accordance with section 7.6. | landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions. | Complies with Acceptable Solution – All landscaping within the site will meet the requirements of the acceptable solution. |
|--|---|--|

Access (General Requirements)

| | | |
|---|---|--|
| <ul style="list-style-type: none">› property access roads are two-wheel drive, all-weather roads;› perimeter roads are provided for residential subdivisions of three or more allotments;› subdivisions of three or more allotments have more than one access in and out of the development;› traffic management devices are constructed to not prohibit access by emergency services vehicles;› maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient;› all roads are through roads;› dead end roads are not recommended, but if unavoidable, are not more than 200 metres in length, incorporate a minimum 12 metres | firefighting vehicles are provided with safe, all-weather access to structures. | Complies with Performance Criteria – The site has direct access to Lennoxton Road. No perimeter roads are proposed as there is ample room within the site for any fire trucks to access future dwellings. |
|---|---|--|



| | | |
|---|--|---|
| <p>outer radius turning circle, and are clearly sign posted as a dead end;</p> <ul style="list-style-type: none"> › where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road; › where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system; and › one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression. | | |
| <ul style="list-style-type: none"> › the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ › causeways are to clearly indicate load rating. | <p>the capacity of access roads is adequate for firefighting vehicles.</p> | <p>Complies with Acceptable Solution – All roads within the site are designed to meet the requirements of the acceptable solution.</p> |
| <ul style="list-style-type: none"> › hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression; › hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning; and | <p>there is appropriate access to water supply.</p> | <p>Complies with Acceptable Solution – Future dwellings will require the relevant capacity in static water supply dedicated to firefighting purposes and compliant with the acceptable fittings.</p> |



| <ul style="list-style-type: none"> › there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available. | | |
|--|--|--|
| Perimeter Roads | | |
| <ul style="list-style-type: none"> › are two-way sealed roads; › minimum 8m carriageway width kerb to kerb; › parking is provided outside of the carriageway width; › hydrants are located clear of parking areas; › are through roads, and these are linked to the internal road system at an interval of no greater than 500m; › curves of roads have a minimum inner radius of 6m; › the maximum grade road is 15 degrees and average grade of not more than 10 degrees; › the road crossfall does not exceed 3 degrees; and › a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided. | <p>access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface.</p> | <p>Can Comply with Performance Criteria – Perimeter roads are not proposed. There is ample room within the site for any firefighting vehicles to access future dwellings and undertake firefighting operations.</p> |



Non-Perimeter Roads

| | | |
|--|---|---|
| <ul style="list-style-type: none">› minimum 5.5m carriageway width kerb to kerb;› parking is provided outside of the carriageway width;› hydrants are located clear of parking areas;› roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m;› curves of roads have a minimum inner radius of 6m;› the road crossfall does not exceed 3 degrees; and› a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided. | access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating. | Complies with Acceptable Solution – All non-perimeter roads in the site are designed and comply to meet the requirements of the acceptable solution with the exception of parking outside the carriageway width as there is ample room within the proposed lots for parking to occur. |
|--|---|---|

Property Access

| | | |
|---|---|--|
| <ul style="list-style-type: none">› There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. | firefighting vehicles can access the dwelling and exit the property safely. | Complies with Acceptable Solution – All future lots are to be connected to a public road by a driveway <70m. |
|---|---|--|



| | | |
|---|--|--|
| <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none">› minimum 4m carriageway width;› in forest, woodland and heath situations, rural property access roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay;› a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches;› provide a suitable turning area in accordance with Appendix 3;› curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress;› the minimum distance between inner and outer curves is 6m;› the crossfall is not more than 10 degrees;› maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and› a development comprising more than three dwellings has access by dedication of a road and not by right of way. <p>Note: Some short constrictions in the access may be accepted where they are not</p> | | |
|---|--|--|



| <p>less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</p> | | |
|---|--|---|
| Water Supplies | | |
| <ul style="list-style-type: none"> › reticulated water is to be provided to the development where available; › a static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed; and › static water supplies shall comply with Table 5.3d. | <p>adequate water supplies are provided for firefighting purposes.</p> | <p>Complies with Acceptable Solution – It is not expected that future dwellings will be connected to reticulated water. Each lot will instead be required to contain a water tank to hold the relevant capacity in accordance with Table 5.3d in PBP 2019.</p> |
| <ul style="list-style-type: none"> › fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005; › hydrants are not located within any road carriageway; and › reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. | <p>Water supplies are located at regular intervals; and the water supply is accessible and reliable for firefighting operations.</p> | <p>N/A – Hydrants are not existing. Static water supply is required for each residential lot.</p> |



| | | |
|---|--|--|
| <ul style="list-style-type: none"> › fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005. | flows and pressure are appropriate. | N/A – Fire hydrants are not existing. |
| <ul style="list-style-type: none"> › all above-ground water service pipes are metal, including and up to any taps; and › above-ground water storage tanks shall be of concrete or metal. | the integrity of the water supply is maintained. | Complies with Acceptable Solution – All above ground water service pipes will meet the requirements. |
| Electricity Services | | |
| <ul style="list-style-type: none"> › where practicable, electrical transmission lines are underground; › where overhead, electrical transmission <ul style="list-style-type: none"> › lines are proposed as follows: lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and › no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines. | location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings. | Can Comply with Acceptable Solution – Installation of future electricity transmission can comply with the acceptable solution. |
| Gas Services | | |
| <ul style="list-style-type: none"> › reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used; | location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings. | Can Comply with Acceptable Solution – All future dwellings are able to meet the requirements for gas services. |



| | | |
|--|--|--|
| <ul style="list-style-type: none">› all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;› connections to and from gas cylinders are metal;› polymer-sheathed flexible gas supply lines are not used; and› above-ground gas service pipes are metal, including and up to any outlets. | | |
|--|--|--|

7 CONCLUSION & RECOMMENDATIONS

In summary, a Bushfire Risk Assessment has been undertaken for a proposed two-staged residential subdivision at 256 Lennoxton Road, Vacy. The report forms part of the supporting documentation for a Development Application (DA) to be submitted to DSC.

If the recommendations contained within this report are duly considered and incorporated, it is considered that the fire hazard present is containable to a level necessary to provide an adequate level of protection to life and property on the subdivision. In summary, the following is recommended to enable the proposal to meet the relevant legislative requirements for the proposed subdivision:

- APZs have been provided in accordance with Table A1.12.2 in PBP 2019 and will occur entirely within the boundary of the proposed lots. See Chapter 4 and Figure 4-1 for APZs on proposed future habitable buildings and Figure 4-2 for APZs on proposed lots.

These distances are to be managed as described under 'Planning for Bushfire Protection (Appendix 4 – Asset Protection Zone Requirements)' and the document titled 'Standards for Asset Protection Zones'.

- Based on the APZs provided Chapter 4, we understand that future dwellings may be sited to achieve 29kW/m², which would result in BAL-29. However, all future buildings will be subject to a separate Bushfire Assessment Report (BAR) at a future point in time and so different variables (e.g., Fire Danger Index, vegetation classification, data available on slope, etc). may be used that mean the dwelling house may not be able to achieve 29kW/m².
- An assessment has identified that the primary property access road is to be:
 - i. Minimum of 4m carriageway width,
 - j. Passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m at the passing bay,
 - k. Minimum vertical clearance of 4m to any overhanging obstructions, such as tree branches,
 - l. Suitable turning head, being a loop around the dwelling,
 - m. Minimum distance between inner and outer curves is 6m,
 - n. Crossfall is not more than 10 degrees,
 - o. Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads,
 - p. Bridges and Causeways are designed sufficiently to carry a fully loaded firefighting vehicle (up to 23 tonnes) and signage is put in place to clearly indicate the maximum load rating of 23 tonnes,

Note: Some short constructions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed.

- The non-perimeter roads identified on the subdivision plan comply with the following with the exception of parking provided outside the carriageway as there is ample room on proposed lots for parking to occur:
 - › Minimum 5.5m carriageway width kerb to kerb;
 - › Hydrants are located clear of parking areas;
 - › Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m;
 - › Curves of roads have a minimum inner radius of 6m;
 - › The road crossfall does not exceed 3 degrees; and
 - › A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.
- An assessment of the existing water supply has shown that reticulated water is not connected to the subject site therefore any future dwellings will require a static water supply in accordance with Table 5.3d in PBP 2019 that complies with the following requirements:
 - › a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet;
 - › ball valve and pipes are adequate for water flow and are metal;
 - › supply pipes from tank to ball valve have the same bore size to ensure flow volume;
 - › underground tanks have an access hole of 200mm to allow tankers to refill direct from the tank;
 - › a hardened ground surface for truck access is supplied within 4m;
 - › above-ground tanks are manufactured from concrete or metal;
 - › raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959);
 - › unobstructed access can be provided at all times;
 - › underground tanks are clearly marked;
 - › tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters;
 - › all exposed water pipes external to the building are metal, including any fittings;
 - › where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and
 - › fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the relevant clauses of AS 2441:2005.



Provided the recommendations stated above are implemented in full Firebird ecoSultants Pty Ltd is of the opinion that the proposed development is able to meet the aims and objectives of PBP (RFS, 2019).



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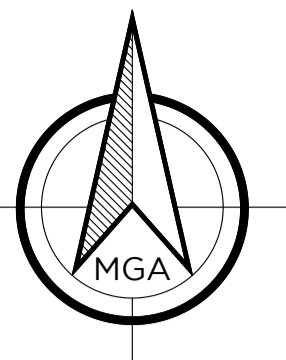
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APPENDIX A PROPOSED SITE PLANS



| REV. | DATE | AMENDMENT(S) | SUR | DFT | CHK |
|------|----------|---|-----|-----|-----|
| A | 22.04.20 | ISSUED FOR COMMENT | -- | TC | TC |
| B | 9.02.22 | ISSUED FOR COMMENT | -- | TC | TC |
| C | 2.02.24 | CONVERTED TO MGA2020, PATERSON RIVER BOUNDARY AMENDED | -- | TC | TC |
| D | 24.06.24 | STAGING PLAN ADDED, LOT NUMBERING AMENDED | -- | TC | TC |

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PROPOSED SUBDIVISION OF LOT 8
DP739338 AND LOT 94 DP788016

SITE ADDRESS:
256 LENNOXTON ROAD
VACY

CLIENT:
PETER EVANS

CAD REF: 20186_Site Plan_Rev D

1:2500

1:2500

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1:2500

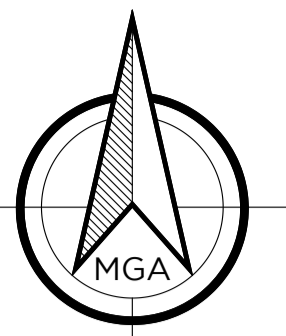
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POSITION DATUM:
ORIENTATION:
EASTING:
NORTHING:
CLASS: --
HEIGHT DATUM:
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RL: (AHD)

CORSNET
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DATE: --

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| SHEET | REV. | PROJECT No. |
| 1 of 3 | D | 20186 |



LEGEND

- PROPOSED BOUNDARY LINE
- ADJACENT BOUNDARY
- INDICATIVE BUILDING SITE
- MAPPED WATERCOURSE
- 40m WATERCOURSE BUFFER

| REV. | DATE | AMENDMENT(S) | SUR | DFT | CHK |
|------|----------|---|-----|-----|-----|
| A | 22.04.20 | ISSUED FOR COMMENT | -- | TC | TC |
| B | 9.02.22 | ISSUED FOR COMMENT | -- | TC | TC |
| C | 2.02.24 | CONVERTED TO MGA2020, PATERSON RIVER BOUNDARY AMENDED | -- | TC | TC |
| D | 24.06.24 | STAGING PLAN ADDED, LOT NUMBERING AMENDED | -- | TC | TC |

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**PROPOSED SUBDIVISION OF LOT 8
DP739338 AND LOT 94 DP788016**

SITE ADDRESS:
256 LENNOXTON ROAD
VACY

CLIENT:
PETER EVANS

CAD REF: 20186_Site Plan_Rev D



POSITION DATUM:
ORIENTATION:
EASTING:
NORTHING:
CLASS: --
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 PROPOSED BOUNDARY LINE
 ADJACENT BOUNDARY
 INDICATIVE BUILDING SITE
 STAGE 1 - 9 LOTS
 STAGE 2 - 15 LOTS

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APPENDIX B ASSET PROTECTION ZONES

APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMS, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

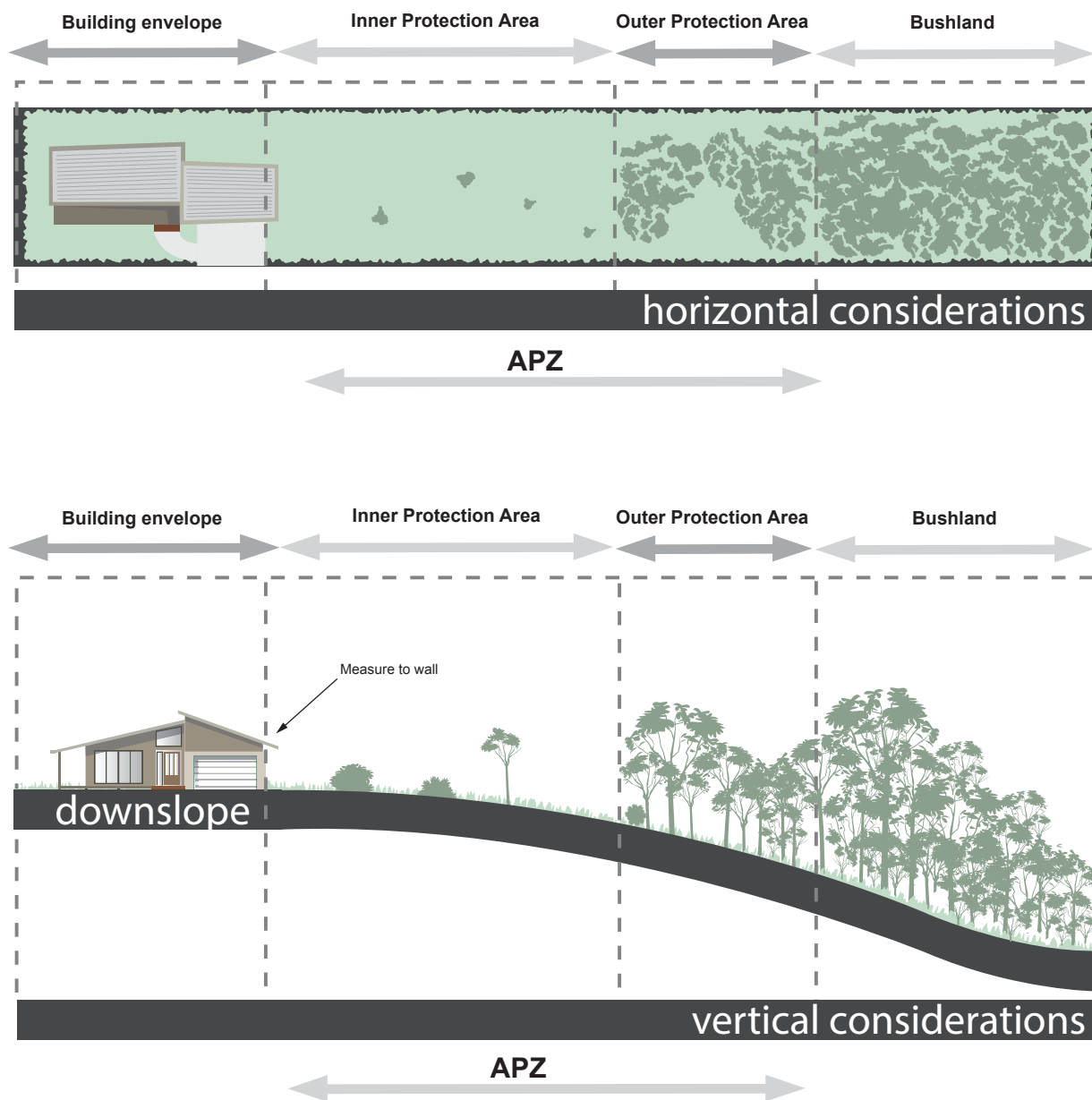
- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

Figure A4.1

Typical Inner and Outer Protection Areas.



A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defensible space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

Trees

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

Shrubs

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

Trees

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

Shrubs

- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

Grass

- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.